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RETURNING MATERIALS: Place in book drop to remove this checkout from your record. FINES will be charged if book is returned after the date stamped below. DEFINING CHARACTERISTICS OF HYPERTENSIVE CLIENTS

WHO MAKE THE MOST AND LEAST PROGRESS

TOWARD BLOOD PRESSURE CONTROL

Ву

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# A THESIS

Submitted to

Michigan State University

in partial fulfillment of the requirements

for the degree of

MASTER OF SCIENCE IN NURSING

College of Nursing

Dedication:

to Audrey Lynn

.

#### ACKNOWLEDGEMENTS

My sincere gratitude is extended to my family, classmates, and to the entire Michigan State University Graduate Nursing Faculty for their constant encouragement and support while I undertook graduate education.

The members of my thesis committee have contributed significant guidance during the completion of this project. Barbara Given, R.N., Ph. D. has been a patient mentor and source of motivation. C. W. Given, Ph. D. has enhanced my understanding of the interrelationship between critical thinking and the development of research methodology. Brigid Warren, R.N., M.S.N. has facilitated the process of developing practical clinical management strategies. Mary Nugent-Polk, R.N., M.S.N. has provided me with the encouragement to finish this manuscript.

The numerous and varied contributions of the Given and Given Research Project Team from 1977 through 1982 are sincerely appreciated. Without their diligence, the data used in this thesis would not have been available.

I am also indebted to Jack Condon, Ph. D., Robert Hymes, M.A., and Bryan Coyle, Doctoral Candidate, for statistical consultations and analyses.

This project was partially funded by a Michigan Heart Association Cardiovascular Nursing Research Grant. I express my heartfelt gratitude to the members and benefactors of the Michigan Heart Association for

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reducing cardiovascular morbidity and mortality.

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#### ABSTRACT

# DEFINING CHARACTERISTICS OF HYPERTENSIVE CLIENTS WHO MAKE THE MOST AND LEAST PROGRESS TOWARD BLOOD PRESSURE CONTROL

By

#### Beth Ann Krauskopf

A quasi-experimental study of 55 hypertensives in primary care was undertaken to determine the characteristics of hypertensives who achieved the most and least reduction in diastolic blood pressure during an experimental nursing intervention. The possible differentiating variables included: sociodemographics, disease duration, health perceptions, knowledge of disease and therapeutic regimen, and medication, dietary, and exercise compliance. Interviews and selfadministered questionnaires provided the data for the project. In tests of single hypothesis using chi square or t-tests, age and exercise compliance rates were significantly (p < .05) and directly related to blood pressure control. A multiple regression analysis identified the set of four significant predictor variables which accounted for maximal intergroup variance: education, exercise compliance, occupation, and family income. These findings could provide a basis for establishing future psychosocial profiles of those hypertensives at risk for unfavorable treatment outcomes.

#### CHAPTER I

#### THE PROBLEM

#### Introduction

The purpose of this study was to describe the relationships among some of the contributions that hypertensive clients in primary care settings make toward their own care. More specifically, the focus was on those hypertensive clients making the most and the least progress toward blood pressure control to determine which client contributions may have differentiated between these two groups. Portions of the data collected by B. Given and C. W. Given in their research project <u>Patient</u> <u>Contributions to Care: Link to Process and Outcome</u> (5ROINU0062, 1977-1982) were utilized for this research.

An introduction to the research problem, the problem statement, hypotheses, conceptual definitions, and the assumptions and limitations of the study are presented in this first chapter.

#### The Problem

A major problem in treating chronically ill clients is poor compliance with the recommended therapeutic regimen. This presents a particularly difficult challenge in treating hypertension since only about fifty percent of hypertensive clients comply with their physicians' recommendations for taking medications, altering dietary habits, and keeping appointments (Webb, 1980). The problem is more pronounced among asymptomatic clients than those with symptoms (Daniels

and Kochar, 1979). The benefits of therapy cannot be achieved unless the client makes an affirmative decision to contribute to his own care (Finnerty, 1974). Client contributions to care may include the possession of appropriate health perceptions, knowledge of disease and the therapeutic regimen, and compliance behaviors (Given, 1977).

The contributions which the client makes represents the link between the process of care rendered by health care providers and the client's attainment of desired health outcomes. The client's cognitive, perceptual, and behavioral capacities set the boundaries within which a personal compliance decision is made. Thus, clients who have accurate knowledge and appropriate perceptions of their disease and therapy are more likely to comply with the prescribed regimen and attain the desired health outcomes (Given, 1977).

Until recently, little was known about the contributions that the chronically ill make toward their own health care. Previous research focused on the provider and attempted to clarify ambiguous theoretical relationships rather than on the client and clinically useful intervention strategies.

The purpose of this study was to differentiate between those hypertensive clients who achieve the greatest and the least reduction in their diastolic blood pressures on the basis of their knowledge, health perceptions, and reported compliance to medications, diet, and exercise. These findings are useful in clinical practice by contributing to the development of diagnostic categories of hypertensive clients with whom the Clinical Nurse Specialist can be expected to effectively intervene using the Given nursing intervention model (1981).

# Statement of the Problem

This study was undertaken to describe the relationships among some of the contributions that hypertensive clients in primary care settings make toward their own care. Specifically, the problem is: <u>Do differ-</u> <u>ences exist in hypertensive subjects who are the most and least success-</u> <u>ful in making progress toward blood pressure control after an experimen-</u> <u>tal nursing intervention with regard to the relationship among their</u> <u>health perceptions, their knowledge of disease and the therapeutic regi-</u> <u>men, and stated compliance with that regimen?</u>

# Definitions of Concepts

The following concepts were operationally defined by Given and Given, Co-Principal Investigators in <u>Patient Contributions to Care</u>: <u>Link to Process and Outcome</u> (1977-1982). These investigators developed the measurement instruments used in this study, making it appropriate to use their conceptual definitions. The following section contains the definitions of terms used in the problem statement.

#### Health Perceptions

Health perceptions are defined as the client's expressed beliefs and attitudes about the severity of disease, the benefits of treatment and continuing care, and the barriers to carrying out the prescribed plan of care. Perceptions of <u>Severity of Disease</u> are the expressed beliefs and attitudes of the client concerning the effect of the condition upon present and future health states. Perceptions of <u>Benefits</u> are the expressed beliefs and attitudes of the client regarding the probability that the therapeutic regimen will enable s/he to avoid or control the consequences of hypertension. Perceptions of <u>Barriers</u> are the expressed beliefs and attitudes of the client concerning his/her ability

to undertake aspects of the therapeutic regimen (Given and Given, 1979). <u>Knowledge of Disease and the Therapeutic Regimen</u>

Client knowledge of disease is the factual information recalled and reported in response to questions concerning symptoms, etiology, course of illness, prognosis, and possible complications or symptoms of disease. Client knowledge of the therapeutic regimen is the factual information recalled and reported in response to specific questions concerning medications (name, purpose, dosages, expected results, precautions, and possible side effects); diet (purpose, acceptable/unacceptable foods, levels of caloric intake); behavioral modifications (smoking, alcohol, rest and exercise); and prescribed follow-up visits (Given and Given, 1979).

# Stated Compliance with Therapeutic Regimen

Stated compliance with the therapeutic regimen is defined as the extent to which the client states s/he is carrying out the therapeutic recommendations of health care providers concerning prescribed medications, diet, and behavior modification in exercise.

#### Hypertensive Clients

Hypertensive clients are those adults eighteen to sixty-five years of age who are being treated in a primary care setting for diagnosed essential hypertension, who are literate, and are on a prescribed diet or medication regimen. Excluded hypertensives include those with diagnosed disease (i.e., cancer, end-stage renal disease, blindness, psychosis or present treatment for a psychiatric problem, pregnancy (or lactation), or stroke) other than that resulting from hypertension itself, of the target organs (Given, 1977). By excluding these subjects, the assessment of target organ involvement conducted in the

Givens' study should reflect only hypertensive changes. Finally, hypertensive clients had to have had either a systolic pressure of 160 mm Hg. or above or a diastolic pressure of 95 mm Hg. or above on more than one occasion.

The following definitions of success were formulated after consulting the research literature by Hamilton, Thompson, and Wisniewski (1964); Kannel, Gordon, and Schwartz (1971); Lew (1973); Kannel (1974); Kannel, McGee, and Gordon (1976); Taguchi and Fries (1974); Kaplan (1978); Krishan (1979); Levy (1979a, 1979b); Dove and Schneider (1980); Morisky et al., (1980); and, Cunningham and Hill (1982).

#### Most Successful Clients

Hypertensive clients who are the most successful in making progress toward blood pressure control are defined as those for whom the <u>greatest</u> <u>reduction</u> in the mean supine diastolic blood pressure was achieved at the final nursing intervention session attended. (See Appendix A)

#### Least Successful Clients

Hypertensive clients who are the least successful in making progress toward blood pressure control are defined as those for whom the <u>least</u> <u>reduction</u> in the mean supine diastolic blood pressure was achieved at at the final nursing intervention session attended. (See Appendix A) Progress in Blood Pressure Control

Progress in blood pressure control is defined as the movement of the client's supine auscultory blood pressure measurements toward the blood pressure control goal of  $\frac{140 \text{ mm Hg.}}{90 \text{ mm Hg.}}$  as specified by the American Heart Association.

#### Hypotheses

Given the hypertensive subjects who are the most and least successful in making progress toward blood pressure control after an experimental nursing intervention:

- It is not possible to differentiate between the two groups of subjects on the basis of <u>demographic characteristics</u> (age, sex, race, income, education, and occupation) and <u>duration of disease</u>.
- 2. It is not possible to differentiate between the two groups of subjects on the basis of the actual <u>number of symptoms</u> <u>reported</u> and the <u>perceived mean severity</u> of hypertensive symptoms at intake into the study.
- 3. It is not possible to differentiate between the two groups of subjects on the basis of the actual <u>number of symptoms</u> <u>reported</u> and the <u>perceived mean severity</u> of hypertensive symptoms at the sixth month interview.
- 4. It is not possible to differentiate between the two groups of subjects on the basis of the <u>expressed benefits and</u> <u>barriers</u> to following the therapeutic medication and diet regimens at intake into the study.
- 5. It is not possible to differentiate between the two groups of subjects on the basis of the <u>expressed benefits and</u> <u>barriers</u> to following the therapeutic medication and diet regimens at the sixth month interview.
- It is not possible to differentiate between the two groups of subjects on the basis of their <u>overall knowledge</u> scores at intake into the study.

- 7. It is not possible to differentiate between the two groups of subjects on the basis of their <u>overall knowledge</u> scores at the sixth month interview.
- 8. It is not possible to differentiate between the two groups of subjects on the basis of <u>self-reported</u> <u>compliance</u> rates for medication taking, diet, and exercise in nursing intervention sessions I, III, IV, V, VI, and VII.

#### Assumptions and Limitations

#### Assumptions

The following assumptions relate to the conceptual framework, study population, and variables to be researched.

- People are goal directed beings who will undertake action to prevent illness or respond to symptoms, and who are willing to follow professional recommendations to control chronic diseases (King, 1981; Rosenstock, 1974; and Given and Given, 1982).
- 2. Health perceptions, knowledge, and compliance are measurable constructs (Given and Given, 1982).
- 3. The client interview is a useful approach in assessing compliance with antihypertensive therapy (Haynes et al., 1980).
- 4. Progress in blood pressure control is a clinically useful outcome since even a partial reduction of blood pressure may prevent long term hypertensive complications (Taguchi and Fries, 1974; Johnston et al., 1980).
- Blood pressure measurement is the single most useful factor for detecting persons at high risk for cardiovascular diseases (Kannel, McGee, and Gordon, 1976).

- 6. Clinical blood pressure measurements adequately discriminate between those clients making the most and the least progress in achieving blood pressure control (Kannel, 1974; Kannel, McGee, and Gordon, 1976; and Johnston et al., 1980).
- Studying the exceptional cases has practiacal implications for working with the more typical cases (Rosenstock, 1974).

# Limitations

The following limitations relate to the conceptual framework, study population, instruments, research design, and statistical analysis of the data.

- The conceptual framework may have greater applicability to middle socioeconomic groups than to lower status groups since the possession of health beliefs implies an orientation toward the future, toward deliberate health planning, and toward deferment of immediate gratification in the interest of long term health care goals (Rosenstock, 1974).
- The concept disease severity cannot be operationalized according to target organ involvement due to missing medical assessment data.
- 3. Clients selected for this study sought care in family practice settings, possibly indicating they were from a lower socioeconomic status than clients seeking care from private physicians (Given and Given, 1982).
- 4. Clients selected for study may not have been concerned about achieving higher levels of health (Given and Given, 1982).
- 5. Clients receiving care in family practice centers may not have had as severe hypertension as those receiving care from

specialty physicians (Given and Given, 1982).

- 6. Clients selected for this study do not represent the variety of sociodemographic characteristics necessary for conducting optimum research on compliance (Schulman et al., 1982).
- 7. Client progress in achieving blood pressure control may be more related to disease severity than to client response to the experimental treatment (Hutchinson, 1969; Akpom, 1973).
- The instruments developed for use in this study may not accurately measure the complexity of the constructs (Rosenstock, 1974; Given and Given, 1982).
- 9. The research staff was unable to control site specific factors which may have affected the clients' beliefs and knowledge during the six-month experimental intervention (Given and Given, 1982).
- 10. The integrity of the Givens' experimental design may have been compromised by the fact that not all pre- and post test measures could be taken at identical time intervals due to difficulties the interviewers experienced in scheduling client interviews (Given and Given, 1982).
- 11. The method for classification of clients into the two study groups may have allowed for erroneous subject assignment since one sole criterion, diastolic blood pressure, was used to determine group assignment (Klecka, 1975).
- 12. Repeated diastolic blood pressure measurements may be insufficient to differentiate those subjects making the most and least progress toward blood pressure control since repeated measurements will inevitably produce random variation whereby

extreme values regress toward the mean of the full population (Remington and Schork, 1970).

- 13. Data analyzed may be of a restricted range due to the fact that experimental subjects may have given socially desirable responses or may be representative of a group of more compliant clients due to volunteer participation and the attrition of less compliant clients (Given and Given, 1982).
- 14. Data summarization procedures may have obscured intergroup differences on the study variables.
- 15. The predictive study findings are dependent upon the set of defining characteristics selected for statistical analysis. The actual findings could have been quite different if the Givens' three additional belief dimensions had been selected for study (Klecka, 1975).
- 16. The pre-intervention diastolic blood pressure measurements for each study group were significantly different  $(p \le .05)$ .

# Overview of the Chapters

This research is presented in its entirety in six chapters. An introduction, a statement of the problem, definitions of concepts, hypotheses, and the assumptions and limitations of this study were presented in this first chapter.

In Chapter II the conceptual framework is presented as it relates to King's (1981) theory for nursing with selected concepts from the health belief model.

In Chapter III a review of the literature pertinent to this research is presented.

In Chapter IV the research design, methodology, and procedures

utilized in this study are described.

In Chapter V a description of the data and data analysis procedures are given.

In Chapter VI a brief summary of the nursing implications of this study is presented.

# CHAPTER II

#### CONCEPTUAL FRAMEWORK

The framework presented in this chapter includes a discussion of three models: nursing theory as presented by King (1981); the health belief model as explained by Rosenstock (1974), Kirscht (1974), and Becker (1974); and, the proposed critical outcome behaviors for blood pressure control established by the National High Blood Pressure Education Program (1980).

A brief review of the literature is presented after the discussion on the health belief model to describe the relationships among the study concepts (health perceptions, knowledge of the therapeutic regimen, and stated compliance with that regimen). Lastly, these concepts will be related to nursing practice and research.

# Statement of the Problem

The purpose of this study is to describe the relationships among selected contributions that hypertensive clients in primary care settings make toward their own care. Specifically, the problem is: <u>Do</u> <u>differences exist in hypertensive subjects who are the most and</u> <u>least successful in making progress toward blood pressure control after</u> <u>an experimental nursing intervention with regard to the relationship</u> <u>among their health perceptions, their knowledge of disease and the</u> <u>therapeutic regimen, and stated compliance with that regimen</u>?

A discussion of the three conceptual models follows.

### Conceptual Framework

Nursing theory as presented by King (1981), the health telief model (Rosenstock, 1974; Kirscht, 1974; Becker, 1974), and the proposed critical outcome behaviors for blood pressure control (National High Blood Pressure Education Program, 1980) are selected for this study's conceptual framework since no single theory or model fully explains compliance behavior.

#### Nursing Theory as Presented by Imogene King

King summarizes her book, <u>A Theory for Nursing</u> (1981) in a "theory of goal attainment." King suggests that it is primarily in the interpersonal system, where at least two people interact, that the goal of maintaining or attaining a desired state of health is achieved. This interpersonal system brings together the personal system of "man" and his environment, a social system.

The nature of this purposeful client--nurse interaction involves the mutually agreed upon means to explore, establish, and achieve goals. Mutuality is based upon the client's active participation in sharing concerns, problems, health disturbances, and personal perceptions with the nurse who will use the nursing process to help the client attain appropriate goals.

Before defining the major concepts in the theory of goal attainment, the concepts of man and environment will be clarified. According to King, <u>man</u> lives in his own "personal world" as determined by his/her experiences in the interpersonal and social systems. Man responds to other people, objects, or events in life according to the concepts of perception, self, growth and development, body image, time, and space.

Perception is each person's viewpoint of reality as based on

sensory input, intellectual thoughts, past experiences, one's self-concept, genetic inheritance, education and socioeconomic status. Individuals differ in what they select to be part of their perceptual world. What one knows influences perception, which in turn influences learning.

The concept of self is the combination of the ideas and values which are built upon perceptions. Man perceives himself according to the way s/he perceives others perceive him/her. Man is a dynamic goal-oriented individual striving to avoid inconsistencies in his/her values and beliefs.

Growth and development include a systematic patterning of biological and behavioral changes, which can be influences by other persons and the environment. It is the process of growth and development that helps individuals move toward self-actualization.

Body image is the conscious and unconscious perceptions about one's body and others reaction to that physical appearance. As experiences and perceptions change throughout life, one's body image also changes.

Time is the sequence and duration of events, an experience perceived to pass at varying rates according to the event. It is unidirectional, giving unity and rhythmic ordering to the environment. "Space is defined as the physical area called territory and by the behavior of individuals occupying space" (p. 38).

In summary, man is a dynamic being in continuous interaction with the environment. This interaction shapes man's perceptions, which in turn influence his/her behavior and interaction with an open system, and helps him/her to stay healthy by assisting him/her to cope with interferences in that system.

Man's environment is comprised of the social systems within which

s/he interacts. The family, religious, educational, work, and peer groups influence man's growth and development, and provide the rules that shape his/her roles, status, relationships, and decisions. Effective nurses assess the social systems affecting clients to obtain a broad data base for making clinical judgments.

King's theory of goal attainment was selected because it integrates concepts of interaction, perception, communication, transaction, role, stress, and growth and development. These concepts are the assumptions implied in the conceptual model's arrow labeled transaction. (See Figure 2) Furthermore, this theory defines the process of interaction between the client and nurse, a variable previously cited as possibly having a significant impact upon compliance behaviors of hypertensives. This interaction process is comparable to the nursing process.

<u>Interaction</u> is defined as a process of perception and communication between people and the environment. Interaction implies that each person in the encounter brings different knowledge, needs, goals, past experiences, and perceptions to the situation. The uniqueness of the individual affects the judgments to be made about the other person, the situation itself, and ultimately any decisions that are made during the interaction.

Perceptions related to goal attainment include the previously described perceptions of man and the processing of information available in the immediate environment.

<u>Communication</u> is the verbal and nonverbal information content of the interaction which helps to establish the mutual bond between the client and nurse. It is the means of assessing concerns and sharing information that will assist each other in making goal directed

decisions.

<u>Transaction</u> involves bargaining, negotiating, and sharing one's frame of reference to identify commonalities among people. The value of an interaction can be determined by assessing the attainment of mutually set goals, the outcome of transaction.

<u>Role</u> is a set of rights and obligations expected of persons in a particular position or situation. Role expectations influence the process of transaction while role conflict and confusion decrease the probability of goal achievement and create stress.

<u>Stress</u> results from interacting with the environment to maintain a balance of growth, development, and performance. As stress increases, an individual's perceptions narrow and their decisions become less rational. Stress may lead to decreased interactions and impaired goal attainment. The concepts of growth and development, time, and space are not used differently in the goal attainment theory.

The <u>Theory of Goal Attainment</u> provides a framework for acknowledging the complexity and potentiality of man, a perceiving, thinking, feeling being. S/he is capable of choosing between alternatives, setting goals, and selecting the means to achieve those goals (George, 1980).

The concepts in the theory of goal attainment provide the nurse with guidelines for assessing the client's self-expectations and the expectations of significant others. Together, the client and nurse set goals, establish the most appropriate means to attain those goals, and then implement their plans. Transaction occurs when both the client and the nurse mutually work toward goal achievement, constantly evaluating their progress.



King's Theoretical Concepts Operationalized Statements

In this study's conceptual model, it is mandatory for the client and primary health care provider to achieve a state of transaction. The client must be an equal partner in health decisions, if the plan is to be compatible with his/her life style and needs. The client must be prepared to not only implement the plan, but to monitor progress in controlling hypertension. When barriers to problems arise that the client cannot resolve alone, the client must return to the provider to mutually resolve the problem before an alteration in health occurs. (See Figure 2)

This study's conceptual model also implies that the client-provider interaction consists of multiple decision making points. The interaction model in Figure 1, based on King's (1981) "A Process of Human Interaction," clarifies the communication process through the operationalization of the King concepts.

In an attempt to clarify King's communication process, the overall communication process is separated into two phases in Figure 1: the intrapersonal and interpersonal (King, 1981). The intrapersonal phase consists of those skills which an individual uses to communicate with him/herself. Intrapersonal skills help a person to develop an understanding of his/her own behavior, cope with the circumstances of life, and control situations in which s/he may find his/herself. Successful completion of this phase of the communication process is critical to an individual if s/he is to set rational goals and meet those goals.

As a person develops the ability to identify personal feelings, s/he begins to recognize that others share those same feelings, frustrations, and challenges. It is in this interpersonal phase of the communication process that an individual learns that s/he needs to

Conceptual Model



Improved Health State

control his/her own behavior. This is probably accomplished through sharing, empathy, cooperation, and negotiation (Glenn and Warner, 1982).

At the initiation of communication, each party enters an interaction with individualized perceptions or views and unique past experiences. These intrapersonal views result in a judgment being made about the feasibility of initiating verbal and nonverbal communication in that situation. As a result of this judgment or decision, some physical or mental action is undertaken to withdraw from or proceed with the encounter. Finally, each party reacts according to how s/he views the other person and his/her own past life experiences.

The second phase of the communication process consists of the interpersonal interaction, transaction, and feedback. The actual exchange of information occurs in the interaction, which in turn leads into a sharing of values or beliefs during transaction. Feedback about the progresss of the interaction in facilitating goal achievement behaviors is internalized by each party and thus leads to alterations in future interactions and transactions.

In summary, the process of the client-provider interaction involves two phases. In the first phase, each party makes multiple intrapersonal decisions about their ideas and feelings which are not observable and not measurable. The second phase of the interaction involves multiple observable and measurable interpersonal behaviors. The variables contained in this thesis are those measurable interpersonal components of the communication process as seen in Figure 2.

King's theory for nursing provides a framework for understanding the process of goal attainment as implemented during the experimental nursing intervention as designed by Given (1981). The health belief

model provides additional guidance for understanding the interpersonal components of the communication process and clarifying their relationship to health related decisions.

# Health Belief Model

The health belief model is a psychosocial motivational model developed in the early 1950's to explain health related decision making. The health belief model depicts man as a cognitive being and proposes that the likelihood a given health behavior will occur is determined by the client's psychological state of readiness to take that action and by the individual's subjective beliefs, values, and opinions about the benefits and barriers involved in undertaking this behavior (Mikhail, 1981). Recent research by Given and Given (1982) suggests that the concepts of benefits and barriers are not two separate concepts, but are components of the client's commitment to undertaking an overt health behavior. An individual's psychological state of readiness is determined by the perceived susceptibility to that condition and to the perceived severity of the consequences of that condition (Mikhail, 1981). According to Rosenstock (1974), the health threat or those perceptions of disease susceptibility and severity, provide the energy or motivation for the individual to undertake a health action. The strength of his/her commitment to the therapeutic regimen determines the direction of that individual's health behavior.

It is proposed that a stimulus or cue to action must take place to initiate the desired health behavior. This cue may be of internal origin, such as perceived symptoms, or may be derived from an external source, like the client-provider interaction. The intensity of a cue must be sufficient to move the client into a state of psychological

readiness to recognize a health threat exists and identify the need for taking some action to reduce the anxiety associated with that health threat (Becker, 1974; Friedman, 1981; Mikhail, 1981).

The health beliefs are conditioned or shaped by a group of modifying and enabling factors. These factors include: (1) demographic factors; (2) the complexity, longevity, and disruption of the regimen to customary activities; (3) attitudes, such as satisfaction with health care services; (4) the client-provider interaction; and (5) social support or pressures (Rosenstock, 1974; Mikhail, 1981; Given and Given, 1982).

Becker et al. (1974) introduced the concept of motivation into the health belief model. Health motivation is defined as the degree of an individual's interest in and concern about health matters. Research literature also implies that the willingness to seek out, accept, and comply with positive health practices and the prescribed therapy is inherent in motivation (Dracup and Meleis, 1982). Caplan (1979) suggests that motivation is the link between perceived health needs and the initiation of behavioral responses to meet that need.

Caplan (1979) suggests that motivation consists of three major components: (1) possession of the self-confidence and resources necessary for correct behavioral performance; (2) the belief that the prescribed behavior will lead to a specific outcome; and (3) the attractiveness of that outcome. The health care provider should intervene on the appropriate motivational component to enhance the client's motivation and avoid misunderstanding and friction in the client-provider interaction.

In summary, the health belief model proposes that an individual's

cooperation with the therapeutic regimen depends on the extent to which that person perceives that s/he is susceptible to the disease; that the disease is serious; that the treatment is efficacious; and that the barriers to carrying out the regimen are possible to overcome (Haynes et al., 1982). An individual becomes effectively motivated if s/he believes a particular health action would be effective in avoiding illness (Cummings, Becker, and Maile, 1982).

The study variables, as derived from the conceptual model in Figure 2, are representative of those belief modifying factors (sociodemographic factors, duration of hypertension, and knowledge of disease and therapy); the motivational factors (commitment to following the dietary and medication regimens and compliance with the therapeutic regimen); and cues to action (perceived number and severity of symptoms). The design of this study is intended to determine if a combination of health belief model concepts is related to blood pressure control among a select group of hypertensive clients.

The conceptual definitions and a brief review of the literature on the problem statement's concepts follow. All conceptual definitions were derived from published works by the health belief model's criginators (Becker, 1974; Rosenstock, 1974; Kirscht, 1974). The conceptual definitions are consistent with those used by Given and Given (1977-1982).

### Demographic Characteristics

In the original health telief model by Rosenstock modifying factors were included. The demographic characteristics comprised a portion of these modifying factors. Six background characteristics comprise the demographic characteristics: age, sex, race, income, education, and

occupation. Age, race, and sex are related to the prevalence and severity of hypertension (Stamler et al., 1974). Research by Wagner, Warner, and Slome (1980) is suggestive that hypertensives represent greater percentages of men, blacks, individuals over fifty years of age, and of less formal education than do normotensive groups. Differences in sex, age, race, and education seem to be more pronounced for moderately severe hypertensives than for mild hypertensives (Wagner et al., 1980). Syme et al. (1974) suggests that a lower social class position may be more indicative of the prevalence of hypertension than race. Syme et al. report that blacks and whites in lower social class groups have the highest blood pressures within racial categories. Caldwell et al. (1970) also suggest that a relationship exists among lower social class position, noncompliance, and more severe disease states.

Research over the past twenty years has failed to demonstrate any consistent significant association between demographic characteristics and compliance with the therapeutic regimen (Hulka, Kupper, Cassel, and Efird, 1975; Sackett and Haynes, 1976; Becker et al., 1977; Rudd et al., 1979; Cooper, Love, and Raffoul, 1982). Sociodemographic factors would appear to have a greater impact upon health motivations and perceptions (Becker et al., 1977), clinic participation rates (Apostolides et al., 1978; Verbrugge, 1980; Shulman et al., 1982), the frequency of hypertensive complications (Caldwell et al., 1970), and the prevalence and severity of hypertension (Caldwell et al., 1970; Stamler et al., 1974; Given, 1977; Wagner, Warner, and Slome, 1980).
## Duration of Hypertension

The duration of hypertension is defined as the length of time since hypertension was first diagnosed. Since the natural history of hypertension tends to be one of insidious damage that is most often clinically silent for a decade or more, the emergence of signs and symptoms of target organ involvement probably coincides with the diagnostic labeling (Goroll, May, and Mulley, 1981).

The duration of hypertension is assumed to be reflective of disease severity since a longer duration of disease is associated with a higher probability of severe disease (Goroll, May, and Mulley, 1981) as based on the findings of the Veterans Administration Cooperative Study Group (1970 and 1972). A group of 143 hypertensive veterans with diastolic blood pressures ranging between 115 and 129 mm Hg. and a mean duration of disease of five years were assigned to either pharmacologic or placebo treatment. Twenty-seven severe complications developed in the placebo treated group resulting in the deaths of four subjects. Two veterans receiving pharmacologic treatment developed severe complications without mortality. The relationship between morbidity and mortality among treated hypertensives with varying durations of disease is not evident in the research literature.

A literature review by Haynes, Taylor, and Sackett (1979) and studies by Caldwell (1970) and Haynes (1980) purport that compliance to treatment decreases with the passage of time. Caldwell et al. (1970) report a significant association ( $p \leq .01$ ) between the duration of hypertension and continuation of hypertensive therapy for seventy-six Detroit subjects. Sixty-three percent of those hypertensives remaining in therapy at least five years had diagnosed hypertension for at least

ten years while forty-two percent of those who dropped out of therapy had hypertension less than ten years. Haynes et al. (1982) report that fifty percent of new hypertensives drop out of care during the first year of treatment. Caldwell et al. (1970) report that thirty-one percent of those hypertensives who dropped out of therapy had known disease for less than five years, while only five percent of those who remained in therapy had hypertension less than five years. Caldwell et al. (1970) suggest that hypertensives with a short acquaintenance with disease are more likely to drop out of therapy in the first year while those with a longer duration of disease are more likely to remain in treatment.

In summary, the duration of hypertension is associated with long term treatment among persons with diagnosed disease of approximately ten years duration. The relationship between the duration of hypertension and disease severity is not clearly evident in the body of research literature.

#### Health Perceptions

Health perceptions are defined as the client's expressed benefits and attitudes about the severity of disease, the benefits of treatment and continuing care, and the barriers to carrying out the prescribed plan of care (Rosenstock, 1974). According to Rosenstock, health perceptions or beliefs are categorized into perceived susceptibility, perceived seriousness, perceived benefits of taking action, and perceived barriers to taking health actions. The perceptions of disease susceptibility and severity provide energy for the client to take health actions. The perceived benefits and the perceived barriers to health care provide the direction that the client's behavior will take.

According to the health belief model, when an individual recognizes personal susceptibility, appropriate behaviors will not occur unless s/he also believes that the illness will bring serious organic and/or social repercussions. Perceptions of disease severity are defined as the expressed beliefs and attitudes of the client concerning the effect of the condition upon present and future health states (Rosenstock, 1974). Becker (1974) includes severity as a basic element of compliance behavior.

<u>Perceptions of disease severity</u> are defined as the expressed beliefs and attitudes of the client concerning the effect of the condition or disease upon present and future health states.

In 1975 Becker first suggested that the relationship between perceived severity of disease and compliance behaviors may be curvilinear. In other words, low levels of perceived disease severity may not be sufficiently motivating to obtain compliance while extremely high levels of perceived severity may produce fearfulness and inhibit compliance behavior. Between these two extremes of the perceived severity of disease, the beliefs concerning disease severity appear to have a positive influence on client compliance. The perceived seriousness of disease was positively related to client compliance behaviors in seven of nine studies reviewed in 1979 by Haynes.

In a literature review by Mikhail on the health belief model research published from 1959-1979, Mikhail (1981) supports the Becker and Haynes conclusion. In addition, Mikhail suggests that low compliance rates at each end of the perceived severity continuum may be related to the provider's failure to disseminate specific coping strategies to the client which would facilitate the selection of appropriate health

behaviors. If the provider does not offer the client ways to cope with their perceived health threat or disease, the individual may use the defense mechanism of denial to avoid anxiety about and become noncompliant with prescribed therapy.

The literature is not clear as to the coping behaviors which may decrease the perceived health threat. Tagliacozzo et al. (1974) report that education and counseling a variety of chronically ill clients in regard to the treatment regimen, their disease, and barriers and benefits to compliance, did not change their self-assessment of disease severity.

<u>Perceptions of benefits</u> are the expressed beliefs and attitudes of the client regarding the probability that the therapeutic regimen will enable s/he to avoid or control the consequences of disease. An individual is more likely to take those actions which s/he believes would be beneficial in reducing the susceptibility to and/or the severity of the condition (Becker, 1974; Cummings, Becker, and Maile, 1980).

Perceived benefits of therapy seem to be associated with compliance behaviors unless the client becomes anxious about the benefits of health care. Given and Given (1977) report that the perceived benefits of care was highly correlated with the compliance behaviors of eighty-eight hypertensive clients. Becker et al. (1977) suggest that the parent's faith in medical information and care is not significantly related to weight loss in obese adolescents. However, feelings of control over obesity and its consequences were significantly associated with weight loss during the first one half of therapy. Although three-fourths of the hypertensive subjects in a study by Johnson (1979) believed that decreased chances of stroke and heart attack were benefits of treatment, poor compliance was associated with their anxiety about

these potential complications.

<u>Perceptions of barriers</u> are the expressed beliefs and attitudes of the client concerning his/her ability to undertake aspects of the therapeutic regimen (Given and Given, 1979).

Reviews of the literature by Becker (1974), Sackett and Haynes (1976), Lostau (1979), and Haynes, Taylor, and Sackett (1979) cite several studies to suggest that monetary costs, the fear of pain or discomfort, and the need to adopt new patterns of behavior at work, within the family unit, and among social contacts, and the complexity of treatment regimens are associated with low levels of compliance.

Other barriers identified in research studies include anxiety about future disease complications, the requirement for lifelong treatment, and medication costs for hypertensives (Johnson, 1979). Inui et al. (1980) report that some combinations of drugs and certain drugs are perceived by hypertensives as more potent medications and may be associated with lower compliance rates.

Research by Becker et al. (1977) is suggestive that the provider's traditionally assumed conceptualizations of benefits and barriers to therapy may not be those client perceptions associated with favorable treatment or health outcomes. The client's perceptions of benefits and barriers may vary over time, with more general beliefs being initially predictive of compliance. Perceptions related to disease and therapy may be more predictive of long term compliance behaviors.

Given and Given (1982) question the testability and the client's understanding of the concepts in the health belief model as related to the health beliefs. The Givens suggest that benefits and barriers may not be two distinct concepts but rather represent together the client's

commitment to following aspects of the therapeutic regimen. Likewise, they suggest that perceived disease severity may represent motivation toward undertaking health behaviors intended to reduce the threat or severity of disease.

The methodologic difficulties of operationalizing and testing the belief concepts are further complicated by the fact that individuals may select health behaviors, not out of concern for health, but out of peer pressure or social desirability (Mikhail, 1979). Therefore, the gaps and inconsistencies in the health belief research literature must be weighed against these methodologic limitations.

In summary, the health belief model variables of susceptibility, severity, treatment benefits and barriers are associated with compliance to the therapeutic regimen accross varied health conditions and study samples.

#### Knowledge of Disease and the Therapeutic Regimen

Client knowledge of disease is defined as the factual information recalled and reported in response to questions concerning symptoms, etiology, course of illness, prognosis, possible complications or symptoms of disease, medications, diet, behavioral modifications, and prescribed follow-up visits (Given and Given, 1979).

The relationship of client knowledge on health perceptions, compliance behaviors, and health outcomes was thought to be ambiguous in earlier studies (Caldwell, 1970; Tagliacozzo and Ima, 1970; Finnerty, 1976; Sackett and Haynes, 1975; Daniels and Kochar, 1979; Webb, 1980; Tanner and Nourney, 1981).

More recently, research findings seem to be less ambiguous than reports from earlier studies. Glanz, Kirscht, and Rosenstock (1981)

explain that many prior studies omitted analyzing the mechanisms by which the educational interventions worked or failed to achieve the desired health outcomes. Intervening factors such as educational technique, the domain of the content, client--provider interaction, the client's subjective perceptions about the educational intervention, and the client's psychological state were omitted from analysis. The results of research representative of a mixture of educational strategies and a wide variety of dependent variables may not have been related to the experimental treatment.

Sackett and Haynes (1976), Schulman (1979), Bloom and Jordan (1979), and Feldman (1982) are but a few of the researchers who now conclude that increasing knowledge does not in itself result in more desirable compliance rates or in improvement in health outcomes. Furthermore, educational strategies may effect only one aspect on the treatment regimen while having no effect on other portions of therapy (Morisky, 1980; Glanz, Kirscht, and Rosenstock, 1981). For example: the differential results of four educational strategies for hypertensives is reported by Clanz et al., 1981. Printed materials increased knowledge about hypertension but had no effect on medication compliance. Telephone calls made by nurses to remind and reinforce clients about their medication regimen did increase medication compliance rates but had no effect on diet adherence. Clients who were taught to self-monitor their conditions achieved weight reduction but reported no improvement in medication or diet compliance. Social support strategies had a positive impace on medication compliance and weight control.

Bloom and Jordan (1979) conclude that educational strategies are

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most effective when tailored to clients according to their risk of complications, disease severity, and sociodemographic factors (age, race, and education). Morisky (1980) reports that a particular combination of educational strategies (e.g., small group instruction, family support, and exit interviews) may result in greater improvement in blood pressure control over any single or dual combination of these same strategies. Lane and Evans (1979), Tanner and Noury (1981), and Korhonen et al. (1983) purport that if the effects of educational progress are to promote long term disease control, permanent changes in client attitudes and motivation must be achieved in that educational intervention.

In summary, the relationship between knowledge and the client's health perceptions, reported compliance rates, and outcome health state seems to be dependent upon the specific instructional methodology implemented, the client's sociodemographic characteristics, and the client's clinical health state. The complexity of these factors make it impossible to draw conclusive relationships among these concepts. The client's knowledge of disease and the therapeutic regimen has been suggested to contribute less to adherence of the therapeutic regimen than do the health beliefs about the seriousness of disease and the benefits and barriers to following prescribed therapy (Sackett and Haynes, 1976; Langlie, 1977; Nelson, Statson, Neutra, and Solomon, 1980; and Given and Given, 1981).

#### Compliance

Stated compliance with the therapeutic regimen is defined as the extent to which the client states s/he is carrying out the therapeutic recommendations of health care providers concerning prescribed medications, diet, and behavior modification in exercise. There is not

agreement on the conceptual definition of compliance among investigators. Most researchers define compliance as the extent to which the client follows therapeutic recommendations (Becker et al., 1977; Hershey, Morton, Davis, and Reichgott, 1980; Inui et al., 1980; Seltzer, Ronceri, and Garfinkel, 1980; Tirrell and Hart, 1980; Wagner, Warner, and Slome, 1980; Dracup and Meleis, 1982; Feldman, 1982; and Morisky et al., 1982). These two definitions of compliance do not imply judgment or fault by either the client or the health care provider. Other researchers have defined compliance as: remaining under care and taking medications as prescribed (Scherwitz and Leventhal, 1978; Nelson et al., 1980; and Shulman et al., 1982) and cooperative performance (Andreoli, 1981). New dimensions of compliance have been added to the former definitions: blood pressure control (Haynes, Taylor, and Sackett, 1979), maintained or improved health status (Given and Given, 1982), and weight control (Report of the Working Group on Critical Patient Behaviors in the Dietary Management of High Blood Pressure, 1982).

One reason for the variation in conceptual definitions is the phenomenon of compliance use as an independent variable, a dependent variable, or as an intervening variable predictive of a health outcome. Researchers define compliance according to their own motives and area of content interest.

Blackwell (1975) and Feldman (1982) assert that compliance depends on a variety of factors that change over time. This is consistent with the McComb et al. (1980) report on the proposed critical client behaviors necessary for compliance in hypertensives. The McComb et al. article suggests that compliance begins with an initial decision to

comply which is made over and over again as the client readjusts his/her perceptions about the barriers and benefits of therapy. Compliance is both an intervening variable and a dynamic process.

Measures to determine the extent that client behavior coincides with the health care provider's recommendations also vary. Three methods have been used to measure compliance: (1) subjective measures based upon client interviews; (2) objective measures such as laboratory tests, pill counts, and pharmaceutical record audits; and (3) indirect measures as based upon the provider's judgment of the therapeutic effectiveness of the previously prescribed regimen (Gordis, 1976). Haynes et al. (1979) report that client interviews are a simple and useful approach in assessing compliance with antihypertensive therapy among newly diagnosed Canadian males. Although the Haynes et al. participants overestimated compliance by an average of seventeen percent, persons who admitted being noncompliant were found so. Objective measures were less accurate than interviewers in detecting compliance.

The potential for experimental bias is introduced in the process of measuring compliance. According to the Hawthorne Effect, the clients receive additional attention as a result of their participation in the study. This attention may alter a factor which is predictive of their compliance behavior. Webb (1980) suggests that an enhanced relationship with the subjects in her study may have been a factor in improved blood pressure control for both experimental and control subjects.

The need for coupling compliance to the achievement of treatment goals was first identified in the literature by Sackett (1979). The degree of compliance required for the achievement of the desired

treatment goal probably varies from one regimen to another. As Gordis (1979) points out, children taking as little as thirty percent of the prescribed prophylactic penicillin enjoy substantial protection from recurrence of rheumatic fever. The literature does not yet identify the minimal compliance levels necessary for the control of hypertension among various client categories.

A study by Tirrell and Hart (1980) can be used to summarize the relationship among health perceptions, knowledge, and compliance. These researchers suggest that knowledge of the exercise regimen and a decreased number of barriers to that regimen has the strongest relationship with compliance levels of post coronary bypass clients. The individual's perception of the efficacy of the exercise treatment was the factor with the next strongest relationship to compliance. Tirrell and Hart suggest that barriers to therapy be minimized by mutually establishing a clear individualized therapeutic plan. They also suggest that group teaching be used to clarify the treatment regimen and emphasize the benefits of treatment. The client's progress can be reinforced by assigning the client to keep weekly progress notes and by nurses making follow-up home visits. Supportive relationships with other clients and staff are encouraged to provide cues to encouraging compliance and enhancing positive self-perceptions.

A discussion of the third and final model used in the formulation of this study's conceptual framework follows.

## <u>Critical Patient Behaviors in High Blood Pressure Control as Proposed by</u> the National High Blood Pressure Education Program

The National High Blood Pressure Education Program (1973) has identified four basic steps to control hypertension: (1) detection.

(2) referral, (3) election of appropriate therapy and surveillance, and
(4) long term maintenance of therapy. The model of critical client behaviors in high blood pressure control is one method for facilitating
compliance with long term therapy.

The model of critical client behaviros proposes that when the client decides to implement the planned therapy, four critical health behaviors follow. First, the client makes the decision to control the blood pressure. This decision is influenced by perceptions about susceptibility to and seriousness of hypertension. Next, the client carries out the therapeutic regimen. An understanding of that regimen is necessary (knowledge, skills, and attitudes) before the client can fully implement the regimen. This second step also involves overcoming the barriers to action and readjusting his/her life style. Third, the client and nurse monitor progress toward the goal of blood pressure control. The client and nurse provider mutually identify the knowledge, attitudes, and skills that must be further developed to achieve a sense of mastery over the therapy and his/her life style. Lastly, the client must resolve those barriers which arise for situations of daily living which may block goal attainment. This fourth step may involve client initiated collaboration with the health care provider(s) to mutually overcome those barriers which the client cannot independently resolve.

As implied by these concepts, compliance is a continuous process of decision making. As problems are encountered throughout a lifetime, the client must again reaffirm his/her initial decision to control hypertension and take deliferate action to overcome numerous barriers. Although the group on high blood presure education has focused on

compliance with prescribed medications, I have altered the scope of their model to include the entire therapeutic regimen. The originators of the model of critical patient behaviors have not compared their framework with the health belief model. I believe that the selection of terms in the model on critical patient behaviors in high blood pressure control closely parallels the health belief model concepts so I am not violating their framework on critical patient behaviors by using terminology consistent with the health belief model.

A discussion on the relationship of this study's conceptual framework to nursing practice follows.

#### Relationship of the Conceptual Model to Nursing Practice

The conceptual model in Figure 2 has relevance for nursing practice and research. If we are to obtain the active participation of clients in their own care, we must better understand their motives and health beliefs (Mikhail, 1981).

In an initial assessment, the nurse can try to identify clients who are at risk for potential noncompliance. By evaluating the client according to the variables in this study's model, inappropriate health beliefs or misconceptions about health or the treatment regimen can be identified. The nurse is then free to select interventions that will modify the individual client's health beliefs, knowledge base, or environment.

The model suggests that compliance can be enhanced by increasing the client's perception of the efficacy of the therapeutic regimen and by identifying the benefits of taking certain actions. The nurse can also promote compliance by providing information regarding the benefits of taking certain actions. The nurse can also promote compliancy by providing information regarding the benefits of a variety of health options (Mikhail, 1981). However as Given (1977) and Webb (1980) suggest, it may be the quality of the interaction between the client and provider that actually enhances compliance to the regimen. In other words, specific nursing interventions to alter knowledge or the health beliefs may not be as effective in promoting compliance as the process of the interaction with the client. This conceptual framework is useful because it provides guidelines for the process and content of the client--provider interaction.

The ultimate goal of the conceptual framework is to select health behaviors that are most in keeping with the client's psychosocial and health care needs. By mutually planning the therapeutic regimen, the final plan should carry a high probability of success for the client.

According to Rosenstock and Kirscht (1974), Mikhail (1981), and Haynes et al., (1982) the health belief model is only partially developed. Further research is needed to increase the model's contribution to understanding compliance behaviors. The relationships between the variables and health outcomes is incomplete, especially among the health beliefs. Moreover, additional variables may belong in the model. Mikhail (1981) suggests that psychological stress, coping styles, and locus of control be studied in relation to the model. Given (1977) notes that perceptions of health state, as measured by sociodemographic factors and psychological stress, is a predictor of compliance not included in the present model.

The health belief model has stimulated many questions about the interrelationships of the variables it contains, their presence in

different client populations, and changes in beliefs over time. It serves as a model that may be able to unify previously unrelated concepts.

In summary, King's theory for nursing provides the concepts of communication and decision-making, skills necessary for the client and provider to possess if they are to achieve client-centered goals. The processes of communication and decision-making are not included in the present health belief model. King (1981) also reinforces the complexity of the social systems within which dynamic man reacts. The health belief model has particular relevance for nursing practice and research because it incorporates the psychosocial aspects of the client with predictable health behaviors. It is imperative that nursing science contribute to the future development of the health belief model to ensure its applicability to nursing clientele. The National High Blood Pressure Education Program's critical patient behaviors are included to clarify the process of compliance and to operationalize the health belief model

#### Summary

This study's conceptual framework and model are based upon three published works: King's theory (1981) for nursing, the health belief model (1974), and the critical patient behaviors in high blood pressure control (1973). King's theory for nursing provides the framework into which the health belief model and critical client behaviors to control hypertension can be placed (See Figure 2). King's model also outlines the interaction process whereby the client and nurse mutually establish a therapeutic regimen, evaluate progress, and make the necessary changes to ensure goal attainment and improved health status. The health

belief model concepts are useful in establishing the content areas for interaction with the client and for planning a therapeutic regimen that is consistent with the psychosocial beliefs of the client. The critical patient behaviors in high blood pressure control is one method for operationalizing compliance as a dynamic process and intervening variable predictive of blood pressure control. A review of the litareture is presented in Chapter III for the purpose of linking this study with the work and ideas of others concerned with high blood pressure control.

#### CHAPTER III

### REVIEW OF LITERATURE

The major focus of the literature review is on those research studies which contain descriptive characteristics of study samples (sociodemographic characteristics and duration of disease) and/or an independent variable(s) (health perceptions/beliefs/commitments, knowledge of disease and the therapeutic regimen, and compliance with the therapeutic regimen) as probable differentiating characteristics for hypertensives making the most and least progress toward blood pressure control.

The literature related to the dependent variable, progress toward blood pressure control, will be presented initially and followed by studies about the descriptive and independent variables.

## Dependent Variable Blood Pressure Control

The dependent variable -- progress toward blood pressure control -was selected as the criterion for identifying these clients who are likely to achieve progress toward diastolic blood pressure control as well as to identify those clients at risk for unacceptable health outcomes. Until recently, little recognition has been given to persons with high blood pressure who failed to respond to and remain in treatment. Formerly, the issue of compliance with the therapeutic regimen has received a major emphasis in the research literature from 1971 to 1980 when the percentage of individuals with adequately controlled blood

pressures doubled from sixteen percent in 1971-1972 to thirty-four percent in 1979-1980 (National High Blood Pressure Education Program, 1984). Although considerable progress has been made in high blood pressure control over the past decade, much work remains to be done to maintain these favorable trends in the control of hypertension. Specifically, the subgroups of hypertensives who have failed to achieve high blood pressure control must be identified and offered effective clinical intervention programs.

One goal of nursing research is to assure quality of care to our clientele. Studying outcome measures of improved client health is one such approach to enhancing the quality of nursing care. Progress toward blood pressure control was selected as one quality of care measure because blood pressure control is an important factor in the control of cardiovascular diseases.

According to the general cardiovascular risk profile generated in the Framingham Study, the single most useful factor for detecting clients at high risk of cardiovascular disease is the blood pressure, although it is not equally important for all types of cardiovascular diseases. Risk of cardiovascular morbidity and mortality is reported to be proportional to the level of the systolic and/or diastolic blood pressure elevation, indicating that there is no critical blood pressure value to indicate where normal and abnormal risk begins. Kannel et al. (1976) conclude that a steady increment of risk exists with increasing systolic and diastolic blood pressure. The <u>1980 Report of the Joint</u> <u>National Committee on Detection, Evaluation, and Treatment of High</u> <u>Blood Pressure</u> states that " ... long term reduction of blood pressure decreases overall mortality at all levels of hypertension" (p. 9).

The aim of hypertensive treatment is usually accepted as a reduction of the blood pressure to as near normal as possible (Johnston et al., 1980). However, incomplete control of blood pressure has been shown to reduce the incidence of vascular complications (Taguchi and Fries, 1974). It has been suggested that the lowering of the blood pressure to "normal levels" may not confer any additional advantage over the partial reduction of an elevated blood pressure (Inglefinger and Goldman, 1977).

The word progress is defined as a variable to indicate improvement or movement toward a higher state of health. Progress in lowering blood pressure levels has been chosen for the criteria in defining this study sample because the literature over the past fifteen years indicates that the amount of decrease in the risk of cardiovascular diseases (Veterans Administration Cooperative Study Group, 1967, 1970, 1972; Kannel et al., 1970; Kannel et al., 1972; Taguchi and Fries, 1974; Kannel, 1976; Krishan, 1979; Kuchel, Mahon, McKenzie, and Rocella, 1983). For example: recent data from the National High Blood Pressure Education Program reports that blood pressure control is considered to be a major contributor to the twenty-seven percent decline in deaths from coronary heart disease and a forty-two percent decline in stroke mortality in the period from 1972 to 1982 (Rocella, 1983). One additional report, the five year mortality rates published by the Indiana State Board of Health (1973-1979), purports a direct relationship between higher cardiovascular mortality rates and diastolic blood pressure elevations (Daughtery, 1981).

The criterion recommended by the World Health Organization as indicative of hypertension is a diastolic blood pressure of at least 95 mm Hg. Since the aim of antihypertensive therapy, as recommended by the National High Blood Pressure Program in 1973, is to achieve and maintain an average diastolic blood pressure of less than 90 mm Hg., blood pressure control is defined in this study as a diastolic blood pressure equal to or less than 90 mm Hg. One other research team defined blood pressure control in this same manner, Nelson et al. (1978).

The published research studies on blood pressure control have not consistently employed any one definition of diastolic blood pressure control. For example: Fletcher, Deliakis, Schock, and Shapiro (1979) defined a "well controlled blood pressure" as a diastolic measurement of less than 75 mm Hg. while an uncontrolled blood pressure was defined as equal to or greater than 95 mm Hg. Dove and Schneider (1982) defined controlled diastolic blood pressure as a final diastolic blood pressure of less than 95 mm Hg. or a final diastolic blood pressure of greater than or equal to 90 mm Hg., given at least a 10 mm Hg. drop in the diastolic blood pressure was achieved in the latter case. Pierce et al. (1984) defined controlled diastolic blood pressure as less than 95 mm Hg. Hershey, Morton, Davis, and Reichgott (1980) defined blood pressure control according to chronological age with a controlled diastolic pressure of less than or equal to 90 mm Hg. for ages twenty to thirty-nine, equal to or less than 95 mm Hg. for ages forty to fifty-nine, and equal to or less than 100 mm Hg. for ages sixty years and older. Caldwell, Cobb, Dowling, and de Jongh (1970) and DeVon and Powers (1984) based controlled blood pressure on the clinical judgment of physicians and not on investigative criteria.

One limitation of this literature review is the paucity of published research using blood pressure as an independent or dependent variable. Eighteen studies have been retrieved and reviewed which contain blood pressure or blood pressure control as a study variable: Boyer and Kasch (1970); Syme et al. (1974); Morgan et al. (1978); Stamler et al. (1978); Fletcher, Deliakis, Schoch, and Shapiro (1979); Tanner and Noury (1981); Wagner, Truesdale, and Warner (1981); Brown, Brown, and Stephens (1982); MacGregor (1982); Powers and Wooldridge (1982); Freeman et al. (1982); Buck and Donner (1984); DeVon and Powers (1984); and Pierce et al. (1984).

The relationships between the variables contained in this study and blood pressure parameters has not been consistently studied and/or reported in the published research literature. Therefore, a valid, precise, and comprehensive statement of predictive characteristics for those clients most and least likely to achieve blood pressure control cannot be drawn from the available research literature. Rather, a generalized description of the relationships between this study's variables and blood pressure control will be inferred from the limited body of blood pressure control research.

# <u>Descriptive</u> Findings <u>about</u> <u>Previous</u> <u>Study</u> <u>Samples</u> <u>Sociodemographic</u> <u>Characteristics</u>

Pertinent research on the genetic influences of blood pressure (age, sex, and race) are presented first and followed by findings about environmental influences of family income, education, and occupation.

Age

Age is reportedly associated with blood pressure control among

treated hypertensives, with the older aged hypertensives being more likely to have a controlled blood pressure in four separate studies (Fletcher, Deliakis, Schock, and Shapiro, 1979; Stamler et al., 1980; Wagner, Truesdale, and Warner, 1981; Freeman et al., 1983).

Fletcher, Deliakis, Schock, and Shapiro (1979) report that older age  $(\bar{\mathbf{x}} = 68 \text{ years})$  is significantly associated  $(p \leq .05)$  with a well controlled diastolic blood pressure (< 75 mm Hg.) among thirty predominantly elderly, female, Canadian hypertensives. A mean age of fifty-sex years was significantly  $(p \leq .05)$  associated with an uncontrolled blood pressure for a subgroup (n = 19) of the study's participants (N = 123). Fletcher et al. did not control for the quality of medical care received by these hypertensives which may have impacted treatment outcomes.

Stamler et al. (1980) report that obese Chicago males (N = 115) of mean age fifty to sixty years with mild hypertension (diastolic blood pressure < 110 mm Hg.) achieved and sustained blood pressure normalization (diastolic blood pressure < 90 mm Hg.) over a ten year period given improvements in diet and exercise habits.

Wagner, Truesdale, and Warner (1981) report on a rural sample (N = 385) of biracial North Carolina hypertensives surveyed in 1976. Diastolic blood pressure elevations in younger men (18 to 39 years old) were reported to be the most difficult pressures to control since less than fifty percent of these younger men had diastolic blood pressures less than 90 mm Hg. on two occasions. Among treated hypertensive males, diastolic blood pressure control (diastolic blood pressure - 90 mm Hg.) was significantly (p < .01) more frequent over the age of sixty years.

Freeman et al. (1983) report that the likelihood of effective hypertensive treatment increases with increasing age (50 years and over)

for both sexes among Connecticut adults (N = 4,582) in 1978-1979.

Three published studies contain findings contrary to the reported associations between older age (50 years and over) and blood pressure control: Dove and Schneider (1980); Buck and Donner (1984); and DeVon and Powers (1984). Dove and Schneider (1980) report that age is not associated with diastolic blood pressure control (< 95 mm Hg.) among predominantly caucasian, West Haven veterans, and hypertensives (N = 352). Buck and Donner (1984) report that age is not a confounding factor in the loss of blood pressure control (< 90 mm Hg.) among treated, Canadian, hypertensives (N = 235).

Age was not significantly associated with blood pressure control in a study by DeVon and Powers (1984) of caucasian, upper class, suburban, Illinois residents (N = 30), with a mean age of fifty-five years. Blood pressure control was defined by physician judgment.

In summary, four of seven studies (Fletcher, Deliakis, Schock, and Shapiro, 1979; Norbrega, Morrow, Smoldt, and Offord, 1977; Stamler et al., 1980; Wagner, Truesdale, and Warner, 1981; Freeman et al., 1983) report an association between age and blood pressure control among treated hypertensives. Older aged hypertensives, from ages fifty to sixty-eight, are reported to be more likely to have a controlled blood pressure than younger hypertensives in the four cited studies. The three remaining studies (Dove and Schneider, 1980; Buck and Conner, 1984; DeVon and Powers, 1984) on subjects from the middle and upper classes do not support the association between older age (50 years and over) and blood pressure control. This discrepancy in the relationship between age and blood pressure control leads to the question of a possible interaction between age, socioeconomic status, and blood

pressure control. It is of interest to note that those studies reporting no relationship between age and blood pressure control were on more homogeneous samples than the Stamler et al. (1980) and Freeman et al. (1983) study populations.

The relationship between age and blood pressure control is not reported in these studies: Boyer and Kasch (1970); Syme et al. (1974); Morgan et al. (1978); Webb (1980); Tanner and Noury (1981); Brown, Brown, and Stephens (1982); MacGregor et al. (1982); Powers and Wooldridge (1982); and Pierce et al. (1984). No significant interaction between the duration of hypertension and age is reported in three separate studies: Fletcher, Deliakis, Schoch, and Shapiro (1979); Powers and Wooldridge (1982); and DeVon and Powers (1984). A review of the literature which contains information on the relationship between sex and blood pressure control follows.

## Sex

Two reports from the Hypertension Detection and Follow-Up Program Cooperative Study Group apparently conclude that females in the general population had better blood pressure control than males (Schulman, 1982; Rocella, 1983) during the 1976-1980 National Health and Nutrition Examination Survey as based on a nationwide probability sample (N = 7,710) of adults aged eighteen to seventy-nine years. Four studies (Wagner, Truesdale, and Warner, 1981; Brown, Brown, and Stephens, 1982; Freeman et al., 1983; DeVon and Powers, 1984) report that female hypertensives are more likely than male hypertensives to have a controlled diastolic blood pressure (< 90 mm Hg.).

Wagner, Truesdale, and Warner (1981) report that women receiving hypertensive treatment were significantly (p < .005) more likely to

have a controlled diastolic blood pressure (< 90 mm Hg.) than men among biracial, rural, North Carolina, hypertensives, currently under treatment (N = 385). In addition, younger men (18 to 39 years) of both caucasian and black races were reported to be the group of hypertensives with the most difficult to control diastolic blood pressures. Less than one-half of these younger aged men had diastolic blood pressures less than 90 mm Hg.

Brown, Brown, and Stephens (1982) report that female gender is significantly correlated with systolic elevations (r = .003) and with diastolic elevations (r = .032) among poor black Harlem residents (N = 107) in substandard housing, with high infant and adult mortality rates, and with limited access to health care. This study population contained both diagnosed hypertensives, persons unaware of their blood pressure elevations, and normotensives. Therefore, the findings in this study must be reviewed with some caution since the data is not reflective of a hypertensive population.

The prevalence distribution of hypertension among Connecticut adults (N = 4,582) in 1978-1979 indicates that males over age fifty were less likely than females to have a controlled blood pressure (Freeman et al., 1983). DeVon and Powers (1984) report that females comprised sixty-seven percent of the controlled (based on physician judgment) hypertensives (n = 15) and fifty-four percent of the uncontrolled (n = 15) hypertensives from a caucasian middle to upper class Chicago suburb with an average age of fifty-five years.

Two studies, by Fletcher, Deliakis, Schoch, and Shapiro (1979) and Buck and Donner (1984) contain reports that sex does not distinguish between study subjects with controlled and uncontrolled diastolic

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blood pressures.

Fletcher, Deliakis, Schoch, and Shapiro (1979) report that sex does not distinguish between well controlled (< 75 mm Hg.) and uncontrolled ( $\geq$  90 mm Hg.) diastolic blood pressures among ambulatory, polyclinic, hypertensives (N = 123) in Montreal. These subjects were predominantly elderly, females, with a disease duration of over one year.

Buck and Donner (1984) studied the effects of life events on blood pressure control among treated and initially controlled hypertensives (N = 235) over eight months. At the end of the study period, seventeen percent (n = 41) of the subjects had uncontrolled diastolic blood pressures (90 mm Hg.). Possible confounding factors of sex, age, education, smoking, and social support were not significantly associated with the loss of diastolic blood pressure control. However, never married subjects had a greater likelihood of the loss of blood pressure control.

A portion of the more recent data from the behavioral risk prevalence survey (Center for Disease Control, 1983) for eight states and the District of Columbia reveals an almost similar prevalence rate of uncontrolled hypertension for males ( $\bar{x}$  4.78 per 1,000 population) and women ( $\bar{x}$  4.65 per 1,000 population).

Selected examples of the literature on medical care utilization and compliance was reviewed to identify some possible confounding factors which may, at least partially, account for the variations in blood pressure control among male and female hypertensives. A brief discussion of the medical care utilization studies follows.

Females reportedly have higher clinic attendance rates than males in the general population (N = 7,710) (Shulman et al., 1982).

Apostolides et al. (1978) purport that women ages thirty to thirty-nine have the highest blood pressure screening participation rates of any age and sex subgroup (N = 5,314) among hypertensives ages thirty to sixty-nine in the first year after diagnosis. Readiness to begin hypertensive treatment by females has been suggested by Nelson et al. (1980) to be one of three variables predictive ( $p \leq .01$ ) of medication compliance.

Hypertensive males under age fifty reportedly use medical care services less than other age and sex categories (Wagner, Warner, and Slome, 1980). One additional study by Apostolides et al. (1978) reports that males ages thirty to thirty-nine have the lowest participation rates in blood pressure screening among southern hypertensives (N = 2,939). In addition to lower health care utilization rates, hypertensive males are purportedly more likely to be noncompliant with treatment. In a study (N = 5,314) by Nelson et al. (1980) of urban Massachusetts hypertensives (N = 142) receiving clinic care, seventy percent of the males (n = 44) were noncompliant with daily medication taking regimens as compared to fifty-five percent of the females (n = 98)(p < .02).

In summary, four of six studies (Wagner, Truesdale, and Warner, 1981; Brown, Brown, and Stephens, 1982; Freeman et al., 1983; DeVon and Powers, 1984) purport that female hypertensives are more likely than men to have controlled diastolic blood pressures. The relationship between sex and blood pressure control would seem to be confounded by a variety of factors, some of which may include: age, marital status, medical care utilization behaviors, readiness to begin hypertensive treatment, and medication compliance.

The relationship between sex and blood pressure control is not reported in these studies: Boyer and Kasch (1970); Syme et al. (1974); Morgan et al. (1978); Stamler et al. (1978); Fletcher, Deliakis, Schoch, and Shapiro (1979); Dove and Schneider (1980); Stamler et al., (1980); Webb (1980); Tanner and Noury (1981); MacGregor (1982); Powers and Wooldridge (1982); and Pierce et al. (1984). A review of the literature which contains information on the relationship between race and blood pressure control follows.

## Race

The review of literature containing information about the relationship between race and blood pressure control is limited to contrasting the research findings on Blacks and Caucasians since data is not readily available on other races. Three published reports (Fletcher, Deliakis, Schoch, and Shapiro, 1979; Dove and Schneider, 1980; Wagner, Truesdale, and Warner, 1981) contain data which is suggestive that race is not associated with diastolic blood pressure control.

Fletcher, Deliakis, Schoch, and Shapiro (1979) report that race is not associated with a "well controlled" diastolic blood pressure (< 75 mm Hg.) among hypertensive medical clinic cleints (N = 123) in Canada. The racial breakdown of the study sample is not given in the published report.

Dove and Schneider (1980) report that race is not associated with diastolic blood pressure control (< 95 mm Hg.) among predominantly caucasian, hypertensive, West Haven veterans (N = 352). Wagner, Truesdale, and Warner (1981) also report that no important racial differences in blood pressure control existed among currently treated.

biracial, rural, North Carolina, hypertensives (N = 385). The racial composition of the study sample is not given in the published report.

One additional study by MacGregor et al. (1982) contains data on the relationship between race and the reduction in mean systolic and diastolic blood pressures during moderate sodium restriction (60 to 80 mmol/day) among mild to moderate hypertensives (N = 19) not currently receiving pharmacologic treatment. No significant differences in blood pressure reductions were reported between black (n = 7) and caucasian (n = 12) subjects at four weeks into the double-blind randomised cross-over trial of sodium restriction.

It is interesting to note that the issue of racial versus environmental influence on blood pressure was studied by Syme et al. (1974) among Kaiser-Permanente Health Plan enrollees (N = 22,078) in 1968-1969. Syme et al. report that a substantial difference in the prevalence of hypertension exists among social class groups. Persons, both Blacks and Caucasians, in the lower social class had the highest blood pressure elevations. However, Blacks had higher blood pressures than Caucasians overall.

In summary, no published report was retrieved which reported a relationship between race and blood pressure control. Three studies (Fletcher, Deliakis, Schoch, and Shapiro, 1979; Dove and Schneider, 1980; Wagner, Truesdale, and Warner, 1981) contain reports that race is not associated with blood pressure control, particularly among caucasian hypertensives. The exact racial composition of the Fletcher, Deliakis, Schoch, and Shapiro (1979) and Warner, Truesdale, and Warner (1981) study samples is not reported.

The relationship between race and blood pressure control is not

reported in these studies: Boyer and Kasch (1970); Morgan et al. (1978); Stamler et al. (1978); Tanner and Noury (1981); Brown, Brown, and Stephens (1982); MacGregor et al. (1982); Powers and Wooldridge (1982); van Reek et al. (1982); Freeman et al. (1983); Buck and Donner (1984); DeVon and Powers (1984); and Pierce et al. (1984). A review of the literature which contains information on the relationship between total family income and blood pressure control follows.

#### Family Income

Family income and education were first hypothesized to be the most probable determinants of clinic attendance in a study by Caldwell et al. (1970) on a sample of Detroit hypertensives (N = 76). Caldwell et al. reported that of those hypertensives who dropped out of therapy (n = 42), sixty-nine percent had annual incomes of less than \$6,000 while only forty-six percent of those who ramained under treatment for five years or longer (n = 24) had incomes of less than \$6,000 (p<.01). No additional studies were retrieved in this portion of the literature review which addressed the relationship of family income and blood pressure control from the 1970 through 1984 literature.

One study by Johnston et al. (1984) reports on the cost-effectiveness of hypertensive treatment, using income as the dependent variable. Johnston et al. (1984) report that hypertensive Canadian steelworkers (N = 230) earned an average of \$1093 less annually than a matched sample of normotensive employees, five years after initial screening for hypertension. Two control variables, compliance with hypertensive treatment and awareness of blood pressure elevation at the screening were not not related to the adverse effect of hypertension on income.

It is of interest to note that the focus of the research literature, especially concerning the demographic factors of income and education, has not been consistent with the theoretical emphasis placed on these two demographic factors. In an attempt by Cummings, Becker, and Maile (1980) to consolidate ninety-nine theoretical concepts from fourteen different conceptual models concerning health behaviors, demographics was one of six overall conceptual categories thought to be related to client health behaviors. Income and education were identified by the panel of theorists as the demographic variables of primary interest for future research.

In summary, no study could be retrieved which focused on the relationship between total family income and blood pressure control. One study (Caldwell et al., 1980) contains data which suggests that a family income of less than \$6,000 annually is significantly associated with dropping out of hypertensive therapy. The lack of empirical data on family income and blood pressure control leads to the conclusion that further investigation is warranted.

The relationship between total family income and blood pressure control is not reported in these studies: Boyer and Kasch (1970); Syme et al. (1974); Morgan et al. (1978); Stamler et al. (1978); Fletcher, Deliakis, Schoch, and Shapiro (1979); Dove and Schneider (1980); Stamler et al. (1980); Webb (1980); Tanner and Noury (1981); Wagner, Truesdale, and Warner (1981); Brown, Brown, and Stephens (1982); MacGregor et al. (1982); Powers and Wooldridge (1982); Freeman et al. (1983); Buck and Donner (1984); DeVon and Powers (1984); and Pierce et al. (1984). A review of the literature which contains information on the relationship between education and blood pressure control

follows.

### Education

The highest level of attained education is inversely associated with blood pressure control in one study by Jenkins, Somerwell, and Homes (1983) on normotensive subjects. Jenkins, Somerwell, and Homes (1983) report that higher systolic and diastolic blood pressures were significantly associated (r = -.191 and -.194 respectively) with lower educational levels among normotensive employed males (N = 172) studied over the course of eight to fourteen annual physical examinations. However, the blood pressure elevations for subjects with "lower educational levels" were only present during the first four annual examinations. The definition of "lower educational level" is not clear in the published study.

One additional study by Hershey, Morton, Davis, and Reichgott (1980) implies that high school completion is associated with always taking medication, which in turn is associated with blood pressure control. Hershey, Morton, Davis, and Reichgott (1980) report on hypertensives (N = 132) attending weekly health education sessions at a Pennsylvania hospital who are predominantly black, middle aged, and with one-half of the sample reporting incomes of less than \$5,000 annually. Of those subjects who completed high school (n = 90), fifty-two percent report always taking prescribed medication. Of those subjects who did not complete high school (n = 41), forty-one percent report always taking medication. Of those subjects who report always taking medication. If there a controlled blood pressure appropriate for their chronological age. This study does not empirically test the direct relationship

between educational attainment and blood pressure control.

Two studies (Buck and Donner, 1984; and DeVon and Powers, 1984) contain evidence contrary to the inverse relationship between educational achievement and blood pressure control. Buck and Donner (1984), in a multivariate analysis of life events affecting blood pressure control among hypertensives (N = 235), report that neither education beyond high school nor high school or lesser education is significantly associated with the loss of blood pressure control experienced by forty-one subjects.

DeVon and Powers (1984) report that education is not significantly associated with controlled (n = 15) and uncontrolled (n = 15) blood pressures among caucasian, middle to upper class, Chicago hypertensives. Blood pressure control was defined by the clinical judgment of a physician, and not by objective criteria. The average years of schooling was greater for the controlled group (14 years) than for the uncontrolled group (12.8 years). Both groups were well educated, particularly the controlled group with forty-seven percent possessing a bachelor's degree or higher. Twenty percent of the uncontrolled subjects listed a bachelor's degree or higher as their highest educational achievement.

In summary, one of three studies (Jenkins, Somerwell, and Homes, 1983) contains evidence to suggest that higher systolic and diastolic blood pressures are significantly associated among normotensive, employed, males, who possess an unspecified "lesser educational" achievement. Two studies (Buck and Donner, 1984; DeVon and Powers, 1984) contain data to suggest that education is not significantly associated with blood pressure control. The DeVon and Powers (1984) findings do show nonsignificant trends for an association between education beyond

high school and blood pressure control.

The relationship between education and blood pressure control is not reported in these studies: Boyer and Kasch (1970); Syme et al. (1974); Morgan et al. (1978); Stamler et al. (1978); Fletcher, Deliakis, Schoch, and Shapiro (1979); Dove and Schneider (1980); Stamler et al. (1980); Webb (1980); Tanner and Noury (1981); Wagner, Truesdale, and Warner (1981); Brown, Brown, and Stephens (1982); MacGregor et al. (1982); Powers and Wooldridge (1982); Freeman et al. (1983); and Pierce et al. (1984). A review of the literature which contains information on the relationship between occupation and blood pressure control follows.

#### Occupation

One study by DeVon and Powers (1984) was retrieved which reviewed the relationship between occupation and blood pressure control. DeVon and Powers (1984) report that no significant association was found between occupation and blood pressure control, as defined by physician judgment. The study population was comprised of middle to upper class, suburban, Chicago, hypertensives (N = 30). Seventy-three percent of the subjects with a controlled blood pressure (n = 15) were skilled or professional workers while sixty-seven percent of the uncontrolled subjects (n = 15) were skilled or professional workers. Twenty percent of the subjects with a controlled blood pressure were unskilled while thirteen percent of the uncontrolled subjects were unskilled.

In summary, there is a lack of empirical evidence concerning the relationship between occupation and blood pressure control. One study by DeVon and Powers (1984) contains data which is suggestive that no
significant relationship between occupation and blood pressure control exists among middle to upper class subjects.

The relationship between occupation and blood pressure control is not reported in these studies: Boyer and Kasch (1970); Syme et al. (1974); Morgan et al. (1978); Stamler et al. (1978); Fletcher, Deliakis, Schoch, and Shapiro (1979); Dove and Schneider (1980); Stamler et al. (1980); Webb (1980); Tanner and Noury (1981); Wagner, Truesdale, and Warner (1981); Brown, Brown, and Stephens (1982); MacGregor et al. (1982); Powers and Wooldridge (1982); Freeman et al. (1983); Buck and Donner (1984); and Pierce et al. (1984). A review of the literature containing information on the relationship between the duration of hypertension and blood pressure control follows.

To better understand the relationship of disease severity upon the study findings, the concept of disease duration was included in this study as a descriptive variable. The following discussion clarifies the relationship between disease severity and druation of disease.

Goroll, May, and Mulley (1981) report that the longer the duration of hypertension, especially when the diagnosed onset of disease occurs in the younger age groups, the greater the likelihood of nonfatal hypertensive events and cardiovascular-related death. This association is based on the findings of the Veterans Administration Cooperative Study Group in 1970 and 1972. It can be inferred that the longer the known duration of diagnosed hypertension, the longer the natural course of the disease and the more probable it is that a more severe hypertensive disease state will eventually exist.

Norbrega, Morrow, Smoldt, and Offord (1977) report that the duration of hypertension is not predictive of diastolic blood pressure control among treated hypertensive clients (N = 130), two-thirds of whom had mild diastolic blood pressure elevations, with a disease duration of five to nine years. Norbrega, Morrow, Smoldt, and Offord performed a quality of care assessment in hypertension. No provider processes of care were significantly related to the blood pressure outcome among participants in this study sample.

Dove and Schneider (1980) report that the duration of hypertension is not significantly associated with overall blood pressure control (- 95 mm Hg. or 2 90 mm Hg. with a 2 10 mm Hg. drop) among West Haven veterans (N = 352) with an average age of fifty-four years. A subgroup of these subjects (n = 338) achieved a reduction (average decline of 16.7 mm Hg.) in the diastolic blood pressure after one year of antihypertensive therapy. A description of the duration of disease is not reported for this sample. In addition, the subgroup of fourteen subjects for whom an increase in the diastolic blood pressure was noted, was not analyzed for variations in sociodemographic characteristics according to the exact duration(s) of disease.

DeVon and Powers (1984) report that a nonsignificant trend for **controlled** hypertensives (n = 15) to have a slightly shorter duration (9.32 years; difference = 2.38 years) of hypertension than uncontrolled **hypertensives** (11.7 years) among Caucasian, middle to upper income, **suburban**, hypertensives of an average age of fifty-five years. It is **interesting** to note that study subjects in the uncontrolled group (n = 15) **did** experience less psychosocial adjustment to illness, which in turn was significantly correlated with less self-reported medication taking.

According to the conceptual framework in Chapter II, the duration of hypertension is representative of the illness experience, which in turn effects the health perceptions, knowledge of disease and the therapeutic regimen, and compliance behaviors. The rationale for including the duration of hypertension in this study was to place the study findings within the context of the illness experience.

One study (Hershey, Morton, Davis, and Reichgott, 1980) contains information which suggests that a significant association between the duration of hypertension and blood pressure control exists. Hershey, Morton, Davis, and Reichgott (1980) report that a short duration (less than 5 years) of antihypertensive treatment was significantly (p - .05) related to medication compliance (self-reported medication taking of "always") which in turn was significantly (p < .02) related to **blood** pressure control (diastolic blood pressure appropriate for age). Two other variables contributed independently to medication compliance: control over health matters and perceived barriers to medication taking. The study sample (N = 132) consisted of predominantly female, Blacks, of an average age of fifty-two years, and with one half of the total sample reporting a family income of less than \$5,000 in 1977. Of the subjects (n = 65) reporting a long duration of antihypertensive treatment (≥ 5 years), forty percent reported "always" taking medication(s). Of those subjects (n = 64) reporting a short duration of treatment of less than five years, fifty-six percent reported "always" taking medication(s).

Three studies authored by Norbrega, Morrow, Smoldt, and Offord, 1977: Dove and Schneider, 1980; and DeVon and Powers, 1984

contain data which suggests that the duration of disease is not related to blood pressure control among subjects with an average disease duration ranging from five to eleven years, and who do not represent lower income levels. The relationship of duration of disease to blood pressure control is not clear from these studies.

The relationship between the duration of hypertension and blood pressure control is not reported in these studies: Boyer and Kasch (1970); Syme et al. (1974); Morgan et al. (1978); Stamler et al. (1978); Fletcher, Deliakis, Schoch, and Shapiro (1979); Stamler et al. (1980); Webb (1980); Tanner and Noury (1981); Wagner, Truesdale, and Warner (1981); Brown, Brown, and Stephens (1982); MacGregor (1982); Powers and Wooldridge (1982); Freeman et al. (1982); Buck and Donner (1984); and Pierce et al. (1984).

A discussion of the relationship between the sociodemographic characteristics, the duration of hypertension, and blood pressure control has been presented and is followed by a discussion of this study's independent variables (health perceptions, knowledge of disease and the therapeutic regimen, and self-reported compliance).

### Health Perceptions

Previous research has concentrated on the relationship between the health beliefs and compliance behaviors. A paucity of information exists concerning the association between the health perceptions of hypertensives and their clinical outcome of blood pressure control.

For the purpose of this study, health perceptions are defined as the client's expressed benefits and attitudes about the severity of disease, the benefits of treatment and continuing care, and the barriers to carrying out the prescribed plan of care. The perceptions of disease susceptibility and severity provide energy for the client to take health actions. The perceived benefits and the perceived barriers to health care provide the direction that the client's behavior will take. The word "commitment" is used to represent the combined concepts of benefits and barriers to the treatment regimen. The following literature review contains information concerning the perceived seriousness of disease and the perceived benefits and barriers to following a therapeutic regimen.

## Number and Severity of Hypertensive Symptoms

The research literature contains data which is suggestive that a curvilinear relationship exists between the perceived seriousness of the severity of disease and compliance with a variety of therapeutic regimens. That same body of literature does not specifically address the association between the actual number of and severity of hypertensive symptoms and blood pressure control. This section of the literature review will focus on hypertensives' perceived symptomatologyk only one approach to operationalizing the perceived seriousness and severity of disease.

van Reek et al. (1982) report a nonsignificant relationship between the level of diastolic blood pressure and the total number of subjective complaints in a matched sample (N = 157) of hypertensive and normotensive males aged twenty-one to sixty-five years old in Heer, Netherlands. van Reek et al. report that males with a diastolic blood pressure of 81 to 90 mm Hg. reported the lowest mean total of complaints as compared to two or three additional complaints by males with diastolic blood pressures below and above this range. A

nonsignificant trend emerged of increasing subjective complaints with increasing diastolic blood pressure levels of at least 90 mm Hg. These researchers recommend that further research be undertaken to study the relationship between the total number of reported symptoms and diastolic blood pressure levels.

The traditional label of asymptomatic hypertension, as applied by Kaplan (1978) and others is refuted by van Reek et al. (1982). van Reek et al. suggest that the hypertensives awareness of the diagnosis itself might be associated with an increase in subjective complaints.

One limitation in operationalizing the perceived seriousness and severity of disease as the number and severity of symptoms may be a differentiation in symptom reporting according to gender. Verbrugge (1980) analyzed the data collected on persons (N = 46,868) in fourteen communities during the National Ambulatory Medical Care Survey to determine if sexual differences may account for various presenting complaints. Verbrugge reports that men and women to do differ significantly in symptom perception, interpretation, and description. Men are purported to be more unaware of health problems in general, may delay in seeking care for perceived symptoms, and may be reticent to dusclose some symptoms to physicians. Women are reported to have a broader interpretation of discomforts as signs of illness whereas men report feeling uncomfortable rather than ill. Women tend to present with a greater variety and more general symptoms such as fatigue, pain, or general malaise. Verbrugge interprets these gender related differences in symptomatology as three psycho-social feature of symptom perception and interpretation: views of illness, ignorance, and

symptom denial.

In summary, the relationship between the actual number of hypertensive symptoms and the perceived severity of those symptoms and blood pressure control remains to be experimentally validated. The published literature does not address the relationship between the perceived severity of hypertensive symptoms and blood pressure control. A discussion of the literature which contains information on the benefits and barriers to the medication regimen and blood pressure control follows.

## Benefits and Barriers (Commitment) to Medication Regimen

The hypertensive's health perceptions concerning the medication regimen have more commonly been studied in relation to compliance with the medication regimen. However, two studies address the relationship between the health perceptions and blood pressure control: Johnson (1979) and Schulman (1979).

Johnson (1979) reports on the health beliefs of hypertensives (N = 43) in the University of Colorado's Family Practice Residency Program. Johnson reports that the necessity of taking medication daily and the cost of medications were the most bothersome barriers to the treatment regimen (medication alone and medication and diet regimens in 37% of cases). It is interesting to note that virtually all the study subjects were aware of the danger of stroke and heart attack (n = 43 and n = 40 respectively). However, only three-fourths of the subjects perceived decreased chances of these complications as a benefit of treatment. "Poor" diastolic blood pressure control (> 90 mm Hg. over a 4 month period) is significantly associated with anxiety over complications (p < .01) and the perceived benefits of decreased probability of

stroke (p < .01) and heart attack (p < .02). The cost of medication(s) was a significant barrier (p < .01) for controlled subjects (diastolic blood pressure < 90 mm Hg.). A demographic profile and the duration of disease was not given in the published report.

The duration of disease may be related to the client's health perceptions at a given point in time. Powers and Wooldridge (1982) suggest that hypertensives diagnosed within the previous year may focus on the danger of possible negative consequences of the disease to such an extreme that they are less able to assimilate and recall the information and skills required for self care. Powers and Wooldridge base this conclusion on their factorial study design of educational programs among predominantly Black, women, with low income status, and lesser educations ( $\leq 8$ th grade)(N = 160).

Schulman (1979) reports on the degree of "active patient orientation" (low, medium, or high) among hypertensive veterans and university clinic clients (N = 99). Findings indicate that clients who are afforded a high degree of active participation in ambulatory outpatient medical care are significantly (p < .03) more likely to have a controlled blood pressure (diastolic blood pressure < 95 mm Hg.) and to exhibit more positive attitudes to illness-management. For example: the belief that the treatment isn't exactly right is significantly (p < .01) associated with low client activation, which in turn is associated with an average diastolic blood pressure of at least 97 mm Hg.). Having a lot of faith in the clinic staff and believing that the hypertensive treatment is doing a lot of good are associated (p < .05 and p < .08) with high activation, which in turn is characterized by an average diastolic blood pressure of 92-93 mm Hg. The health beliefs and blood pressure control were not directly analyzed in this study. A demographic profile and the duration of disease for study participants are not given in the published report.

In summary, it is difficult to draw any conclusions from the two studies by Johnson (1979) and Schulman (1979) on the relationship between the benefits and barriers to the medication regimen and blood pressure control given the paucity of research, the lack of clarity in reporting treatment as pharmacologic and a combination of pharmacologic and dietary in the same study, and a failure in these published studies to control for demographic characteristics and the duration of disease. A discussion of the literature which contains information on the benefits and barriers to the diet regimen follows.

Benefits and Barriers (Commitment) to Diet Regimen

Until recently, dietary therapy did not seem to be a highly used mode of hypertensive therapy. Johnson (1979) reports that only thirtyseven percent of the forty- three hypertensive clients in a Colorado Family Practice Residency Program received dietary recommendations. Residents reportedly disclosed they would prefer to administer a saltdepleting diuretic rather than "burden" the client with severe food restrictions.

The Working Group of Critical Patient Behaviors in the Dietary Management of High Blood Pressure (1981) has encorporated the concepts of benefits and barriers into a ten-step approach for controlling sodium intake and weight. This interdisciplinary group operationalized the terms benefits and barriers, or commitment, to include making and sustaining dietary change through the achievement of small, slow, and steadily progressive goals. The immediate benefits of therapy to the

individual are emphasized over the long term barriers of therapy to foster increased motivation. The barriers present in the physical, social, and cognitive environments are gradually overcome. The ultimate aim of the diet regimen is not perfection, but improvement in low adherence rates. Temporary set backs, lapses in adherence, and deferred dietary therapy are to be accepted as a part of the change process and are not necessarily indicative of treatment failure.

The Critical Patient Behaviors in the Dietary Management of High Blood Pressure (1981) have, in part, been based on the work of Glanz. Glanz (1979) identifies dietary barriers such as food cost, access to the proper foods, and the skill, time, and effort necessary for food preparation as the client attitudes associated with higher levels of dietary noncompliance. Although Glanz includes the health status of the client as an outcome measure of her model of the dietician's counseling process, no measure of health outcome was operationalized in the pilot study (1979) of characteristics of clients (N = 20) who were counseled by dieticians. No published study was retrieved which addressed the relationship between the benefits and barriers to a dietary regimen and blood pressure control.

Due to the lack of research on the dietary beliefs of hypertensives, this literature review was expanded to include the dietary beliefs of other conditions. The most enlightening study is reported by Becker et al. (1977) who applied the health belief model to predict dietary compliance for parents of obese children (N = 182) ages nineteen months to seventeen years. Becker et al. (1977) report that the benefits and barriers to following a diet plan are less predictive of dietary

compliance than other health beliefs. The parent's general concern about the child's health, the threat of obesity, and the perceived negative health consequences of being overweight initially predicted dietary compliance. Diet safety and specific concerns and feelings about weight seem to become increasingly important overtime. The parents initially identified dietary regimen barriers of inconvenience, expense, conflict with family food preferences, and social occasions. However, these barriers were apparently not relevant to compliance behaviors anytime during the twelve month intervention. Becker et al. (1977) suggest that clients may not be able to identify prospective barriers to a dietary regimen. In addition, the health perceptions would seem to be time specific factors in the Becker et al. (1977) study.

In summary, the relationship between the expressed benefits and barriers to a diet regimen are not addressed in the blood pressure control literature. It would seem that hypertensives who perceived positive benefits of the medication and/or dietary regimen(s) and few barriers to implementing therapy should be more likely to have a controlled blood pressure. This conclusion remains to be experimentally validated.

Further research is needed to clarify the relationships between the health perceptions and clinical outcomes due to four limitations in the currently available literature. First, the concept of benefits and barriers is difficult to operationalize since it is reflective of the complex concept of motivation (Mikhail, 1981). Second, the temporal and health condition specific patterns of the health perceptions remain unknown. Since most people tend to aspire to goals that are close or

slightly higher than their past performances, research needs to contain data on the client's health history and past experiences (Mikhail, 1981). The present research would seem to focus on the client's expressions of his/her present subjective world. Third, changes in compliance may precede rather than follow alterations in the health perceptions as based upon the generally weaker relationships between the health perceptions and compliance in prospective studies as opposed to the findings in retrospective studies (Sackett and Haynes, 1976). And finally, the relationship between the health perceptions and the ultimate clinical outcome needs to be clarified. A discussion of the literature containing information on the relationship between knowledge of disease and the therapeutic regimen and blood pressure control follows.

#### Knowledge

Over the past ten years, research studies and literature reviews have reported that knowledge of disease and the therapeutic regimen contribute less to clinically desirable compliance behavior(s) than does beliefs about the seriousness of disease and the benefits and barriers to following prescribed treatment across varied educational interventions and populations (Tagliacozzok Luskin, Lashof, and Ima, 1974; Sackett and Haynes, 1976; Langlie, 1977; Baile and Gross, 1979; Daniels and Kochar, 1979; Nelson, Stason, Neutra, and Solomon, 1980; Given and Given, 1981; Glanz, Kirscht, and Rosenstock, 1981; and the Working Group on Critical Patient Behaviors in the Dietary Management of High Blood Pressure, 1981). Some examples of this conclusion follow.

Tagliacozzo, Luskin, Lashof, and Ima (1974) report on the effect of educational strategies upon medication compliance among Chicago, hospital outpatients (N = 192), with at least one chronic disease. These researchers found that symptom sensitivity and symptom experience appeared to play an important role in medication taking behavior. Educational interventions and reassurance from nurses had minimal impact on medication compliance.

Baile and Gross (1979) reviewed the results of the Veterans Administration Studies and recommend that in addition to assessing client knowledge, an inquiry be made into the client's perception of the meaning of the hypertensive diagnostic label; the treatment regimen and its impact on family, job status, and self-image; as well as the client's reaction to past diagnosis. The assessment of the client's perceptions is purported to achieve the identification of the barriers to treatment and therefore, lead to a more individualized treatment plan.

Daniels and Kochar (1979) report that "there is no clear relationship in the literature between a person's knowledge of the disease process (and treatment) and adherence rates" (p. 238). Knowing facts cannot be equated with taking appropriate health actions because different individuals may perceive and respond to the same educational message in various and unexpected ways.

No statistically significant relationship between educational approaches and blood pressure control is reported in studies by Webb (1980), Tanner and Noury (1981), and Powers and Wooldridge (1982).

Webb (1980) studied the effectiveness of patient education and psychosocial counseling in promoting blood pressure control among low income, rural, black, hypertensives (N = 123). Three one hour

educational sessions were conducted at monthly intervals. Webb reports that neither education concerning both disease and treatment nor counseling produce a significant increase in medication compliance and blood pressure control.

Tanner and Noury (1981) studied the effect of structured teaching about essential hypertension on the control of the diastolic blood pressure (< 90 mm Hg.) among hypertensives (N = 30), one half of whom were assigned to an experimental teaching program. Tanner and Noury report that structured teaching had no significant effect upon diastolic blood pressure control. Instruction significantly increased knowledge (p<.05) but not blood pressure control.

Powers and Wooldridge (1982) studied factors influencing knowledge, attitudes, and compliance of predominantly female, black, hypertensives (N = 160), forty-six percent of whom possessed lesser educations ( $\leq 8$ th grade). Although as a whole, clients in the educational program tended to reduce their blood pressures, there were no statistically significant effects of the educational approach on diastolic blood pressure control (< 90 mm Hg.).

A profile of clients, by demographic characteristics, responding to particular educational interventions is not evident in the literature to date. It has been suggested that educational interventions may have a synergistic effect with other behavioral strategies such as tailoring and reinforcement (Baile and Gross, 1981). In addition, knowledge may tend to be a poor predictor of compliance behavior among clients who are already motivated to seek out medical care (Tagliacozzo and Ima, 1970); those already knowledgeable about their illness; those with multiple health problems, high anxiety, favorable attitudes toward the clinic staff; or those who perceive their illness as serious (Tagliacozzo, Luskin, Lashof, and Ima, 1974). A profile of clients responding to particular educational interventions is necessary for cost-effective and quality nursing care.

In summary, knowledge of disease and therapy is not associated with blood pressure control in three published studies (Webb, 1980; Tanner and Noury, 1981; and Powers and Wooldridge, 1982). A discussion of the literature which contains information on the relationship between compliance behaviors and blood pressure control follows.

## Compliance with the Therapeutic Regimen

Overall compliance with antihypertensive therapy is related to blood pressure control. For example: the multidisciplinary Working Group (Haynes et al., 1982) reports that fifty percent of the new hypertensives do not follow through with referrals for care. Fifty percent of those new hypertensives who do seek out care, drop out of therapy within one year. The remaining two-thirds of all hypertensives who stay under care, approximately twenty to thirty percent of all known hypertensives, achieve adequate blood pressure control. A discussion of the relationship between medication compliance and blood pressure control follows.

## Medication Compliance

The association between medication compliance and blood pressure control is well documented in a variety of research designs and populations. Some examples of the more recent compliance literature follow. Eight published studies (Nelson et al., 1978; Daniels and Kochar, 1979; Dove and Schneider, 1980; Haynes et al., 1980; Hershey, Morton, Davis, and Reichgott, 1980; Inui et al., 1980; Wagner, Truesdale, and Warner, 1981; and Shulman et al., 1982) contain information on the relationship between medication compliance and lower diastolic blood pressure measurements.

Nelson et al. (1978) studied the impact of patient perceptions on compliance behavior among hypertensives (N = 142). Compliance was measured in terms of blood pressure control, self-reported medication taking, and appointment keeping. Blood pressure control ( $\leq$  90 mm Hg.) and self-reported medication taking were highly correlated with each other (p = .02). Seventy-four percent of the subjects who reported missing no medications over the previous twenty-eight days and forty-nine percent (n not specified) of those subjects who reported missing one or more doses in the previous twenty-eight days, had a controlled diastolic blood pressure.

Daniels and Kochar (1979) report on the compliance behaviors of metropolitan Milwaukee subjects in the blood pressure control program. Although eighty-nine percent (n not specified) of the subjects continued drug therapy, only sixty-seven percent had a controlled (not specified) blood pressure.

Dove and Schneider (1980) studied the quality of care among outpatient hypertensive veterans (N = 352). Of those "less severe" clients determined by a retrospective chart audit to be compliant with medication taking (n = 121), eighty percent achieved a controlled diastolic blood pressure (< 95 mm Hg. or  $\geq$  90 mm Hg. and  $\geq$  10 mm Hg. drop). Of those "less severe" hypertensive subjects judged noncompliant with medication taking (n = 21), fifty-eight percent achieved a controlled diastolic blood pressure. Among veterans with more "severe" disease

states (having more changes in the drug regimen), fifty-eight percent of the compliant (n = 75) and thirty-seven percent of the noncompliant (n = 18) veterans achieved blood pressure control. The association between this "crude" measurement of compliance and diastolic blood pressure control was significant (p < .05) for both the "less severe" and "severe" hypertensives.

Haynes et al. (1980) studied clinical measurements of compliance among newly treated hypertensive male, Hamilton steelworkers (N = 134) during the first six months of therapy. Client self-reports of medication taking significantly correlated with pill counts (r = .74, p < .001). Pill counts also correlated with blood pressure (r = .17, p < .025). Of study subjects with controlled blood pressures (diastolic < 95 mm Hg.) (n = 64), sixty-seven percent (n = 43) were compliant with medication-taking whereas forty-six percent of those whose blood pressure remained elevated ( $\geq 95 \text{ mm Hg.}$ ) were compliant (p < .025). However, blood pressure reduction was not in itself predictive of compliance as forty percent of the subjects were misclassified into blood pressure control groups when blood pressure reduction was used as a measure of compliance.

Hershey, Morton, Davis, and Reichgott (1980) report on the self-reported medication-taking behavior of Pennsylvania hypertensives (N = 132) who are predominantly black, females, with over one half of the sample reporting an income of less than \$5,000 annually. Of the subjects, a majority (n = 82) indicated they took their medication(s) "always," one-third of the subjects (n = 45) indicated "most of the time," and five subjects said "some of the time." It is interesting to note that seventeen of the subjects who reported "always taking" medications, indicated to their provider that they had missed one or more pills in the previous week. These researchers report a positive relationship between compliance and blood pressure control. Seventy-five percent of those subjects reporting they "always" comply and fifty-three percent of those reporting they do not always comply, had controlled diastolic blood pressures ( $\leq 90 \text{ mm Hg.}$  for ages 20-39 years;  $\leq 95 \text{ mm Hg.}$  for ages 40-59; and  $\leq 100 \text{ mm Hg.}$  for 60 years and older). The difference in percents of clients always taking medication (n = 65) and not always taking medication (n = 67) who achieved diastolic blood pressure control was twenty-two percent (p < .02). Those subjects who missed more than three pills in an average week (28% of whom had a controlled diastolic blood pressure) were significantly (p < .01) less likely to have a controlled blood pressure than those who missed no pills in an average week (75% achieved a controlled diastolic blood pressure).

Inui et al. (1980) studied variations incompliance (pharmacy record audits of medication refills) with twenty common long-term drugs prescribed for outpatient veterans (N = 419) in Seattle. A significant negative correlation (r = -.63, p < .05) existed between hydrochlorothiazide compliance and diastolic blood pressure. In other words, higher degrees of compliance achieved lower diastolic blood pressures, and lower degrees of compliance resulted in higher diastolic blood pressures. The blood pressure response in mm Hg. is not given in the published report.

Wagner, Truesdale, and Warner (1981) report on compliance, treatment practices, and blood pressure control among treated hypertensives (N = 385) in a rural biracial community. Diastolic blood pressure control

(< 90 mm Hg.) was significantly better among compliars (self-reports of never or rarely missing doses) than for noncompliars (70% vs 61%, p < .05). However, among those subjects whose diastolic blood pressures were elevated, two-thirds (n not given) were compliant with medication taking.

Shulman et al. (1982) correlated the attendance and compliance behaviors of subjects (N = 10,940) in the Hypertension Detection and Follow-Up Program from fourteen communities. Medication compliance (pill counts) correlated with blood pressure control (goals diastolic blood pressure for individual). Among those subjects failing to return their pills for counting at the one year period after enrollment into the study, a fourteen percent drop in the average diastolic blood pressure was observed. A seventeen percent drop in the diastolic blood pressure was observed for those with a medication taking adherence index of less than eighty percent. A nineteen percent drop in the diastolic blood pressure was recorded for those persons with at least an eighty percent adherence index.

One study by DeVon and Powers (1984) contains evidence contrary to the reported relationship between compliance and blood pressure control. DeVon and Powers studied the health beliefs, adjustment to illness, and control of hypertension among well educated, predominantly white, middle to upper class, Chicago suburban, hypertensives using the Standardized Compliance Questionnaire developed by Sackett et al. (1976). Self-reported medication compliance was not significantly associated with blood pressure control (based on provider judgment). No significant correlations were reported between compliance and age, sex, marital status, education, or duration of hypertension. In summary, medication compliance is reported to be significantly associated with blood pressure control in eight of nine studies by Nelson et al. (1978); Daniels and Kochar (1979); Dove and Schneider (1980); Haynes et al. (1980); Hershey, Morton, Davis, and Reichgott (1980); Inui et al. (1980); Wagner, Truesdale, and Warner (1981); and Shulman et al. (1982). It can be inferred from the above studies that seventy to seventy-five percent of those persons who always take their medication(s), will achieve blood pressure control, probably over a period of six to twelve months. Among persons who take medication(s) less than all the time, twenty-eight to thirty-nine percent will still achieve a controlled diastolic blood pressure. For those persons with an uncontrolled diastolic blood pressure after pharmacologic therapy, forty-six to fifty-three percent of these persons are compliant with medication taking. Medication taking seems to be associated with a controlled blood pressure.

One study by DeVon and Powers (1984) contains data to suggest that a nonsignificant relationship existed between medication-taking and blood pressure control among middle to upper class subjects. The demographic characteristics and duration of disease are not reported consistently across studies, making it difficult to identify trends in blood pressure control across various genetic, environmental, and disease duration samples. A discussion on the relationship between compliance with the diet regimen and blood pressure control follows.

## Dietary Compliance

Levels of compliance with a dietary regimen are generally assumed to be lower than medication compliance rates (Sackett and Haynes,

1976). Becker et al. (1977) suggest that dietary compliance is unusual when compared to other compliance behaviors for three reasons: (1) the health threat is not of an immediate nature, but is future oriented; (2) appropriate dietary behaviors may be undertaken for non-health reasons, such as social pressure; and, (3) the weight reduction goal may not be regarded as illness or health-related.

This portion of the literature contains two pertinent studies (Glanz, Kirscht, and Rosenstock, 1981; and Kaplan et al., 1982) on the relationship between dietary compliance and blood pressure control.

Glanz, Kirscht, and Rosenstock (1981) studied the dietary compliance behaviors of Michigan hypertensives (N = 432). Twenty-six percent of the respondents (n = 111) reported compliance to dietary sodium restrictions, with twelve percent (n = 52) of the total respondents achieving recommended weight loss.

Kaplan et al. (1982) studied two techniques (overnight urine collections and chloride titrator sticks) to improve adherence to dietary sodium restriction in the treatment of hypertension over a six month period among predominantly black, middle aged, low socioeconomic status, Dallas participants (N = 56). At the end of six months, sixty-eight percent (n = 38) of the subjects achieved the goal of reduction of dietary sodium intake by one-third, reflecting a significant degree of sodium restriction. This same sixty-eight percent of subjects also had an eleven mm Hg. reduction in the average blood pressure (p < .002).

Dietary compliance was not specifically addressed in these two studies to clarify those factors which may have influenced the client's outcome. The Kaplan et al. (1982) study did control for weight loss and alterations in the pharmacologic regimen, both reported not

to be significantly related to blood pressure reduction.

In summary, the limited research on dietary compliance behavior is not clear as to the relationship between compliance levels and blood pressure control. The relationship between these two concepts remains to be empirically tested. A discussion on the relationship between exercise compliance and blood pressure control follows.

### Exercise Compliance

No apparent definitive human studies exist which support the assumption that hypertension can be controlled with exercise alone (Solomon, 1981; Froelicher, 1982; Kottke, Caspersen, and Hill, 1984). Much of the exercise research literature focuses on its physiologic and psychologic benefits (Chrysant, 1978; Naughton, 1978; Sannerstedt, 1978; and Froelicher, 1982). The current research literature does not describe those persons who can be pursuaded to exercise and the resultant alterations in their self-concepts, compliance behaviors, and clinical outcomes as a result of a regular exercise regimen. In addition, the causes for the cessation of exercise programs have not been studied (Goodrick, 1978).

No research literature was retrieved that addressed the relationship between exercise compliance and blood pressure control. The following two studies (Boyer and Kasch, 1970; and Mulder, 1981) are the most pertinent studies to exercise compliance.

Boyer and Kasch (1970) studied exercise therapy in hypertensives (N = 23) and normotensives (N = 22). A controlled exercise program, under the direct supervision of a physician and an exercise physiologist was carried out for six months of outpatient care. An average reduction in the diastolic blood pressure of 11.8 mm Hg. and in the

systolic blood pressure of 13.5 mm Hg. was achieved among the hypertensives. An average reduction in the diastolic blood pressure of 6 mm Hg. was achieved for normotensive subjects. No change was reported in the systolic blood pressure after six months of exercise for normotensives. The relationship between other components of hypertensive therapy, medications, diet, and other life style modifications were not reported in the published study.

Mulder (1981) studied compliance to individualized home exercise programs for Grosse Pointe, Michigan hospital outpatients (N = 29) who had: acute or chronic diseases, cardiac abnormalities, or psychiatric problems. An exercise prescription (75% to 85% of maximal heart rate for 15 to 60 seconds) was ordered at least three times per week. Fifty-five percent (n = 16) of the subjects achieved exercise compliance (> 75% of exercise prescription) at thirty-two weeks after entry into the study. Thirteen percent (n = 14) achieved intermediate compliance (self-reported > 24% to  $\leq$  75% of exercise goal), and thirty-one percent (n = 9) were noncompliant (< 25% exercise goal) at thirty-two weeks. No correlation between exercise compliance and clinical outcomes was reported.

In summary, the relationship between exercise compliance and blood pressure control is not addressed in the research literature to date. A brief update follows on recent critiques on the health belief model.

#### Critique of the Health Belief Model

Modifications in the original health belief model are recommended by Dimatteo and Dinicola (1982), Pender (1982), and Ajzen and Fishbein (1980). Dimatteo and Dinicola (1982) report the strength of the health belief model to lie in its delineation in the important role of health

motivation and health perceptions. However, the health belief model does not by itself provide a sufficiently complete basis for understanding health behavior and for developing clinical interventions (Dimatteo and Dinicola, 1982). Pender (1982) and Ajzen and Fishbein (1980) propose alternative models of health decision-making.

Pender concludes that the current research data are insufficient to support the idea that the health belief model explains health promotion behaviors and lifelong health maintenance behaviors. In other words, Pender would not support the implementation of this study's conceptual model for studying hypertension. Pender presents an adaptation to the health belief model called a "health promotion model." Pender's model expands the individual's health perceptions to include: the importance of health, perceived control over health, the desire for competency, self-awareness, self-esteem, a definition of health, the perceived health state, and the perceived benefits of positive health habits. Knowledge of disease and therapy have been eliminated from the health promotion model. The Pender model concludes with the likelihood of taking health actions. No feedback mechanism for altering individual perceptions in the phases of decision-making and taking health actions is included in the model. Measures of health outcomes, such as compliance or disease control, are not contained in the Pender model. In summary, Pender expands the operationalization of the health perceptions while deleting the concepts of knowledge, compliance, and health outcomes. The applicability of Pender's model to the clinical management of hypertensives remains to be empirically validated.

Ajzen and Fishbein (1980) propose a "theory of reasoned action" whereby health beliefs combine with goal expectations to form health

attitudes. Attitudes do not in themselves bring about health behaviors. Attitudes purportedly combine with social norms to produce an "election" of the desired health behavior.

In summary, the recommendations of Pender (1982) and Ajzen and Fishbein (1980) do broaden the understanding of the individual's health perceptions and selected modifying factors contained in the health belief model (the structural need to adopt new behaviors, the attitudes of significant others, and the enabling factor of advice). However, the original health belief model contained broal categories of individual health perceptions and modifying or enabling factors into which the Pender, Ajzen, and Fishbein concepts could be placed. A summary statement of the review of literature follows.

### Summary

A profile of those clients most likely to make the most and least progress toward blood pressure control can be extrapolated from the literature. Those hypertensives making the most progress toward blood pressure control are expected to be of older age (age at least fifty years), female, and have a family income of at least \$6,000 annually, have a minimum of a high school education, have a duration of disease of less than five years, possess a high commitment to medication and diet regimens, and report medication compliance rates of always taking medication(s). Hypertensives making the least progress toward blood pressure control can be expected to be of younger age (less than age fifty), male, have a family income of less than \$6,000 annually, have less than a high school education, possess lower commitment to medication and diet regimens, and report a medication compliance rate of less than always taking medication(s). Race and knowledge of disease and

therapy are not expected to be related to blood pressure control. The relationship between blood pressure control and occupation, disease duration, the number and mean severity of symptoms, and reported compliance to diet and exercise regimens is not clearly specified in the research literature and remains to be empirically tested. In Chapter IV the research design, methodology, and procedures utilized in this study will be presented.

## CHAPTER IV

## METHODOLOGY AND PROCEDURE

Persons with chronic diseases in similar clinical states may vary considerably in their ability to carry out daily activities, and may perceive their health states in very different ways. Therefore, a client's background, perceptions, and life-style may affect his/her compliance behaviors and ultimately, his/her ability to minimize the risk of developing hypertensive related cardiovascular complications (Given, 1977).

The National High Blood Pressure Education Program is succeeding in the detection of hypertension and in the selection of an appropriate treatment regimen. However, much work remains to be done by professionals to ensure that client's acquire the necessary skills to manage lifelong treatment regimens (Levy, 1979).

This study is designed to determine if sociodemographic factors and selected concepts from the health belief model (health perceptions, knowledge of the therapeutic regimen, and compliance with that regimen) are predictive of the subjects' ability to lower the diastolic blood pressure after an experimental nursing intervention designed by Given (1981). The practical significance of this study lies in its ability to identify the client population for which the Family Clinical Nurse Specialist is able to make the greatest progress in assisting the client to minimize the risk of future cardiovascular complications. By

identifying the variables predictive of clients who would make the most and least progress in blood pressure control, the Clinical Nurse Specialist should be better able to select and clinically manage a caseload of clients for which s/he can be the most clinically effective provider.

The purpose of Chapter IV is to present the methodology and procedures which were utilized in this thesis. Within the chapter the hypotheses, operational definitions, sample selection procedures, summary of the experimental nursing intervention, instrumentation, scoring procedures, data collection procedures, statistical techniques used in the data analysis, and human rights protection will be presented in detail. A brief overview of the research methodology follows.

#### Research Methodology

A quasi-experimental approach was used for this study in which fifty-five of the eighty-eight experimental hypertensive subjects from the Given and Given research project (1977-1982) were selected for further study. One group of these subjects (n = 42) were those who had the greatest reduction in their diastolic blood pressure during the final nursing intervention session attended. The remaining subjects (n = 13) were those for whom the least alteration in diastolic blood pressure was achieved.

A multiple regression analysis was used to identify the variables that are predictive of clients who are capable of decreasing their blood pressure the most, and thus decreasing the severity of their hypertension and potential morbidity and mortality from cardiovascular related complications and diseases. The mean diastolic blood pressure was used as the dependent variable which determined the subject's assignment

into the two study groups. The independent variables selected for group differentiation include: sociodemographic characteristics (age, sex, race, client income, education, and occupation); client perceptions of disease severity; the combined benefits and barriers to therapy; knowledge of the therapeutic regimen and disease; and self-reported compliance to prescribed medication(s), diet, and exercise regimens during the six month nursing intervention. The variable included in this study in an attempt to control for disease severity was duration of disease. The concept disease severity could not be operationalized according to target organ involvement due to missing medical assessment data.

The problem statement, hypotheses, and operational definitions are presented next to describe the research methodology in detail.

### Statement of the Problem

Do differences exist in hypertensive subjects who are the most and least successful in making progress toward blood pressure control after an experimental nursing intervention with regard to the relationship among their health perceptions, their knowledge of disease and the therapeutic regimen, and stated compliance with that regimen?

#### Hypotheses

Given the hypertensive subjects who are the most and least successful in making progress toward blood pressure control after an experimental nursing intervention:

 It is not possible to differentiate between the two groups of subjects on the basis of <u>demographic</u> <u>characteristics</u> (age, sex, race, income, education, and occupation) and duration of disease.

- 2. It is not possible to differentiate between the two groups of subjects on the basis of the actual <u>number of symptoms</u> <u>reported</u> and the <u>perceived mean severity</u> of hypertensive symptoms at intake into the study.
- 3. It is not possible to differentiate between the two groups of subjects on the basis of the actual <u>number of symptoms</u> <u>reported</u> and the <u>perceived mean severity</u> of hypertensive symptoms at the sixth month interview.
- 4. It is not possible to differentiate between the two groups of subjects on the basis of the <u>expressed benefits and</u> <u>barriers</u> to following the therapeutic medication and diet regimens at intake into the study.
- 5. It is not possible to differentiate between the two groups of subjects on the basis of the <u>expressed benefits and</u> <u>barriers</u> to following the therapeutic medication and diet regimens at the sixth month interview.
- 6. It is not possible to differentiate between the two groups of subjects on the basis of their <u>overall knowledge</u> scores at intake into the study.
- 7. It is not possible to differentiate between the two groups of subjects on the basis of their <u>overall knowledge</u> scores at the sixth month interview.
- 8. It is not possible to differentiate between the two groups of subjects on the basis of <u>self-reported compliance</u> rates for medication taking, diet, and exercise in nursing intervention sessions I, III, IV, V, VI, and VII.

### Operational Definitions for Independent Variables

The following operational definitions have been adapted from the Givens' research project previously cited (1977).

### Demographics

Information about six client background characteristics were collected for use in this study. Age, sex, and race were included as risk variables for hypertension. The research literature on hypertension indicates that age, sex, and race are related to both the prevalence and severity of disease. Family income, education, and occupation were used as indicators of social and economic status.

#### Duration of Disease

In an attempt to control for disease severity, which is related to the client's probable progress in achieving blood pressure control, the duration of diagnosed hypertension was elected by asking clients to identify the length of time they had hypertension.

#### Perceived Severity of Disease

The subject's perception of severity of disease is defined as the expressed beliefs and attitudes of the patient concerning the effect of the condition upon present and future health states. A patient's perception of the severity of disease depends upon his/her experience with that disease. (Given, 1977 p. 28)

Multiple dimensions of perceived severity of disease could be measured. Only the subject's expressed number of symptoms and the mean severity of symptoms were used in this study. These two dimensions of severity lend themselves to efficient data collection during client screening procedures in clinical practice. 90

### Perceived Benefits from the Therapeutic Regimen

The subject's perception of benefits from the treatment regimen is defined as " ... the expressed beliefs and attitudes concerning the efficacy of each medication, dietary restriction or behavioral change, the care provided at follow-up and the long term effect of the regimen upon the disease process ... (Given, 1977 p. 29)." In order to measure perceptions of benefits, subject's were asked to identify the extent to which medications and diet influenced the disease process. Perceived Barriers to the Therapeutic Regimen

The subject's perceptions of barriers to the treatment regimen is defined as " ... the expressed beliefs and attitudes of the patient concerning the barriers to undertaking aspects of the therapeutic regimen (Given, 1977 p. 30)." Two dimensions of barriers to carrying out elements of the therapeutic regimen were examined: (1) cost, inconvenience or change in life style; and (2) side effects and discomfort.

For the purpose of this proposed study, the variables of benefits and barriers to the therapeutic regimen have been combined upon the recommendation of B. Given since early data analysis suggests some embiguity in the concept of perceived benefits. Only the subjects' commitment to diet and medication(s) was studied. Three additional belief scales were used in the Givens' research project (1977-1982). Knowledge of Disease and the Therapeutic Regimen

The subject's knowledge of disease is defined as the factual information clients recall and report in response to questions concerning symptoms, etiology, natural course of disease, prognosis, and possible complications of hypertension.

The subject's knowledge of the therapeutic regimen is defined as

... the factual information patients recall and report in response to specific questions concerning medications (name, purpose, dosages, expected results, precautions and possible side effects); diet (purpose, acceptable/unacceptable foods, acceptable/unacceptable levels of caloric intake); behavioral modifications (smoking, alcohol, rest and exercise); prescribed follow-up visits; and critical symptoms of complications to be reported. (Given, 1977 p. 28)

#### Compliance with the Therapeutic Regimen

The subject's compliance with the therapeutic regimen is defined as the extent to which the client carries out the therapeutic recommendations of all health care providers concerning the prescribed medication(s), diet, and behavioral modifications.

A previous section in Chapter II documented the difficulties involved in obtaining reliable measurements of client compliance. In this study, measures of compliance were based on self-reported compliance rates as obtained by the nurse intervenors during nursing intervention sessions I, III, IV, VI, and VII. The nurse intervenor asked each subject to indicate the extent ("all the time," "more than  $\frac{1}{2}$ the time," " $\frac{1}{2}$  the time," "less than  $\frac{1}{2}$  the time," or "none of the time,") to which s/he observed the prescribed medication(s), diet, and exercise regimens.

# Operational Definition for the Dependent Variable Diastolic Blood Pressure

The reporting of diastolic blood pressures has never been satisfactorily standardized. For this research, the American Heart Association's definition of diastolic blood pressure as the muffling point was used.

The selection of study subjects, a brief overview of the Given (1981) experimental nursing intervention as received by all subjects in this study, research settings, and instrumentation follow to complete the discussion of research methodology.

### Selection of Hypertensive Subjects

#### Givens' Study Population

Hypertensive subjects are those adults eighteen to sixty-five years of age who are being treated in a primary care setting for diagnosed essential hypertension, who are literate, and are on a prescribed diet or medication regimen. Subjects excluded from the study included those with diagnosed disease (i.e., cancer, end-stage renal disease, blindness, psychosis or present treatment for a psychiatric problem, pregnancy (or lactation), or stroke) other than that resulting from hypertension itself, of the target organs (Given, 1977). By excluding these subjects, the assessment of target organ involvement in the Givens' study should reflect those changes occurring secondary to hypertension. In addition, to be eligible for inclusion, the medical records had to include two blood pressure readings taken at least two months apart; name of medication(s), dosage, and the date prescribed and/or the type of diet prescribed; and two body weights taken at least two months apart. Finally, hypertensive clients had to have had either a systolic pressure of 160 mm Hg. or above and a diastolic pressure of 95 mm Hg. or above on more than one occasion in previous clinic visits.

The population was identified by means of computerized data contained in the health information systems in three family practice residency training centers and by means of client lists drawn up by four private physicians in two practices. Medical record auditors, using a standardized form and set of criteria, abstracted data from the medical records of hypertensive clients at the above sites to determine if they were eligible for enrollment into the study. After eligibility

was established, potential participants were sent a letter by the Medical Director of the center at which they received care. (See Appendix B) This cover letter described the study, explained the benefits to be derived from it, and asked the client to participate. If the client agreed to participate, s/he was asked to schedule an appointment to be interviewed. Interviewers met with potential participants individually to explain the study to them, obtain their written consent to participate (See Appendix C), supervised the administration of self-administered questionnaires, and personally interviewed them using a standardized, closed-ended instrument.

During the experiment, all subjects received stand care from health providers as outlined by the Medical Advisory Panel. In addition, the subjects randomly assigned to the experimental study group received eight nursing intervention sessions. The experimental nursing intervention was designed to assist clients to contribute more effectively in the control of hypertension.

The following section describes the procedure for the identification of the most and least successful clients in making progress toward blood pressure control.

#### Study Sample

For this study, fifty-five of the eighty-eight experimental hypertensive subjects from the Givens' research study were selected for further data analysis. Subjects for this study must have attended six of the eight nursing intervention sessions. One group (n = 42) of these subjects were those who had the greatest reduction in diastolic blood pressure as measured in mm Hg. The remaining group of subjects (n = 13) were those for whom the least alteration in the diastolic

blood pressure was achieved. The mean diastolic blood pressure measurement was selected as the sole dependent variable to classify the subjects into the two sudy groups. The procedure for calculating blood pressure alteration follows. (See Appendix A)

Blood pressure reduction was calculated by first determining the mean diastolic blood pressure from the screening and first nursing visit measurements for all eighty-eight of the Givens' experimental hypertensive subjects. For those subjects with a mean screening and pretest (first nursing visit) diastolic blood pressure of greater than 90 mm Hg. and having attended at least six of the eight nursing intervention sessions (N = 57), study group eligibility was determined. Two subjects eligible for group assignment had missing data on the self-reported compliance rates and were therefore excluded from group assignment and analysis.

The mean diastolic blood pressure measurement from the final nursing intervention session attended (session VI, VII, or VIII) was subtracted from the mean diastolic blood pressure at screening and pretest. The difference scores were summed and the group median was calculated. The study sample was split at the median (-1 mm Hg.) for group assignments. Those eligible subjects who had a reduction in their mean diastolic blood pressure of at least -1 mm Hg. were the most successful in making progress toward blood pressure control (n = 42). Those who had no change or an increase in their mean diastolic blood pressure were those who were the least successful in making progress toward blood pressure control (n = 13).

In conclusion, subjects making the most progress toward blood pressure control had a mean diastolic blood pressure of 96.98 mm Hg.
with a standard deviation of 4.01 at the pre-intervention (average of screening and first nursing intervention session) measurement. At the post-intervention blood pressure measurement, the most progress group had a mean diastolic blood pressure of 85.95 mm Hg. with a standard deviation of 7.21. The mean diastolic difference (post-intervention measurement minus pre-intervention measurement) was a negative 11.02 mm Hg. for the most progress group. Subjects making the least progress toward blood pressure control had a mean diastolic blood pressure of 95.15 mm Hg. with a standard deviation of 4.00 at the pre-intervention measurement. At the post-intervention blood pressure measurement, the least progress group had a mean diastolic blood pressure of 97.85 mm Hg. with a standard deviation of 4.20. The mean diastolic difference was a positive 2.69 mm Hg. for the least progress group. The most progress group subjects had an 11 mm Hg. mean decrease in diastolic blood pressures, taking the group mean to a normal diastolic blood pressure at the conclusion of the Given intervention. Subjects in the least progress group had a mean diastolic blood pressure increase of 2 mm Hg. during the Given nursing intervention.

This study methodology may be insufficient to satisfactorily discriminate between those subjects making the most and least progress toward blood pressure control. To date, no one method of satisfactorily delineating subjects according to blood pressure control has been reported in the research literature. For example: Dove and Schneider (1980) attempted to stratify hypertensives according to the initial level of the systolic and diastolic blood pressures. Blood pressure control was defined to be a diastolic blood pressure less than or equal to 95 mm Hg. with an overall drop in the diastolic blood pressure of

10 mm Hg. Dove and Schneider concluded that this methodology did not fully control for disease severity among their hypertensive veteran subjects (N = 352).

The rationale for selecting progress toward blood pressure control as the criterion variable is based upon the results from the Framingham Study and the 1980 Report of the Joint National Committee on Detection, Evaluation, and Treatment of High Blood Pressure. According to the general cardiovascular risk profile generated in the Framingham Study, the single most useful factor for detecting clients at high risk of cardiovascular disease is blood pressure, although it is not equally important for all types of cardiovascular diseases. Risk is reported to be proportional to the level of blood pressure elevation, indicating that there is no critical blood pressure value to indicate where normal and abnormal risk begins. Kannel et al. (1976) conclude that a steady increment of risk exists with increasing blood pressure. The 1980 Report of the Joint National Committee on Detection, Evaluation, and Treatment of High Blood Pressure purports that " ... long term reduction of blood pressure decreases overall mortality at all levels of hypertension." (p. 9) Other literature over the past fifteen years indicates that the amount of blood pressure decrease is directly proportional to the amount of decrease in the risk of cardiovascular diseases (Veterans Administration Cooperative Study Group: 1967, 1970, and 1972; Kannel et al., 1970; Kannel et al., 1972; Taguchi and Fries, 1974; Kannel, 1976; Kuchel, Mahon, McKenzie, and Ogilvie, 1979; Johnston et al., 1980: Morisky et al., 1980; and Rocella, 1983).

A brief description follows on the Given nursing intervention

which was designed to assist hypertensives to contribute more effectively in the control of their disease.

Overview of the Experimental Nursing Intervention

Eight standardized nursing intervention sessions were developed by B. Given (1981) and offered to all experimental hypertensive clients over a period of six months in the Given and Given research project (1977-1982). The goal of each nursing session was for the client and nurse to mutually identify problems and develop strategies to assist the client to carry out the health behaviors needed for their therapeutic regimen. These strategies included:

- Recognition by the client of prioritized problems that prevent achievement of compliance behaviors and blood pressure control.
- 2. Development of behavioral goals to overcome barriers to implementing the therapeutic regimen.
- 3. Development of specific solutions to overcome the problems that were identified.
- 4. Tailoring of the therapeutic regimen to the client's activities of daily living and social support system.
- 5. Shifting responsibility for monitoring health behaviors and decision-making to the client for ongoing management. (Given and Given, 1982)

Each nursing intervention session was directed toward problem-solving and mutual goal setting in relation to carrying out the therapeutic regimen and overcoming the barriers to these regimens. The overall aim of the sessions was to involve subjects actively in the identification of problems, problem-solving, by asking questions, selecting appropriate health behaviors, keeping diaries, and presenting management problems to the nurse intervenors. This approach was implemented to encourage each individual to assume the major responsibility for the ongoing control of his/her chronic disease (Given and Given, 1982).

To supplement the client-nurse interaction, booklets were prepared by the Givens' project personnel which provided information to the experimental study participants which provided information about hypertension and therapy. The information contained in the booklets was intended to assist in the development of appropriate health beliefs and to increase the participants motivation to actively partake in the management plan (Given and Given, 1982). (See Appendix D)

#### Settings

Data in the Givens' project was collected on eligible subjects from six different Michigan settings, three family practice training centers and two private family practice settings with a total of four practicing physicians. The family practice training centers were: E.W. Sparrow Hospital in Lansing; Grand Rapids Area Medical Education Center in Grand Rapids; and Saginaw Cooperative Hospitals Family Practice Center in Saginaw. Both private family practice settings were located in Kalamazoo.

## Instrumentation, Scoring, and Data Summarizing Procedures

The data collected during the Phase IV field experiment of the Given and Given research project <u>Patient Contributions to Care: Link</u> to <u>Process and Outcome</u>, funded by the Division of Nursing, Health and Human Services NU 0062-03, was used for this study. The data collection instruments were developed by the Givens' and were derived from their

operational definitions of the variables. Four Patient Interview Instruments and the standardized Nurse Intervenor Activity Records were selected to retrieve data on the study variables.

The following section describes these selected instruments and the scoring and data summarizing procedures. A report of instrument reliability and validity concludes this section.

# Selected Patient Interview Instruments

The Patient Interview Instruments collected information from each subject on each of the Givens' study variables. All questionnaire items were derived from existing measures. (See Appendix E)

#### Sociodemographics

The intake sociodemographic instrument is a self-administered questionnaire which gathers background information on the subject. This study retrieved data on six sociodemographic variables: age (item 2), sex (item 1), race (item 3), total family income (item 6), education (item 10), and occupation (items 8 and 9). The duration of disease measure (item 13) was used to identify the length of time the client has had hypertension. The subjects' reported chronological age in years was scored as reported. The variables of six, race, family income, education, occupation, and duration of disease were scored according to the predetermined categories of responses on the questionnaire.

# Severity Scale

The Hypertension Severity Scale is a sixteen item self-administered questionnaire which ascertains the symptoms and the severity of those symptoms which the subject has experienced during the past two weeks. Fifteen common hypertensive symptoms ("shortness of breath, chest pain,

rapid pounding and beating of your heart, ...") are listed for the subject's selection, as well as additional space for one other symptom.

Each subject responded "yes" or "no" to the fifteen common hypertensive symptoms. If the respondent selected "yes", s/he then ranked the severity of that symptom from very severe (5 points) to not severe (1 point) on a five point Likert scale. The same procedure was followed if the subject filled in a symptom not listed. Each respondent received two scores: an indication of the actual number of symptoms experienced in the last two weeks and a score for the mean severity of the symptom(s) reported.

## Belief Scales

The Givens' belief instrument established the client's beliefs about: the impact of the disease on his/her health; his/her efforts to control the disease; the extent of control; prescribed medication and diet; and personal factors (lifestyle) in disease control. The Givens (1982) used a confirmatory factor analysis, excluding missing data, to refine the fifty-one questionnaire items into five final item clusters. Two of these scales of item clusters were used in this study: Commitment to Medications (items 32 through 42) and Commitment to Diet (items 43 through 54).

Statements describing the subject's beliefs about the benefits of and barriers to medication taking and dietary restrictions were developed from indepth interviews on a convenience sample of thirty hypertensive clients. These persons were asked to talk about how they thought their medications and diet helped to control their hypertension, and to describe the major problems encountered in taking medication and remaining on their diets. The belief scales were developed from

thirty-seven client statements describing possible benefits of medications and diet and forty-one statements describing barriers to medication taking and dietary restrictions (Given et al., 1980).

Each subject responded to the medication and diet sections of the questionnaire on a five point Likert scale if that mode of therapy was specific to their own therapeutic regimen. Each item was scored from one to five points with a score of five indicating the most clinically desirable response, regardless of "strongly agree" or "strongly disagree" label.

Each subject received two belief scores: a score representing commitment to medications and a score representing commitment to diet. Some subjects had only one score since they had a therapeutic regimen consisting of either prescribed medications or diet. The highest possible score of 55 points on the medications scale represented a high commitment to taking prescribed medications as evidenced by a response of "strongly disagree" to item 23 and a response of "strongly agree" with item 28. The highest possible score of 60 points on the diet scale represented a high commitment to following the prescribed diet as evidenced by a response of "strongly disagree" to item 49 and a response of "strongly agree" with item 54.

#### Understanding Scale

The understanding (knowledge) scale, entitled "Understanding High Blood Pressure" is a forty item multiple choice questionnaire which determines the level of factual knowledge the subject has about his/her disease, complications, symptoms, diet, exercise, and medication. The multiple choice questions were developed from a review of client education materials and published and unpublished literature concerning what

hypertensive clients ought to know about: the control of disease, symptomatology, diet, purpose of medications, and side effects of medications (Given et al., 1980).

The nature of the instrument is such that the subject's responses to test items can be classified as "right" or "wrong" within the confines of the present knowledge base about hypertension. Ten percent of the test items have a difficulty ratio ranging from .05 to .95, necessary for identifying subjects who have a more complete grasp of medical facts as opposed to those with less complete knowledge. The subject received a +1 score for each correct answer and a score of 0 for each incorrect answer. The higher the total score, the more knowledgeable the subject is concerning hypertension.

In addition to the four selected Patient Interview Instruments, the records of the nurse intervenors were used to retrieve data on blood pressure measurements and compliance.

#### Nurse Intervenor Activity Record

The standardized Nurse Intervenor Activity Records were used to retrieve blood pressure measurements and compliance levels. Blood pressure measurements at nursing sessions I through VIII were retrieved for the sample selection procedure. Compliance data was retrieved from nursing sessions I, III, IV, V, VI, and VII to determine the subjects' self-reported compliance with prescribed medication(s), diet, and exercise over the duration of the experimental nursing intervention (Given, 1981).

Self-reported compliance data was scored on a scale from "all the time" (5 points), "more than  $\frac{1}{2}$  the time" (4 points), " $\frac{1}{2}$  the time" (3 points), "less than  $\frac{1}{2}$  the time" (2 points), and "none of the time"

(1 point) for medication taking, proper medication dosage, taking medications at prescribed time(s), following prescribed diet, and following recommended exercise. Not all aspects of compliance were assessed at each nursing intervention session. However, each aspect of compliance that was assessed was scored on the five point scale. Each subject received three final scores: a mean medication, diet, and exercise compliance score.

A discussion of instrument reliability and validity follows. <u>Instrument Reliability and Validity</u>

Given et al. (1982) report that the refined scales measuring their study variables are " ... stable and reproducible across samples, and have adequate internal and external consistency as measured by coefficients alpha and the inter-scale correlations (p. 16)."

Study Variable	Reliability	Methodology
Symptom Severity	.82	Cornbach's (1951) alpha
Beliefs about Commitment to Medications	•79	Cornbach's (1951) alpha
Beliefs about Commitment to Diet	.69	Cornbach's (1951) alpha
Knowledge of Hypertension	•63	Kuder-Richardson formula 20
Systolic Blood Pressure	•79	Test-Retest
Diastolic Blood Pressure	•78	Test-Retest

Table 1. DESCRIPTION OF INSTRUMENT RELIABILITY

In summary, the Givens' instruments when administered to their population according to their data collection procedures, produced satisfactory reliability coefficients. This indicates that repeated measurements of the concepts yielded little measurement error (Polit and Hungler, 1978).

Construct validity was established using factor analysis to identify clusters of related variables. The result is the identification and grouping together of different measures of the same underlying construct into scales or item clusters (Polit and Hungler, 1978). The following table reports on the construct validity of the belief scales used in this study.

TABLE 2. CONSTRUCT VAL	DITY OF	SELECTED	BELIEF	SCALES
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Scales			Inter-scale Correlations		
			Phase I	Phase II -	
Beliefs About Medications	Commitment	to	40	24	
Beliefs About Diet	Commitment	to	•47	ار .	

<u>Note</u>. Phase I = Administration of scales to sample of 154 hypertensives Phase II = Administration of scales to sample of 97 hypertensives

In summary, the two belief scales selected for study are not tapping similar constructs since the inter-scale correlations are relatively low to moderate. In the judgment of the Givens', all measures are content valid.

The techniques employed to collect, process, and analyze subject responses follow under the headings of data collection, data recording, and statistical analysis. Data Collection Procedure and Recording

Data was collected from three sources: (1) client interviews, (2) structured self-administered questionnaires, and (3) clients' medical records. This section describes the Givens' data collection procedures and data recording.

#### Design of Phase IV of the Givens' Field Experiment

Prior to the implementation of the nursing intervention protocol, the interviewers or record reviewers reviewed each subject's medical record and made appropriate entries concerning the medical plan of care on the Patient Interview Instrument of each client. On the basis of these entries, the interviewers or record reviewers interviewed each participant to establish baseline scores for knowledge and perceptions. This procedure was repeated at the end of the six month experimental intervention period in order to determine the effects of the experimental treatment upon the subject (Given, 1977).

The actual data collection procedure was implemented after potential subjects gave written consent to participate in the research project. Interviewers placed subjects in a private room and explained the content of the self-administered instruments. The interviewer was available if questions arose and periodically re-entered the room to check the subject's progress, allowing forty to seventy minutes for completion of questionnaires.

The interviewer collected the completed questionnaire, checked for omission of information, and gave them to project personnel for computer coding. The experimental nursing intervention was implemented after the intake questionnaires were completed.

The following section describes the training of the interviewers,

record reviewers, and nurse intervenors.

#### Training of Data Collection Personnel

Two training programs were implemented by the Givens' project personnel to train the interviewers or record reviewers and the nurse intervenors. Each of these programs is described below.

## Interviewer/Record Reviewer

The interviewers and record reviewers included three students from Michigan State University College of Nursing and specially trained interviewers. An intensive four-day training session was conducted by the research staff according to content and procedures approved by the Givens' Project Advisory Panel. An instruction manual was prepared for subject interviews. The training sessions emphasized practical applications involving medical records and simulated client interviews, using medical and nursing students as model participants. The training also emphasized the development of consistent performance among the interviewers and record reviewers until a minimum level of eightyfive percent reliability in the use of all data collection and scoring instruments was attained.

In order to assure that this level of performance reliability was maintained throughout the experimental intervention period, weekly visits by the research staff to the study sites were implemented to monitor the interviewers and record reviewers. One follow-up training session was given prior to the time of the six month subject interviews (Given, 1977).

## Nurse Intervenors

To assist the nurse intervenors on the implementation of appropriate nursing interventions for selected client problems, the

research staff developed Patient Intervention Sessions, written standardized forms contained in an orientation and training manual, that outlined in detail nursing interventions for each of the eight visits. These written forms included strategies for problems the subject may identify concerning his/her family and/or the therapeutic regimen. The nurse was free to use any strategy that she believed would effectively meet the subject's needs. In addidion, the training manual provided the nurse intervenors with a protocol for missed appointments, instructions for the use of the Nurse Intervenor Activity Forms, and a specific documentation procedure. These procedures and protocols were reviewed in an intensive one-day training session help at Michigan State University by the research staff. After the initial training, which also included simulated nursing sessions, a member of the research staff served as a resource person for each intervenor. On site visits were also made by the research staff to debrief the nurse intervenors, answer questions, allay any concerns the nurses had, and check their work against the written criteria in the training manual.

Two additional procedures are included: client--nurse--provider interaction and blood pressure measurement. These two procedures were implemented in each study site to standardize client management and data collection procedures.

#### Procedure for Client--Nurse Intervenor--Medical Provider Interaction

The experimental subjects reported to the study center for regularly scheduled visits and received the clinical routine of care (which may have included screening vital signs and contact with clinic staff). The subject's were placed in an examination room and seen by their medical provider (probably a physician). The nurse intervenor

accompanied the provider into the room, noting his/her questions, responses to the client, and medical treatment recommendations. After the provider left the room, the nurse intervenor implemented the systematic experimental nursing intervention according to protocol. Documentation of the specific nursing intervention was recorded in the client's record and on the Nurse Intervenor Activity Records.

## Procedure for Blood Pressure Measurement

The following procedure for the measurement of the auscultatory blood pressure was written by Given (1977) and implemented by the nurse intervenors. This procedure, however, was not implemented during the two screening blood pressure measurements.

Blood pressure should be measured in both arms after the patient has been supine for five minutes. A disparity of 10 mm Hg. in systolic or diastolic between the two arms should be confirmed by repeated measurements in both arms. If there is no disparity in blood pressure between the two arms in the supine position, it is unnecessary to measure it in both arms while standing. Standing blood pressures should be measured after the patient has been standing for at least 60 seconds (Fries, 1974; Ayers et al., 1973; Gifford, 1974; Brook, 1973; and Dustan, 1973). Given, 1977.

In an attempt to minimize measurement error prior to the implementation of this procedure, the mean of the two screening blood pressure measurements was used in the calculations to determine study eligibility.

The following section describes the statistical analysis, data processing, and the rationale for the selection of statistical techniques.

#### Statistical Analysis

Experimental data for this study was obtained from fifty-five Michigan hypertensives. Information on twenty variables was collected via the Patient Interview Instruments and the Nurse Intervenor Activity Records. In order to make the results more intelligible, a stepwise multiple regression technique was employed.

#### Multiple Regression

A multiple regression analysis is one multivariate correlational method used to understand the strength of relationships between two or more independent variables upon a single dependent measure. In this study, the dependent variable is the mean diastolic blood pressure for those hypertensives making the most and least progress toward blood pressure control after an experimental nursing intervention. The mathematical objective is to weight and linearly combine the descriptive variables (sociodemographic characteristics and duration of disease) and the independent variables (knowledge, health perceptions, and compliance) in some fashion to discriminate between the two study groups. This regression procedure determines whether two or more of the independent variables can be combined to predict blood pressure control better than any one statistically significant independent variable (Borg and Call, 1979; Polit and Hungler, 1978).

The aim of any correlational study is to gain a better understanding of the complex set of factors which may influence the dependent variable under study. Therefore, low correlation coefficients (r < .35) are as meaningful as high coefficients (r > .65) (Borg and Gall, 1979). In addition, statistical significance is less important than practical significance since correlations usually must exceed the point of statistical significance to be of academic value (Polit and Hungler, 1978).

Two major limitations of correlational techniques do exist. The first limitation is that cause and effect relationships cannot be

established. In addition, upon repetition of correlational studies, predictive validities tend to decrease. This is primarily due to the repetition whereby chance preditive relationships are not likely to be present. Thus, the initial correlation may become smaller or disappear. Cross validation of study findings is recommended on another sample of subjects prior to the clinical application of correlational study findings to determine shrinkage of the original multiple regression coefficients (Borg and Gall, 1979).

The findings from this study contribute toward the classification of hypertensive clients into groups to indicate their probable progress toward blood pressure control prior to the implementation of the Given (1981) nursing intervention. This predictive information should be useful to Clinical Nurse Specialists in the selection and management of a caseload of hypertensive clients.

A summary of data processing follows.

#### Data Processing

The procedure for data analysis included the initial generation of measures of central tendency for each descriptive and independent variable for each of the two study groups. The first null hypothesis (sociodemographic characteristics and duration of disease) was tested using the nonparametric chi-square technique to determine whether or not a significant difference exists between known study group membership (observed frequency of cases) and nongroup members (expected frequency of cases) (Kviz and Knafl, 1980; Runyan and Haber, 1979). Next a t-test for independent samples was employed to test null hypotheses two through eight for determination if either study group had significantly different responses on the independent variables (knowledge, health perceptions, and compliance). Finally, a stepwise multiple regression analysis was performed on the descriptive variables (sociodemographic characteristics and duration of disease), the intake independent variables (knowledge and health perceptions), and the variable compliance throughout the nursing intervention. The multiple regression analysis was performed on hypotheses one, two, four, six, and eight. The independent variables measured at the six month (post-intervention) period were omitted from the regression analysis since the practical purpose of this study was to differentiate those client characteristics which may be predictive of blood pressure control prior to the implementation of nursing intervention. In summary, four analytic techniques were used to process the data: measures of central tendency, chi-square, t-tests, and a stepwise multiple regression.

A brief discussion of each selected statistical technique follows. A discussion on the measures of central tendency has been omitted since these procedures are commonly used.

## Chi-Square

The chi-square test is computed by comparing two sets of frequencies: the known and unknown study group members as predicted by the variable(s) under study. This test does not indicate the direction or strength of a relationship between the study groups and the descriptor or independent variables. Chi-square represents only the probability that a relationship exists (Kviz and Knafl, 1980). If a statistically significant ( $p \le .05$ ) relationship had been obtained for any variable in the chi-square analysis, a correlational statistic would have been computed to determine the direction and magnitude of that relationship (Borg and Gall, 1979). The greater the chi-square value, the greater the difference between the observed and expected frequencies (Borg and Gall, 1979). A brief discussion on the t-test follows.

# T-Test for Independent Samples

The t-test is the computation of a standardized score as based on the differences between the means of two sample groups to determine the probability that the observed sample differences would also hold true for the population from which the study sample was drawn (Kviz and Knafl, 1980) The final statistical technique to be discussed is a stepwise multiple regression analysis.

## Stepwise Multiple Regression

An overview of the major features of a stepwise multiple regression is presented since the computational aspects are too involved for a discussion here. The predictive descriptor and independent variables are stepped or entered into the regression equation sequentially in the order which produces the greatest explanation of the between group variance.

The stepwise process begins by choosing the single variable which has the highest  $R^2$  value. That variable is then paired with each of the other variables, one at a time, and a new  $R^2$  value computed. The new variable which explains the largest portion of the remaining variance after the first variable is taken into account is selected as the second variable to enter the analysis. These two variables are then combined with each of the remaining variables, one at a time, to form triplets for computation of an  $R^2$  value. This procedure of locating the next variable stops after no additional variables produce improved prediction of study group membership.

As variables are selected for inclusion into the stepwise analysis,

some previously selected variables may lose their discriminating power. Such variables are eliminated becuase the information they contain about group differences is now available in some other combination of variables. Dropped variables may re-enter the analysis at a later step (Polit and Hungler, 1978; and Borg and Gall, 1979).

In this study, the procedure for locating the next variable stopped after four variables were selected (education, exercise compliance, occupation, and income) since no additional variables produced improved prediction of study group membership. This section on statistical analysis concludes with a discussion on the rationale for the selection of the statistical techniques.

## Rationale for Selection of Statistical Techniques

The selected statistical techniques of chi square, t-test, and stepwise multiple regression were chosen as the simplest and most efficient methods to analyze the hypotheses. A brief discussion on the rationale for the selection of each technique follows.

# Chi Square

The chi square technique was selected to measure the frequeucy counts of the discrete descriptive variables (sociodemographic characteristics and duration of disease) for the two study groups since the variables under study met the following requirements for use. Data in hypothesis 1. are available as group means with an expected frequency for each cell greater than zero. One limitation in the use of chi square was the size of the least progress group (n = 13). Since the expected frequencies could fall between 5 and 10 for the least progress group, a Pearson Product Momment Correlation was employed for continuity to the chi square data (Kviz and Knafl, 1980).

#### **T-Test**

The t-test is the basic parametric procedure for testing differences in group means. This procedure assumes: (1) at least one dependent variable is under study; (2) at least interval scale measurements; and (3) that the varibales are normally distribued in the population. Although the t-test was selected for single hypothesis testing, the above three assumptions were not met in every hypothesis. The exceptions are in hypotheses 2. and 3., in which the perceived mean severity of hypertensive symptoms is measured on a five point Likert scale, an ordinal measurement. Likewise, hotheses 4. and 5. measure the expressed benefits and barriers to following the medication and diet regimens on a similar ordinal scale. The t-test was selected in the analysis, even though it did not strictly meet the requirements for use in four hypotheses, because it is a powerful test. Violations of the three assumptions for use of parametric tests reportedly fail to affect statistical decision making and errors according to Polit and Hungler (1978).

## Stepwise Multiple Regression

Regression analysis is a highly useful statistical technique in behavioral studies since it permits the researcher to study how a combination of several independent variables might affect the dependent variable. A regression analysis is used when the dependent variable is a dichotomous variable expressing group membership. In this study the dependent variable, the mean diastolic blood pressure, is an artificially dichotomous variable since the classification of study subjects into the two study groups was based on an arbitrary criterion, the most versus the least progress made toward blood pressure control (Borg and Gall, 1979). Multiple regression analysis is the preferred statistical

technique to address the hypotheses because it meets the requirements for use and is the most time and cost efficient method of analysis. The procedures implemented to ensure the rights of study participants is discussed in the following section.

#### Human Rights Protection

The specific procedures that were followed by the research staff to protect the rights of the study participants complied with the current standards in research using human subjects. The potential study population was identified by means of computerized data contained in the health information systems in three family practice residency training centers and by means of client lists drawn up by four private physicians in two private practices. Medical record auditors, using a standardized form and set of criteria, abstracted data from the medical records of potential study subjects at the above sites to determine if they were eligible for enrollment into the study. If eligibility was established, potential participants were sent a letter by the Medical Director of the center at which they received care. This letter described the study, explained the benefits to be derived from it, and asked the client to participate. (See Appendix B) If the client agreed to participate, s/he was asked to schedule an appointment to be interviewed. Interviewers met with the clients individually to explain the study to them and to obtain their written consent to participate. (See Appendix C) This methodology allowed the potential participant the right to refuse to participate in the study without having contact with the researcher directly so that any form of coercion was controlled.

Potential participants were informed verbally and in writing that their participation would be treated in strict confidence and that should

the results of the study be published, the participants name will remain anonymous. The study results were offered to clients upon their request. In addition, participants were aware that if they withdrew from the study after originally agreeing to participate, the amount and quality of care provided to them would not change. Clients were assured that they could withdraw from participating at any time.

The researchers and their staff provided for anonymity by precoding the questionnaires with the code numbers for each participant and by site number. The subject's name was never discussed or displayed with the data. The completed questionnaires were kept in a locked nursing research room at Michigan State University's College of Nursing.

#### Summary

In this chapter the research methodology and procedures were described and discussed. The specific topics presented were the hypotheses, operationalization of variables, study sample selection, instruments, data collection and scoring procedures, statistical analysis techniques, and human rights protection. In Chapter V the data will be presented.

#### CHAPTER V

## DATA PRESENTATION AND ANALYSIS

The data presented in this chapter describes the study sample and the variables which may be predictive in the identification of hypertensive clients making the most and least progress toward blood pressure control after an experimental nursing intervention. Data are initially presented on the analysis of single hypotheses: demographic factors; duration of disease; and selected concepts from the health belief model -- health perceptions, knowledge of the therapeutic regimen, and compliance with that regimen. Finally, multiple regression results are presented to describe the relationship among the sociodemographic factors, duration of disease, and intake measures based on the health belief model in an attempt to predict blood pressure control. A discussion of the findings follows the tests of hypotheses.

The study sample was comprised of fifty-five of the eighty-eight experimental hypertensive subjects in the Given and Given research project <u>Patient Contributions to Care</u>: <u>Link to Process and Outcome</u> (1977-1982) as described in Chapter IV. Study subjects were assigned to the most and least successful study groups according to their progress toward diastolic blood pressure control attained from the pre-intervention period (screening and first nursing visit) to the final nursing intervention session attended. The procedure for calculating blood pressure alteration is given in Appendix A. Forty-two subjects

comprised the most progress group and thirteen subjects comprised the least progress group. A description of findings for the study sample is presented and discussed on the following hypotheses.

## Hypotheses

Given the hypertensive subjects who are the most and least successful in making progress toward blood pressure control after an experimental nursing intervention:

- It is not possible to differentiate between the two groups of subjects on the basis of <u>demographic</u> <u>characteristics</u> (age, sex, race, income, education, and occupation) and duration of disease.
- 2. It is not possible to differentiate between the two groups of subjects on the basis of the actual <u>number of symptoms</u> <u>reported</u> and the <u>perceived mean severity</u> of hypertensive symptoms at intake into the study.
- 3. It is not possible to differentiate between the two groups of subjects on the basis of the actual <u>number of symptoms</u> <u>reported</u> and the <u>perceived mean severity</u> of hypertensive symptoms at the sixth month interview.
- 4. It is not possible to differentiate between the two groups of subjects on the basis of the <u>expressed benefits and</u> <u>barriers</u> to following the therapeutic medication and diet regimens at intake into the study.
- 5. It is not possible to differentiate between the two groups of subjects on the basis of the <u>expressed benefits and</u> <u>barriers</u> to following the therapeutic medication and diet regimens at the sixth month interview.

- 6. It is not possible to differentiate between the two groups of subjects on the basis of their <u>overall knowledge</u> scores at intake into the study.
- 7. It is not possible to differentiate between the two groups of subjects on the basis of their <u>overall knowledge</u> scores at the sixth month interview.
- 8. It is not possible to differentiate between the two groups of subjects on the basis of <u>self-reported compliance</u> rates for medication taking, diet, and exercise in nursing intervention sessions I, III, IV, V, VI, and VII.

A description of the study sample follows.

## Descriptive Findings of the Study Sample

The following tables contain data on the distribution of hypertensive study subjects (N = 55) according to the progress they achieved in decreasing the level of their diastolic blood pressure measurement. The two study groups are referred to as the most progress (n = 42) and least progress (n = 13) groups to indicate the amount of reduction achieved in diastolic blood pressure measurements. The distribution of study subjects according to sociodemographic factors and duration of disease follows.

# Distribution of Study Subjects According to Sociodemographic Factors

A description of study subjects according to age, sex, race, income, education, and occupation follows in Tables 3 through 6.

Age. For those subjects making the most progress (n = 42) toward diastolic blood pressure control, the age range was from 27 to 65 years, with a mean age of 49.6 years. For those subjects making the least progress (n = 13) toward diastolic blood pressure control, the age range

was from 26 to 62 years, with a mean age of 43.6 years. The age distributions per decade of life and percentages of subjects in each study group can be seen in Table 3.

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AGE OF STUDY SUBJECTS

		Study	Group		
Age in Years	Most Progress	(n=42)	Least	Progress	(n=13)
	N	%		N	%
21-30	2	4		2	16
31-40	6	13		5	39
41-50	13	30		1	8
51-60	17	41		4	32
61-65	4	10		1	8

<u>Sex</u>. The distribution and percentage of subjects in each study group are presented in Table 4 according to gender. The most progress group (n = 42) had a slightly higher percentage of males.

TABLE 4.

SEX OF SUBJECTS

		Stud	ly Group
Sex	Most Progress	(n=42)	Least Progress (n=13)
	N	%	N %
Male	22	52	5 38
Female	20	48	8 62

<u>Race</u>. The racial background of study participants can be seen in Table 5. The majority of subjects in each study group was Caucasian.

TABLE 5.

RACE OF SUBJECTS

		St	udy Group			
Race	Most Progress	(n=42)		Least	Progress	(n=13)
	N	%			N	%
Caucasian	37	88			12	92
Black	5	12			1	8
Mexican Am.	0	0			0	0
Other	0	0			1	8

<u>Family Income</u>. The mean total family income was calculated to be between \$17,000and \$19,999 for the most progress group (n = 40) and between \$17,000 and \$19,999 for the least progress group (n = 13). One respondent in the least progress group indicated an income below \$5,000. Two subjects in the most progress group did not respond to this question on the Intake "Socio-Demographic" instrument.

Education. The average level of education for the most progress group was graduation from high school and some college for the least progress group. The frequency distribution and percentage of participants in each study group according to the highest levels of attained education can be seen in Table 6.

<u>Occupation</u>. The occupation of the participants was elicited and classified in categories according to Hollingshead (1967). The average

	Study Group					
Educational Level	Most Progr	ess (n=42)	Least Progre	ss (n=13)		
	N	К	N	%		
None or Some Grammar School	3	7	0	0		
Junior High School	2	5	0	0		
Some High School	5	12	1	8		
Graduated from High School	14	33	3	23		
Technical, Business, or Trade School	1	2	0	0		
Some College	11	26	1	8		
Graduated College	5	12	2	15		
Post-Graduate College	1	2	6	46		

occupation for the most progress group (n = 25) was clerical and sales work to administrative and small business positions. The average occupation for the least progress group (n = 9) was administrative and small business positions. Seventeen participants (41%) in the most progress group and four participants (32%) in the least progress group did not respond to this question on the Intake "Socio-Demographic Instrument."

A description of study subjects according to the duration of diagnosed hypertension follows.

# Distribution of Study Subjects According to Duration of Hypertension

For those subjects making the most progress toward blood pressure control, the duration of hypertension ranged from less than 1 year to 15 or more years as it was also for the least progress group. The most progress subjects were characterized by an average duration of 6 to 8 years, while subjects making the least progress toward blood pressure control were characterized by an average duration of 3 to 5 years.

## Tests of Hypotheses

The results of the single hypothesis tests are presented in Table 7. A narrative presentation of the study results for hypotheses 1. through 8. follows.

# Hypothesis 1. Sociodemographic Factors and Duration of Disease

<u>Sociodemographic Factors</u>. The sociodemographic data (age, sex, race, income, education, and occupation) obtained on the Intake "Socio-Demographic Instrument" were analyzed by the chi square method. The highest level of attained education was statistically significant at  $p \leq .01$  for predicting progress toward blood pressure control. Those making the most progress (n = 42) toward diastolic blood pressure

control had a mean level of education as high school graduation while the mean educational level of the least progress group (n = 13) was some college. The sociodemographic factors of age, sex, race, family income, and occupation failed to achieve statistical significance of  $p \leq .05$ .

Computation of a Pearson Correlation Coefficient verified the results of the chi square analysis. However, age, in addition to education, emerged as a significant variable. Those subjects making the most progress toward blood pressure control had an average age of 49.6 years while those in the least progress group had a hounger average age of 43.6 years.

The results of the correlation analysis between the sociodemographic factors and progress toward diastolic blood pressure control are presented in the following section. The Pearson Correlation Coefficients were statistically nonsignificant for the variables of sex, race, income, and occupation.

Age. The Pearson Correlation Coefficient of -0.25 was statistically significant at p = .03. Subjects in the least progress group are, as an average, six years younger than those subjects in the most progress group.

Education. The Pearson Correlation Coefficient of 0.39 was statistically significant at p = .001.

In summary, two sociodemographic variables, age and education, are significantly ( $p \leq .05$ ) associated with progress toward diastolic blood pressure control. Pearson Correlation Coefficients revealed that age and education are statistically significantly associated with progress toward blood pressure control at p = .03 and p = .001 respectively. Age and education are inversely related to diastolic blood pressure levels. Twenty-one participants failed to report occupation. Two participants in the most progress group did not report family income.

<u>Duration of Disease</u>. The data on the known duration of hypertension, as obtained on the Intake "Socio-Demographic" Instrument, was analyzed by the chi square method. No significant association ( $p \le .05$ ) was found between disease duration and progress toward blood pressure control.

# Hypothesis 2. Number and Severity of Hypertensive Symptoms at Intake

<u>Number of Hypertensive Symptoms at Intake</u>. Participants in each study group reported a statistically nonsignificant (p = .05) average number of hypertensive symptoms on the "Hypertension Severity Scale" at intake. The most progress group reported a mean of 2.65 hypertensive symptoms with a standard deviation of 0.58. The least progress group reported a mean of 2.55 symptoms with a standard deviation of 0.37. These hypertensive symptoms were tested for statistical significance by a t-test. The test results can be seen in Table 7. as statistically nonsignificant at p = .54.

<u>Severity of Hypertensive Symptoms at Intake</u>. Study participants rated their perceived severity of each hypertensive symptom in a Likert scale on the "Hypertension Severity Scale" at intake. A score of one indicates a "not severe symptom" and a score of five indicated a "severe symptom." Study participants reported a group mean symptom severity score of "not severe." The most progress group's mean symptom severity score was 0.65 with a standard deviation of 0.71. The least progress group's mean symptom severity was 0.66 with a standard deviation of 0.70.

Н <sub>о</sub>	Variables	Test	Value	df	Significance Level	р
1	Age	χ2	33.76	29	•25	n.s.
1	Sex	••	0.77	1	• 38	n.s.
1	Race		4.80	2	•09	n.s.
1	Income	••	8.14	8	.42	n.s.
1	Education	**	18.95	7	.01	×
1	Occupation	••	7.00	6	.26	n.s.
1	Duration of Disease	**	2.74	6	.84	n.s.
2	Symptoms @ Intake	t-test	0.62	53	• 54	n.s.
2	Symptom Severity @ Intake		-0.01	53	•99	n.s.
3	Symptoms @ 6 Months	"	-0.11	52	•91	n.s.
3	Symptom Severity @ 6 Months	"	-0.21	52	.83	n.s.
4	Medication Beliefs @ Intake	"	-0.35	53	•73	n.s.
4	Diet Beliefs @ Intake	**	-0.36	52	.72	n.s.
5	Medication Beliefs @ 6 Months		-1.90	52	•06	n.s.
5	Diet Beliefs @ 6 Months		-1.46	52	•15	n.s.
6	Knowledge @ Intake		-0.65	53	•41	n.s.
			_			

# TABLE 7.TESTS OF SINGLE HYPOTHESESFOR STUDY SUBJECTS (N = 55)(USING CHI-SQUARE OR T-TESTS)

TABLE 7. (CONT'D)

н <sub>о</sub>	Variables	Test	Value	df	Significance Level	р
7	Knowledge @ 6 Months	t-test	-1.32	52	•19	n.s.
8	Medication Compliance	"	1.26	52	.21	n.s.
8	Diet Compliance	"	1.57	52	.12	n.s.
8	Exercise Compliance	"	2.40	52	.02	*

\*p ≤ .05

These symptom severity means were tested for statistical significance by a t-test.

In summary, neither the number of hypertensive symptoms nor the perceived mean severity of those hypertensive symptoms at intake is significantly associated with progress toward blood pressure control. <u>Hypothesis 3. Number and Severity of Hypertensive Symptoms at Six Months</u>

<u>Number of Hypertensive Symptoms at Six Months</u>. Participants each study group reported a statistically nonsignificant (p > .05)average number of hypertensive symptoms on the "Hypertension Severity Scale" at the six month interview. The most progress group reported a mean of 2.71 hypertensive symptoms with a standard deviation of 0.47. The least progress group (n = 12) reported a mean of 2.72 symptoms with a standard deviation of 0.28. These mean hypertensive symptoms were tested for statistical significance by a t-test. Severity of Hypertensive Symptoms at Six Months. Participants in each study group rated their perceived severity of each hypertensive symptom in a Likert scale on the "Hypertension Severity Scale" at six months. A score of (1) indicated a not severe symptom and a score of (5) indicated a severe symptom. Study participants reported a group mean severity score indicating "not severe" symptoms. The most progress group's mean symptom severity was 0.52 with a standard deviation of 0.64. The least progress group's (n = 12) mean symptom severity was 0.56 with a standard deviation of 0.53. These symptom severity means were tested for statistical significance by a t-test.

In summary, neither the number of hypertensive symptoms nor the perceived mean severity of those hypertensive symptoms at six months is significantly associated with progress toward blood pressure control. One study participant in the least progress group did not complete the "Hypertension Severity Scale" at six months.

# <u>Hypothesis</u> <u>4</u>. <u>Expressed Benefits</u> and <u>Barriers</u> to <u>Medication</u> and <u>Diet</u> <u>Regimens at Intake</u>

<u>Benefits and Barriers to Medication at Intake</u>. Participants in each study group responded to twelve medication belief statements concerning the components of their individual regimens on the "Beliefs About Hypertension" instrument at intake. Each item was scored from one to five points with a score of five indicating the most clinically desirable response. Both study groups responded with clinically desirable beliefs. The most progress group reported a mean belief score of 4.20 with a standard deviation of 0.50. The least progress group reported a mean belief score of 4.26 with a standard deviation of 0.54. These medication belief means were tested for statistical significance by a t-test. The test results can be seen in Table 7. as statistically nonsignificant at p = .73.

<u>Benefits and Barriers to Diet at Intake</u>. Participants in each study group responded to twelve statements concerning the components of their individual regimen on the "Beliefs About Hypertension" instrument at intake. Each item was scored from one to five points with a score of five indicating the most clinically desirable response. Both study groups responded with moderately clinically desirable dietary beliefs. The most progress group (n = 41) reported a mean belief score of 3.56 with a standard deviation of 0.64. The least progress group reported a mean belief score of 3.63 and a standard deviation of 0.64. These diet belief mean scores were tested for statistical significance by a t-test. The test results can be seen in Table 7. as statistically nonsignificant at p = .72.

In summary, the expressed benefits and barriers to medication and diet regimens at intake are not significantly associated with progress toward blood pressure control. The expressed beliefs about medication were somewhat more desirable than the beliefs about diet. One study participant in the most progress group did not complete the diet belief scale at intake.

# <u>Hypothesis 5</u>. <u>Expressed Benefits and Barriers to Medication and Diet</u> <u>Regimens at Six Months</u>

<u>Benefits and Barriers to Medication at Six Months</u>. Participants in each study group responded to twelve medication belief statements concerning the components of their individual regimens on the "Beliefs About Hypertension" instrument at six months. Each item was scored from one to five points with a score of five indicating the most clinically

desirable response. Both study groups responded with clinically desirable medication beliefs. The most progress group reported a mean belief score of 4.45 with a standard deviation of 0.56. The least progress group (n = 12) reported a mean belief score of 4.71 with a standard deviation of 0.34. These medication belief means were tested for statistical significance by a t-test.

<u>Benefits and Barriers to Diet at Six Months</u>. Participants in each study group responded to twelve statements concerning the components of their individual regimen on the "Beliefs About Hypertension" Instrument at six months. Each item was scored from one to five points with a score of five indicating the most clinically desirable response. Both study groups responded with moderately clinically desirable diet beliefs. The most progress group reported a mean belief score of 3.69 with a standard deviation of 0.56. The least progress group (n = 12) reported a mean belief score of 3.96 with a standard deviation of 0.60. These diet belief scores were tested for statistical significance by a t-test. The test results can be seen in Table 7. as statistically nonsignificant at p = .15.

In summary, the expressed benefits and barriers to medication and diet regimens at six months are not significantly associated with progress toward blood pressure control. Expressed beliefs about medication are somewhat more desirable than beliefs about diet. One study participant in the least progress group did not complete the medication and diet belief scales at six months.
# <u>Hypothesis</u> <u>6</u>. <u>Knowledge</u> <u>of</u> <u>Disease</u> <u>and</u> <u>of</u> <u>the</u> <u>Therapeutic</u> <u>Regimen</u> <u>at</u> <u>Intake</u>

Participants in each study group responded to a forty item multiple-choice test "Understanding High Blood Pressure" to assess their understanding of hypertension and their therapeutic regimen. The test score represents the number of correct responses out of a possible total of forty test items. Participants in both study groups correctly responded to approximately one half of the knowledge questions. The average number of correct test items for the most progress group was 20.64 with a standard deviation of 3.68. The average number of correct test items for the least progress group was 21.38 with a standard deviation of 3.25. These mean knowledge scores were tested for statistical significance by a t-test.

In summary, the participants' knowledge of hypertension and of the therapeutic regimen at the intake into the study is not significantly associated with progress toward blood pressure control.

# <u>Hypothesis 7</u>. <u>Knowledge of Disease and of the Therapeutic Regimen</u> <u>at Six Months</u>

Participants in each study group responded to a forty item multiple-choice test "Understanding High Blood Pressure" to assess their understanding of hypertension and their therapeutic regimen. The test score represents the number of correct responses out of a possible total of forty test items. Participants in both study groups correctly responded to approximately one half of the knowledge questions. The average number of correct test items for the most progress group was 21.95 with a standard deviation of 3.14. The average number of correct test items for the least progress group (n = 12) was 23.25 with a standard deviation of 2.42. These knowledge scores were tested for

statistical significance by a t-test.

In summary, the participants' knowledge of hypertension and of the therapeutic regimen at six months is not significantly associated with progress toward blood pressure control. One study participant in the least progress group did not complete "Understanding High Blood Pressure" at six months.

Hypothesis 8. Compliance with Medication, Diet, and Exercise Regimens

The self-reported compliance rates in medication, diet, and exercise regimens were elicited on all study subjects during the course of the eight session experimental nursing intervention. Compliance data are presented in the following section. One study participant's nursing record contained no compliance data.

<u>Medication Compliance</u>. A mean medication compliance score was computed for sixteen medication compliance assessments and scaled from "all the time" (5), "more than half the time" (4), "one half the time" (3), "less than half the time" (2), to "none of the time" (1). Participants in both study groups reported taking medication "more than one half the time." The average medication compliance score for the most progress group (n = 41) was 4.90 with a standard deviation of 0.12. The average medication compliance score for the least progress group was 4.83 with a standard deviation of 0.25. These mean medication compliance scores were tested for statistical significance by a t-test.

<u>Diet Compliance</u>. A mean diet compliance score was computed for five diet assessment items and scaled from "all the time" (5) to "none of the time" (1). Participants in both study groups reported following the prescribed diet regimen more than half the time. The mean diet compliance score for the most progress group (n = 41) was 4.08 with

a standard deviation of 0.68. The mean diet compliance score for the least progress group was 3.70 with a standard deviation of 0.99. The diet compliance scores were tested for statistical significance by a t-test.

Exercise Compliance. A mean exercise compliance score was computed for two exercise assessments and scaled from "all the time" (5) to "none of the time" (1). A statistically significant (p = .02) association was found between exercise compliance and progress toward blood pressure control by t-test as can be seen in Table 7. The most progress group (n = 41) reported an average exercise compliance score of 3.88 with a standard deviation of 1.19. The least progress group reported an average exercise compliance score of 2.96 with a standard deviation of 1.28.

In summary, among medication, diet, and exercise compliance, only exercise compliance was significantly associated with blood pressure control.

#### Summary of the Single Hypothesis Tests

Tests of the single hypotheses revealed a statistically significant association between the sociodemographic variable of age (p = .03), education ( $p \le .01$ ), and exercise compliance (p = .02) with progress toward diastolic blood pressure control. No significant association was evident between the other sociodemographic factors of sex, race, family income, and occupation; the duration of hypertension; the perceived number and severity of hypertensive symptoms at intake and at six months; commitment to medication and diet regimens at intake and six months; knowledge of disease and of the therapeutic regimen at intake and six months; and self-reported compliance to the medication and diet regimens during the experimental nursing intervention. The results of the multiple variable analysis follows.

# Stepwise Multiple Regression Analysis

A multiple regression analysis is one multivariate correlational method used to understand the strength of relationships between two or more independent variables upon a single dependent measure. The mathematical objective is to weight and linearly combine the variables in some fashion to discriminate between the two study groups. This regression procedure determines whether two or more of the independent variables can be combined to predict blood pressure control better than any one statistically significant independent variable (Borg and Gall, 1979; Polit and Hungler, 1978).

A stepwise multiple regression analysis was performed on the descriptive variables in Hypothesis 1. (sociodemographic factors and duration of disease) and intake independent variables in Hypotheses 2., 4., 6., and 8. (knowledge, health perceptions, and compliance) to determine the relationship among multiple intake variables and progress toward diastolic blood pressure control.

A six step regression analysis was performed to identify the set of predictor variables which accounted for the maximal intergroup variance for study subjects (n = 33) responding to every study variable. Four significant variables: education, exercise compliance, occupation, and family income made up the best set of factors which together seem to predict progress toward diastolic blood pressure control at  $p \leq .05$ . The multiple regression values can be seen in Table 8.

In order to accurately interpret the findings of the multiple regression analysis, the responses of the twenty-four subjects in the most progress group and the nine least progress subjects were generated for

Steps	Variables	Multiple R Value	df	R <sup>2</sup>	Significance Level
1	Education	0.40	32	0.16	•000 **
2	Exercise Compliance	0.50	32	0.25	•006 <b>*</b>
3	Occupation	0.60	32	0.36	•00 <b>1 **</b>
4	Family Income	0.67	32	0.45	•027 <b>*</b>
5	Sex	0.71	32	0.50	.066
6	Duration of Disease	0.75	32	0.57	•070

TABLE 8. VARIABLE ENTRY IN STEPWISE MULTIPLE REGRESSION ANALYSIS FOR SUBJECTS (n = 33) RESPONDING TO ALL STUDY QUESTIONS IN MOST AND LEAST PROGRESS STUDY GROUPS

\* p ≤ .05 \*\* p ≤ .001

the six variables that emerged during the regression analysis. The findings of the regression analysis on thirty-three subjects could not accurately be interpreted according to the data generated in the single tests of hypotheses for a study sample ranging from thirty-four to fifty-five subjects.

In summary, the following interpretation of the multiple regression analysis is based upon the responses of a subset of study subjects (n = 33) who responded to all questionnaire and interview items. In particular, these thirty-three subjects were the only participants who responded to all education, occupation, and exercise compliance items.

Progress toward blood pressure control is positively associated with exercising more than half the time. The inability to make progress toward blood pressure control is negatively associated with education,

Variables	Most Grou	Progress p (n = 24)	Least Group	Least Progress Group (n = 9)		
	N	К	N	%		
Education						
None or Some Grammar School	1	4	0	0		
Junior High School	1	4	0	0		
Some High School	1	4	1	11		
Graduated High School	9	37	1	11		
Technical, Business, or Trade School	0	0	0	0		
Some College	7	29	0	0		
Graduated College	5	21	2	22		
Post-Graduate College	0	0	5	55		
Occupation						
Higher Executive	2	8	3	33		
Business Mgr., Lesser Professional	5	21	2	22		
Administrative Personnel, Small Independent Business	5	21	1	11		
Clerical and Sales Worker	5	21	1	11		
Skilled Manual Employees	3	12	0	0		
Machine Operators and Semi Skilled Employees	4	17	1	11		
Unskilled Employees	0	0	1	11		

# TABLE 9. DISTRIBUTION OF RESPONSES FOR STUDY SUBJECTS (n = 33) RESPONDING TO ALL STUDY QUESTIONS IN MOST AND LEAST PROGRESS STUDY GROUPS

TABLE 9. (CONT'D)

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Variables	Most Grou	Progress p (n = 24)	Leas <sup>.</sup> Grouj	Least Progress Group (n = 9)		
	N	%	N	К		
Family Income	<u></u>					
Below \$5,000	1	4	0	0		
\$5,000-\$10,999	0	0	0	0		
\$11,000-\$16,999	2	8	1	11		
\$17,000-\$24,999	7	29	3	33		
Over \$25,000	14	58	5	55		
Sex						
Male	15	62	5	55		
Female	9	37	4	44		
Duration of Disease						
Less than 1 year	3	12	0	0		
1 to 2 years	5	21	2	22		
3 to 5 years	5	21	1	11		
6 to 8 years	2	8	3	33		
9 to 11 years	5	21	4	44		
12 to 14 years	0	0	2	22		
15 years or more	4	17	2	22		

employment, and family income. A frequency distribution of responses for each of the six variables (education, exercise compliance, sex, occupation, family income, and duration of disease) selected in the stepwise multiple regression analysis can be seen in Table 9. The average education for respondents in the most progress group (n = 24) was high school graduation. Some college was the average among least progress group members (n = 9). The average occupation for study subjects in the most progress group was administrative personnel, small independent business, and clerical or sales work. Least progress group members reported an average occupation of administrative personnel and small business operators. The total family income averaged \$20,000 to \$24,999 for the most progress respondents and \$20,000 to \$24,000 for the least progress respondents. Male sex was reported among more than one half of the subjects in both study groups (n = 33). The average duration of hypertension ranged from six to eight years for subjects in both study groups.

#### Discussion

The study findings will be interpreted by comparing and contrasting the study variables to prior research findings and to the conceptual framework in Chapter II. The descriptive findings (sociodemographic characteristics and duration of disease) will be discussed first and followed by an interpretation of the independent variables (health perceptions, knowledge of disease and the therapeutic regimen, and self-reported compliance with the therapeutic regimen). A discussion of the findings from the multiple regression analysis for multiple hypotheses concludes this section.

Hypothesis 1. Sociodemographic Characteristics and Duration of Disease

The sociodemographic factors of age, sex, race, family income, education, and occupation are discussed initially and followed by an interpretation of the duration of disease for study participants in each of the two study groups.

Age. Subjects in the most progress and least progress groups had average ages of 49.6 years and 43.6 years respectively. This finding was statistically nonsignificant (p > .05) in a chi square analysis and statistically significant (p = .03) in a Pearson Correlation. This discrepancy in significance may be explained as either a type II decision error in the chi square analysis or a type I decision error in the correlation analysis. The maximum probability of a type II error in the chi square analysis was seventy-five percent (1 minus the standardized score of 0.25) while a five percent probability existed for a type I error in the correlation analysis at the .05 significance level. A type II error, accepting a false null hypothesis, appears to be the most likely explanation for the nonsignificant chi square test finding. In other words, age may have been a significant factor in diastolic blood pressure control, with older aged study subjects (age 49 years) being more likely to have a controlled blood pressure than subjects of younger age (43 years).

According to the related literature, both study groups were comprised of hypertensives who were less likely to have experienced blood pressure control. Studies by Fletcher, Deliakis, Schoch, and Shapiro (1979); Stamler et al. (1980); Wagner, Truesdale, and Warner (1980); and Freeman et al. (1983) suggest that older aged hypertensives (from 50 to 68 years) are more likely to have a controlled diastolic blood pressure than clients under age fifty years.

Study subjects in this project were younger than other samples in the published research. Therefore, it is not possible to compare the age findings with any other sample of similar age and economic background.

Age is a nonmodifiable characteristic which the hypertensive client brings into the client and provider interaction. According to King (1981), increasing age is defined as the passage of time in which life experiences accumulate and provide for man to attain optimum self-actualization through the attainment of developmental potentials. This conceptual perspective is consistent with the findings of this study in which increasing age is significantly associated with the client's progress toward attaining blood pressure control.

<u>Sex</u>. Subjects in the most progress and least progress groups had variations in the ratio of males to females (52% : 48% and 38% : 62% respectively). Gender was nonsignificantly associated with blood pressure control. A nonsignificant trend existed among females in the least progress group to be more likely than males to make the least progress in reducing diastolic blood pressure elevations.

The related literature contains contradictory reports on the relationship between sex and blood pressure control. Wagner, Truesdale, and Warner (1981); Brown, Brown, and Stephens (1982); Freeman et al. (1983); and DeVon and Powers (1984) report that female hypertensives are more likely than male hypertensives to have a controlled blood pressure (< 90 mm Hg.) among study samples, who are in part, older, females, with varying socioeconomic status (poor Elack, Harlem residents to Caucasian middle to upper class Chicago suburbanites). Fletcher,

Deliakis, Schoch, and Shapiro (1979) and Buck and Donner (1984) report that sex is not related to blood pressure control among samples of predominantly elderly females whose other demographic characteristics are not given in the published reports. The possibility of an age and sex interaction is questioned among the younger females in the least progress group. This age and sex interaction remains to be empirically validated.

The nonsignificant relationship between sex and blood pressure control could be explained by King's (1981) concept of role-taking. This study's participants either did not have different values and sanctions concerning sick role behaviors or had already overcome the gender related conflicts that may occur in the process of taking on a sick role.

<u>Race</u>. Subjects in the most progress and least progress groups were predominantly Caucasian with a respective twelve percent and eight percent Black population. This percentage of Blacks is not representative of the overall composition of the United States' hypertensive population which includes a twenty percent to forty percent Black subgroup (Stamler et al. 1974; Kaplan, 1978). The proportion of Blacks to Caucasians in the Givens' project was representative of the racial mixture in those cities where data was collected. In this study, race was not significantly associated with progress toward blood pressure control.

The related literature also reports that race is not associated with blood pressure control, particularly among caucasian hypertensives (Fletcher, Deliakis, Schoch, and Shapiro, 1979; Dove and Schneider, 1980; Wagner, Truesdale, and Warner, 1981). This study's findings are consistent with the literature review.

Race, like age and sex, are determinants of an individual's

knowledge base, needs, goals, expectations, perceptions, and past experiences which influence the client and provider relationship (King, 1981). It can be inferred that race was not a significant determinant in the outcome of the Given nursing intervention for this study's subjects.

<u>Family Income</u>. Subjects in the most progress and least progress groups reported mean family incomes between \$17,000 and \$19,999, reflective of middle class status. It is interesting to note that seventyseven percent (n = 10) of the least progress group had incomes over \$17,000. This nonsignificant trend of incomes over \$17,000 being associated with a greater likelihood of achieving minimal progress in blood pressure control remains to be empirically validated in other studies.

The nonsignificant relationship between total family income and blood pressure control cannot be compared to other research findings, since no study could be retrieved which focused on the association between these two variables.

The Given nursing intervention, with its emphasis on client determination rather than on professional dominance, encouraged study participants to respond openly on the basis of personal priorities rather than to provider recommendations. Perhaps clients with middle incomes, and above, may have placed their health behaviors into the larger complex of competing personal needs and interests, resulting in a lesser performance on their own behalf with regard to health behaviors. The modifying factors of regimen complexity, longevity of the regimen, and disruption of the regimen to customary activities may be crucial factors in understanding the responses of middle to upper income study participants. The omission of these modifying factors from this study makes it impossible to identify some of the life style factors which may have

been a determinant of the health behaviors for least successful subjects.

Education. Those subjects making the most progress toward diastolic blood pressure control had a man level of education of high school graduation. This was significantly different than the mean of some college among subjects in the least progress group.

The research literature does not support the inverse relationship between educational achievement and diastolic blood pressure level. Buck and Donner (1984) and DeVon and Powers (1984) report that education is not significantly associated with blood pressure control. However, neither study operationalized blood pressure control in a method consistent with the design of this study. Buck and Donner studied the loss of blood pressure control ( $\geq$  90 mm Hg.) among previously controlled (< 90 mm Hg.) hypertensives. DeVon and Powers studied blood pressure control as defined by provider judgment and not based on objective criteria. Perhaps subjects with higher levels of education, perceive other life style demands as higher priorities, or may have additional barriers to overcome in order to comply with prescribed therapy and attain blood pressure control.

Occupation. It is not possible to interpret the relationship between occupation and progress toward blood pressure control since seventeen subjects (41%) in the most progress group and four subjects (32%) in the least progress group did not respond to this question. Of the thirty-four subjects who did respond, seven subjects (18%) of the most progress group and five subjects (55%) of the least progress group were employed in higher occupational categories of management personnel, lesser professionals, and executives. These occupational responses are consistent with this study's findings concerning income and education.

Those subjects of higher economic status had more difficulty controlling their diastolic blood pressure than did those subjects with lesser income, education, and occupations.

This study's findings of a nonsignificant relationship between occupation and blood pressure control is consistent with the one published study by DeVon and Powers (1984) which reports that occupation is not associated with blood pressure control among middle to upper class hypertensives. One additional study by Dove and Schneider (1984) did contain an attempt at controlling for stress: history of alcohol abuse and history of psychiatric problems. Dove and Schneider report that neither alcohol abuse nor a history of psychiatric problems is related to blood pressure control. DeVon and Powers (1984) report that the vocational environment is not significantly associated to the psychosocial adjustment to illness for controlled and uncontrolled subjects.

It appears that those clients traditionally assumed to possess the resources and incentives to pursue positive health behaviors are unable, for some unknown reason, to control their hypertension. Perhaps the health belief model's modifying factors (regimen complexity, longevity of regimen, and disruption of the regimen to customary activities) need to be expanded to include the, as yet unknown, factors that may produce stress for the middle and upper income hypertensives.

<u>Duration of Hypertension</u>. The average duration of hypertension for the most progress group was six to eight years, while the least progress group had an average duration of three to five years. This nonsignificant finding is consistent with prior research (Norbrega, Morrow, Smoldt, and Offord, 1977; Dove and Schneider, 1980; DeVon and Powers, 1984) findings in which a nonsignificant association between the duration of

disease and blood pressure control is reported. This study's trend for subjects in the most progress group to have had a slightly longer duration of disease is contradictory to the DeVon and Powers report in which the controlled hypertensives had a slightly shorter duration of disease. Hershey, Morton, Davis, and Reichgott (1980) also report that a duration of hypertension of less than five years is indirectly related to blood pressure control.

The conceptual framework contains an explanation of these contradictory reports on the relationship between the duration of disease and blood pressure control. Perhaps clients with longer durations of disease are experiencing more life style modifications and transient barriers to carrying out the therapeutic regimen with a subsequent elevation in blood pressure as in the DeVon and Powers (1984) and Hershey, Morton, Davis, and Reichgott (1980) study samples. However, it seems more plausible that clients with a known disease duration of longer periods of time are more likely to have had more experiences in life style modification and developed successful problem-solving behaviors, which are necessary for long term hypertension control, as suggested in this study.

In summary, the descriptive findings of this study indicate that among predominantly Caucasian hypertensives, equally represented in gender, those subjects of younger age, with higher income, more advanced education, and employment in the higher occupations tend to have more difficulty in achieving blood pressure control than subjects of older age, lower socioeconomic backgrounds, and with a slightly longer duration of disease.

# <u>Hypotheses</u> 2., 3., 4., and 5. <u>Health</u> <u>Perceptions</u> at <u>Intake</u> and <u>Six</u> <u>Months</u>

The following section contains a discussion on the health perceptions of symptomatology at intake (Hypothesis 2.), and at six months (Hypothesis 3.), and the benefits and barriers to the medication and diet regimens at intake (Hypothesis 4.), and at six months (Hypothesis 5.). The combined concepts of benefits and barriers are also referred to as commitments, as operationalized in Chapter IV.

Actual Number and Mean Severity of Symptoms. Study participants in both study groups reported symptomatic hypertensive states, a finding consistent with the van Reek et al. (1982) research. No previous research is available for comparison with this study's finding of "not severe" symptoms. A slight trend for an increased perception of symptoms and a decrease in symptom severity over the six months is present for both study groups. This finding could be explained by the van Reek et al. interpretation that an awareness of the diagnosis of hypertension may be in itself associated with an increased awareness of symptomatology. The subject's awareness of hypertension may have been enhanced by the Given nursing intervention, which provided verbal and written information on the natural course of the disease and the signs and symptoms of complications. Perhaps knowledge about symptoms enhances the client's perception of actual symptoms. The Given intervention also focuses on dealing with the client's most bothersome problems. Perhaps this comprehensive attention given to the subject's entire well-being contributed to a perception that symptoms of hypertension were becoming less severe over time.

This finding is consistent with the health belief model which

proposes that the presence of symptoms is a cue to stimulate the client to seek out health care (Kirscht, 1974; Mikhail, 1981). Since study participants were symptomatic at intake into the Given study, it is not surprising that they were also currently under medical treatment.

Benefits and Barriers (Commitment) to Medication and Diet Regimens. Participants in both study groups expressed clinically desirable health perceptions about medication and diet regimens at intake and at the sixth month interview. A slight trend toward more desirable attitudes concerning medications was expressed by both groups over time. The two study groups differed in two trends of responses. First, the least progress group consistently reported slightly more desirable beliefs than did the most progress group. Second, the least progress group made slightly greater gains in modifying their beliefs than did the most progress group over the course of the nursing intervention. These group differences could be influenced by four factors. First, the therapeutic diet regimen was not introduced into the nursing intervention until nursing session three, giving the subject less opportunity to reshape dietary beliefs as compared to medication attitudes which were discussed from the first nursing session. Second, the participants in the least progress group may have developed increasing motivation to alter their beliefs over the duration of the intervention since they were made aware of their inability to achieve their individual blood pressure goal at each nursing intervention session. Third, physician providers may have emphasized the importance of the medication regimen over the benefits to be derived from the diet regimen. And lastly, the benefits and barriers to medication and diet regimens may be unrelated to the clinical outcome of progress toward blood pressure control. The Given nursing

intervention does appear to be especially effective in modifying the health perceptions of subjects having greater difficulty achieving diastolic blood pressure control.

There are no known research reports with which to compare the above findings concerning medication and diet beliefs among hypertensives given the paucity of published reports and the lack of clarity among the reports reviewed in the literature review by Johnson (1979) and Schulman (1979).

In summary, the health perceptions in this sutdy (number and severity of hypertensive symtpoms; benefits and barriers to medication and diet regimens) may have failed to be statistically significant due to two reasons: the quantification procedures and a failure to include other pertinent concepts as contained in the conceptual framework. By quantifying data according to the group mean for each study group, important intragroup variations may have been obscured. In addition, it may not be possible to ascertain the health perceptions of two groups of hypertensive subjects with varying durations of disease and therapy. This study methodology may have been improved if some control had been instituted for the comparison of health perceptions among clients with similar durations of disease and therapy. If such a control had been implemented, it may have been possible to identify those perceptions salient to a homogenous subgroup of hypertensives.

The study design may have failed to adequately measure the construct of perceived severity of disease and other modifying factors, both of which may directly affect the subject's perceived benefits and barriers to therapy. The actual number and perceived mean severity of hypertensive symptoms may not have adequately measured the broader

concept of perceived severity of hypertension.

# <u>Hypotheses</u> 6. and 7. <u>Knowledge of Disease and of the Therapeutic</u> <u>Regimen at Intake and Six Months</u>

Subjects in the most and least progress groups correctly answered one half of the forty multiple-choice items concerning their understanding of hypertension and the therapeutic regimen at the intake and sixth month testings. Participants correctly responded to an average of one additional question at the sixth month test. Knowledge scores were very slightly higher for participants in the least progress group by a mean of 0.74 points at intake and 1.30 points at six months.

This study's findings concerning knowledge and blood pressure control is consistent with published reports by Webb (1980), Tanner and Noury (1981), and Powers and Wooldridge (1982) who purport that knowledge is a poor predictor of blood pressure control in clientele who are already seeking medical care, are fairly knowledgeable about their hypertension, and who have desirable clinical beliefs about their regimens.

These findings are also consistent with the conceptual framework which contains evidence that clients with moderate knowledge levels are probably compliant with therapeutic regimens. The slightly higher knowledge scores among study subjects in the least progress group was unexpected. Perhaps knowledge, as based on the recall of facts is not directly related to blood pressure control, but to some intermediate concept or process yet to be determined. It may also be possible for clients to possess factual knowledge without making the expected behavior changes.

# Hypothesis 8. Compliance with the Therapeutic Regimen

Self-reported compliance rates to medication(s) and diet are not significantly associated with blood pressure control in this study. Exercise compliance is significantly associated with blood pressure control. Those subjects making the most progress toward blood pressure control reported exercising more than one half the time while those making the least progress reported exercising less than one half the time. A distrubtion of compliance responses for the entire study population can be seen in Table 10.

TABLE 10.SELF-REPORTED COMPLIANCE DISTRIBUTIONFOR STUDY POPULATION (N = 55) BYNUMBER AND PERCENTAGE OF SUBJECTS

			Cc	omplia	nce R	ate	-				
Treatment Regimen	All Time		$>\frac{1}{2}$ Time		$\frac{1}{2}$	1/2 Time		$<\frac{1}{2}$ Time		None	
	N	%	N	%	N	%	N	%	N	%	
Medication(s)	24	44	31	65	0	0	0	0	0	0	
Diet	5	9	41	79	4	7	4	8	0	0	
Exercise	16	<b>3</b> 0	19	35	4	7	12	22	3	6	

Study participants in the most and least progress groups are either more compliant with medication(s) than expected or are only willing to disclose noncompliance in their diet and exercise regimens. Clients may be more reticent about disclosing medication noncompliance due to the heavy emphasis placed on pharmacologic treatment of hypertension by medical providers. Compliance rates of less than one half the time were reported by fifteen percent of this study's subjects in their diet regimens and by twenty-eight percent of the subjects in their exercise programs. This downward trend of self-reported compliance is comparable to results of a three year longitudinal study of hypertensives (N = 432) in Michigan as reported by Glanz, Kirscht, and Rosenstock (1981). Forty-two percent of the Michigan subjects were compliant with their medication regimens all the time while only twenty-six percent of these subjects reported complying all the time to a socium restricted diet.

No other hypertension related research is known with which to compare this study's findings concerning exercise compliance. The significant association between exercise compliance and blood pressure control is consistent with the conceptual framework which places compliance as an intermediate outcome. In addition, study subjects who exercised more than half the time also reported complying with medication and diet regimen which is reflective of a healthful life style.

In summary, neither medication nor diet compliance is significantly associated with blood pressure control. Exercise compliance of more than one half the time is significantly associated with diastolic blood pressure control ( $\leq 90$  mm Hg.). A discussion of the findings from the multiple regression analysis for multiple hypotheses follows.

#### Findings from Multiple Regression Analysis

The multiple regression analysis of multiple hypotheses (1., 2., 4., 6., and 8. respectively representing sociodemographic factors and duration of disease; number and severity of hypertensive symptoms; benefits and barriers to medication(s) and diet regimen; knowledge of disease and therapy; and compliance with the therapeutic regimen) was performed to gain a better understanding of the complex set of intake factors which may influence progress toward diastolic blood pressure control. The stepwise multiple regression analysis was limited to subject responses at intake since the practical aim of this study was to define the characteristics of those subjects most and least likely to make progress toward blood pressure control prior to implementing nursing intervention.

Four statistically significant characteristics of clients (n = 33) making the most and least progress toward blood pressure control were generated in the multiple regression analysis: education ( $p \le .000$ ); exercise compliance ( $p \le .006$ ); occupation ( $p \le .001$ ); and family income ( $p \le .027$ ). (See Table 8.) Two trends emerged for the client's sex and duration of disease to be nonsignificantly related to blood pressure control in the regression analysis.

In order to interpret the characteristics of the subset of study subjects for whom all education, occupation, and exercise compliance data was available, a frequency distribution was generated. (See Table 9.) The remainder of this discussion compares the contrasts the study findings for the entire study sample (N = 55) and for the subset of subjects (n = 33) in the multiple regression analysis.

Education. The average highest education achievement for the subset of subjects in the most and least progress groups in the multiple regression analysis did not differ from the characteristics of the study sample in Table 6. The average level of education for the most progress groups was graduation from high school, while it was some college for the least progress groups.

Exercise Compliance. Exercise compliance for the subset subjects in the most and least progress groups in the multiple regression analysis did differ significantly from the characteristics of the study sample. The most progress group in single hypothesis tests (n = 41) reported exercising more than half the time while the least progress group reported exercising half the time. In the multiple regression analysis, both study groups reported exercising more than half the time, with the most progress group exercising slightly more than the least progress group subjects.

Although exercise compliance was statistically significant in the multiple regression analysis, it is also a variable of practical significance. Those subjects who were compliant with prescribed exercise were also highly compliant with medication taking, diet, and follow-up appointments which reflects a healthful life style.

<u>Occupation</u>. The average occupational category for subjects in the multiple regression analysis did not differ from the average occupational category of the study groups in the single test of hypothesis. The most progress subjects in both analyses reported an average occupation of clerical and sales work to administrative and small business positions. It is interesting to note that sixty-six percent (n = 6) of the least progress group subjects in the multiple regression analysis reported administrative, business, or higher executive positions whereas fifty percent (n = 12) of the most progress group reported employment in these higher occupations. Occupation is negatively associated with blood pressure control, perhaps due to job related stress or life styles.

<u>Family Income</u>. The average total family income for subjects in the single hypothesis test was lower than for the subset of subjects in the multiple regression analysis. The average family income for both the most and least progress groups was \$17,000 to \$19,999 in the single hypothesis test. The subset of subjects in the multiple regression

analysis reported average family incomes of \$20,000 to \$24,999 for both study groups. The frequency distribution contains a very similar array of incomes for both study groups in the multiple regression analysis in Table 9.

Although family income was statistically significant in the multiple regression analysis, it is a variable of limited practical significance since there is little difference in the pattern of responses for subjects in the most and least progress groups.

<u>Sex</u>. The sex of subjects for the subset of participants in the multiple regression analysis differed among the least progress group. Least progress group subjects in the single hypothesis test in Table 4. were comprised of sixty-two percent females (n = 8) and thirty-eight percent (n = 5) males. The least progress group in the multiple regression analysis was comprised of forty-five percent (n = 4) females and fifty-five percent (n = 5) males. More than one half of the participants in the most progress groups were males, having fifty-two percent in the single hypothesis test and sixty-two percent in the multiple regression analysis.

<u>Duration of Disease</u>. The duration of disease differed for the subset of least progress subjects in the multiple regression analysis who reported a slightly longer (6 to 8 years) duration of disease than those least progress subjects in the single hypothesis test with an average duration of three to five years. Study participants reported an average duration of disease of six to eight years in the most progress group in both the single hypothesis test and the multiple regression analysis. In summary, the study findings in the multiple regression analysis were not appreciably different from the results of the single hypothesis tests for the variables of education, occupation, and exercise compliance. Study participants in the multiple regression analysis were representative of families with higher incomes (\$20,000 to \$24,999 range as compared to an average income of \$17,000 to \$19,999 among participants in the single hypothesis test). Two other differences in the characteristics of study participants (n = 33) in the multiple regression analysis included a preponderance of females in the least progress and a slightly shorter duration of disease (3 to 5 years) for least progress subjects.

Although the variables of education, occupation, and exercise compliance were statistically significant, these variables are of limited practical significance for two reasons. First, the frequency distribution of the responses among clients making the most and least progress toward diastolic blood pressure control is not significantly different. Therefore, clinical application of these findings would be most difficult, given the similarity of responses among subjects in the two study groups. Secondly, exercise compliance is the only variable that clinical providers could impact. The client comes into the health care system with an educational background, an occupation, and a family income that are not impacted upon by health care services.

The following pages summarize the results of the single and multiple hypotheses tests. This summary will also serve as the conclusion to Chapter V.

#### Summary

A summary of single and multiple hypothesis tests is presented in this section.

Hypothesis 1. It is not possible to differentiate be tween the two groups of subjects on the basis of demographic characteristics (age, sex, race, income, education, and occupation) and duration of disease.

Hypothesis 1. was accepted for the variables of sex (p = .38), race (p = .09), and duration of disease (p = .84) in single hypothesis tests.

Hypothesis 1. was rejected for the variables of age (p = .03)and education  $(p \le .01)$  in single hypothesis tests and for the variables of income, education, and occupation in the multiple regression analysis. Hypothesis 2. It is not possible to differentiate between the two groups

> of subjects on the basis of the actual number of symptoms reported and the perceived mean severity of hypertensive symptoms at intake into the study.

Hypothesis 2. was accepted with significance levels of (p = .54) for the actual number of symptoms and (p = .99) for the perceived mean severity of symptoms at intake into the study.

Hypothesis 3. It is not possible to differentiate between the two groups of subjects on the basis of the actual number of symptoms reported and the perceived mean severity of hypertensive symptoms at the six month interview.

Hypothesis 3. was accepted with significance levels of (p = .91) for the actual number of symptoms and (p = .83) for the perceived mean

severity of those symptoms at the six month interview.

Hypothesis 4. It is not possible to differentiate between the two groups of subjects on the basis of the expressed benefits and barriers to following the therapeutic medication and diet regimens at intake into the study.

Hypothesis 4. was accepted with a significance level of (p = .73) for medication beliefs and (p = .72) for diet beliefs at intake into the study.

Hypothesis 5. It is not possible to differentiate between the two groups of subjects on the basis of the expressed benefits and barriers to following the therapeutic medication and diet regimens at the sixth month interview.

Hypothesis 5. was accepted with a significance level of (p = .06) for medication beliefs and (p = .15) for diet beliefs at the six month interview.

Hypothesis 6. It is not possible to differentiate between the two groups of subjects on the basis of their overall knowledge scores at intake into the study.

Hypothesis 6. was accepted with a significance level of (p = .41) at intake.

Hypothesis 7. It is not possible to differentiate between the two groups of subjects on the basis of their overall knowledge scores at the six month interview.

Hypothesis 7. was accepted with a significance level of (p = .14).
Hypothesis 8. It is not possible to differentiate between the two groups of subjects on the basis of self-reported compliance rates for medication taking, diet, and exercise in

nursing intervention sessions I, III, IV, V, VI, and VII.

Hypothesis 8. was accepted for the variables of medication compliance (p = .21) and diet compliance (p = .12).

Hypothesis 8. was rejected for exercise compliance in the single hypothesis test (p = .02) and in the multiple regression analysis.

In Chapter V a description of the data and data analysis procedures were given.

A summary of findings, recommendations for future research and nursing practice, and study conclusions follow in Chapter VI.

#### CHAPTER VI

## SUMMARY, RECOMMENDATIONS, AND CONCLUSIONS

#### OF FINDINGS

This final chapter contains a brief summary of Chapters I through V, recommendations for nursing practice and future research, implications for nursing education, and the conclusions concerning the findings of the study.

#### Summary

A quasi-experimental design was used in an attempt to differentiate the characteristics of fifty-five hypertensive clients who achieved the greatest (n = 42) and the least (n = 13) reduction in their diastolic blood pressures at the completion of a six month experimental nursing intervention, developed by Given (1981). Progress toward blood pressure control was quantified by calculating the difference in the mean diastolic blood pressures in mm of Hg. from the pre-intervention period (screening and first nursing visit mean diastolic blood pressures) to the final nursing intervention session attended, occuring approximately six months after the pre-intervention blood pressure measurements. The emphasis of the Given nursing intervention was to encourage the client to assume the major responsibility for the ongoing control of his/her hypertensive regimen.

The purpose of this study was to contribute to the development of diagnostic categories of those hypertensive clients who achieved the most and least reduction in diastolic blood pressure. King's (1981)

Theory for Nursing provided the goal attainment framework which augmented those selected health belief model concepts studied (patient perceptions, knowledge of disease and of the therapeutic regimen, and compliance with that regimen) to better understand the relationship between health related decision-making and blood pressure control. The Critical Patient Behaviors in High Blood Pressure Control, as proposed by the <u>National High Blood Pressure Education Program</u>, were included in the conceptual framework to operationalize the process of attaining and maintaining adherence to long term therapy.

Study participation was restricted to randomly assigned literate volunteer adults who were eighteen to sixty-five years of age, who were being treated via medication and/or dietary regimens in one of five previously selected primary care settings in Michigan for diagnosed essential hypertension. All study participants attended at least six of the eight nursing intervention sessions and presented with an uncontrolled diastolic blood pressure ( $\leq$  90 mm Hg.) at entry into the intervention. Study participants did not possess other known target organ disease(s) at intake into the study, other than that related to hypertension.

The data collected by Given and Given in their research project <u>Patient Contributions to Care: Link to Process and Outcome</u> (1977-1982), as funded by the Division of Nursing, Health, and Human Services Grant NU 0062-03, was analyzed using a multiple regression analysis to differentiate the characteristics of participants in the two study groups of progress toward blood pressure control. The independent variables included were sociodemographic characteristics (age, sex, race, income, education, occupation); disease duration; and selected health belief model concepts (health perceptions, knowledge of disease and of the

therapeutic regimen and compliance with the therapeutic regimen). The Patient Interview Instruments (Intake Socio-Demographics, Hypertension Severity Scale, the Medication and Diet Belief Scales, and the Understanding Scale) and the standardized Nurse Intervenor Activity Records were used in the retrieval of the Givens' data. These instruments were developed and tested by the Givens and reported to be reliable ( $\geq$  .63 to  $\leq$  .82), as well as construct and content valid.

The profile of hypertensive clients who appear to be the most and the least likely to achieve blood pressure control in previous research was used to hypothesize that progress in achieving blood pressure control could be predicted by differences in the descriptive and independent variables. Those hypertensives making the most progress toward blood pressure control are expected to be of older age, female gender, and have a family income of at least \$6,000 annually, have a minimum of a high school education, have a duration of disease of less than five years, possess a high commitment to medication and diet regimens, and report medication compliance rates of always taking medication(s). Those hypertensives making the least progress toward blood pressure control are expected to be of younger age (less than age fifty), male, have a family income of less than \$6,000 annually, have less than a high school education, possess a lower commitment to medication and diet regimens, and report a medication compliance rate lf less than always taking medication(s). Race and knowledge of disease and therapy are not expected to be related to blood pressure control. The relationship between blood pressure control and occupation. disease duration. the number and mean severity of symptoms, and reported compliance to diet and exercise regimens is not clearly specified in the research

literature and remains to be empirically tested in future studies.

Data analyses yielded a predominantly caucasian, middle class (mean family income of \$17.000 to \$19.999) study population (N = 55) of symptomatic mild hypertensives. Study participants who attained the greatest progress toward blood pressure control (n = 42) had a mean age of 49.6 years, were composed of slightly more males, had a mean educational level of high school, and had a mean employment in clerical/sales to administrative positions. The Most Progress Group also had a duration of hypertension from six to eight years, reported to "not severe" symptoms, had clinically desirable medication and diet beliefs, a moderate level of understanding of disease and therapy, and a mean medication compliance rate of "all the time." The Most Progress Group reported mean diet and exercise compliance rates of more than one half the time. Study participants in the Least Progress Group (n = 13) had a mean age of 43.6 years, were composed of slightly more females, had a mean educational level of some college, and were employed in a mean category of clerical and sales positions. The Least Progress Group also had a mean duration of hypertension from three to five years, reported two "not severe" symptoms, expressed clinically desirable medication and diet beliefs, had a moderate level of understanding of hypertension and its therapy, and reported compliance more than one half the time to medication, more than one half the time to diet, and less than one half the time to exercise.

In tests of single hypotheses, a statistically significant association was found between blood pressure control and age, education, and exercise compliance. Age and exercise compliance rates appear to be

directly related to blood pressure control while education appears inversely related to blood pressure control. No significant association was evident between the other sociodemographic factors of sex, race, family income and occupation; the duration of hypertension; the perceived number and severity of hypertensive symptoms at intake and six months; knowledge of disease and of the therapeutic regimen at intake and six months; the commitment to medication and diet regimens at intake and six months; and self-reported compliance rates to the medication and diet regimens during the nursing intervention.

A six-step multiple regression analysis was performed for the clinical application of study findings to identify the set of predictor variables which accounted for the maximal intergroup variance prior to implementing the Given nursing intervention model (1981). Four significant variables emerged: education, exercise compliance, occupation, and family income. In the following section, the possible implications of subject characteristics for this study are discussed.

# Study Sample

The study sample was limited by its homogeneity and non-representativeness of the population who are most probably in need of long term hypertension control. Groups of hypertensives who are thought to have failed to achieve long term blood pressure control include young adults, black males, the elderly, rural hypertensives, and those persons in the lower socioeconomic groups.

Since this study population was derived from family practice settings, the participants may not have been representative of the overall hypertensive population. Study subjects may have been seeking care in family practice centers for more lengthy office visits with residents, personalized family centered care, or for the quality of the physician and client relationship. Conversely, some persons may be reluctant to secure care in a family practice center for the same reasons. Therefore, this study's findings cannot be generalized beyond middle class, caucasian, family practice clients. Recommendations for changes in this study and a model for applying the study findings to nursing practice follow.

#### Recommendations

The findings of this study should not be taken to either support or refute already available data. This study should be viewed as one attempt to delimit the hypertensive population who would most benefit from the Given (1981) nursing intervention.

# Suggestions for Changes in Study

Given the statistical and practical findings of this study, the investigator would recommend conducting a future study with some or all of the following methodologic alterations.

- 1. Some questionnaire items in the Patient Interview Instruments should be rewritten for clarity. Specifically the following changes should be made:
  - a. On the intake Socio-Demographic instrument, item 13 should be expanded to include the age of the participant at the onset of hypertension. The duration of hypertension cannot be interpreted as a measure of disease severity without ascertaining the chronological age at disease onset.
  - b. On the intake Socio-Demographic instrument, items 8 and 9 should be expanded to include a measure of job related stress. A seven point Likert scale should be added to

measure job related stress levels from "sheer boredom" through "just right" to "on the edge of crises."

- c. Rewrite the Understanding High Blood Pressure instrument to include only application level questions. Examples of application level questions follow. "If you were on a low salt diet to control your blood pressure, which of the following groups of foods could you eat that are low in salt?" (item 17). "When you have unpleasant side effects from your high blood pressure medications you should: . . . " (item 32). "A person who in taking medication for high blood pressure and is losing or gaining weight gradually: ... " (item 34). "If you are taking high blood pressure medications and periodically feel dizzy or faint, you should: . . . " (item 35). Recall level questions may not reflect self-monitoring and problem solving skills. Examples of recall level questions follow. "A blood pressure that is considered normal is: . . . " (item 1). "High blood pressure is caused by: . . . " (item 5).
- d. In the Nurse Intervenor Records on sessions I through VIII, add a graph for the client's self-report on the ease in adhering to treatment regimens. The vertical axis should represent the effort expended while the horizontal axis represents time in weekly intervals. Multicolot ink could be used for coding the amount of ease in adhering to the medication, diet, and exercise regimens. A measure of ease or energy expenditure may identify patterns of progress or temporary set backs in efforts toward blood pressure control

which are not evident in a self-report compliance measure. An alternate measure of ease could include a percentage self-report on the amount of energy required to implement the prescribed medication, diet, and exercise regimens. A percentage measure may allow for a more precise statistical correlation with the self-reported compliance measure.

- 2. Select a more diverse study population with regard to age, race, family income, education, and occupation. If the Givens' data set were used again, a more diverse population might be generated if the requirement of attendance at six of the eight nursing sessions was deleted (random sampling) or altered to require attendance at four sessions.
- 3. Control for the duration of hypertension according to these time intervals: <1 year, ≥1 year and <5 years, ≥5 years and <10 years, and ≥10 years. No published study has compared the health perceptions of hypertensives according to disease duration. Becker (1977) reports that the health beliefs of parents of obese children may be time specific.</p>
- 4. Add at least one additional criterion to the procedure for assigning subjects to study groups to minimize erroneous group assignment. Alterations in the medication regimen, such as a change in the category or dosage of medication would be used as the second criterion for measuring progress toward blood pressure control.
- 5. Compute change scores rather than group means for data analysis. Change scores should be calculated by obtaining the difference in pretest and posttest measures. The use of group means may
have obscured significant findings in the data analysis procedure.

6. Expand the analyses of the least progress group by including all five of the Givens' Belief Scales to measure the health perceptions concerning severity of hypertension, efficacy of therapy, and the effects of job on therapy.

## Suggestions for Future Research Questions

The findings of this study have generated two questions for future research.

- Do the factors of stress and life style preferences clarify the relationship between higher income, education, and occupational status and minimal progress toward blood pressure control?
- 2. Do the transactional intervention strategies (discussed in this study's nursing practice implications) enhance blood pressure control among upper middle class, caucasian, hypertensives?

A discussion concerning the application of the conceptual model follows. Application of Conceptual Model Based on Study Findings

The clinical application of this study's findings involved the assessment phase of the nursing process as presented in the following adaptation of Gordon's (1982) nursing process phases. Simply stated, the concepts in this study should be used in the initial nursing assessment of every hypertensive client in primary care settings to identify dysfunctional health behaviors and to make judgments about the responsiveness of the client to the Given (1981) nursing intervention model. This process can be seen in Figure 3.

M. Gordon's Model (1982) "Steps in the Nursing Process," has been adapted to clarify the process of the client and nurse provider interaction as initially presented in the conceptual framework (Chapter II). The screening of potential hypertensive clients using this model should identify those persons who are the most and least likely to benefit from the Given nursing intervention. The following section contains a description of this assessment process.

The client selection process begins with collection of study variables: age, sex, race, income, education, occupation, duration of hypertension, the actual number and mean severity of hypertensive symptoms, the commitment of health beliefs concerning the diet and medication regimens, the knowledge of disease and of the therapeutic regimen, and reported compliance to medication, diet, and exercise regimens. The client's responses on these variables should then be compared and contrasted with prior research findings and the findings of this study. The nurse provider's emphasis should be on the identification of factors which place that client at risk for a poor health outcome, uncontrolled blood pressure.

The following list of risk factors, derived from the literature review and this study's findings, seem to be associated with an uncontrolled diastolic blood pressure: age less than fifty years; male gender; black race; family income of less than \$6,000 or over \$17,000 annually; less than high school education or post graduate education; blue collar employment or small business operators, lesser professionals and managerial or executive positions; three or more perceived symptoms; low commitment to the medication and/or dietary regimens; a low or a high cognitive understanding of hypertension and its treatment; and reported compliance rates of less than 80 percent of the time with medications, and compliance rates of less than 51 percent of the time to



Application of Conceptual Framework Health Belief Model I. King's Theory of Goal Attainment Critical Outcome Behaviors for Blood Pressure Control



the diet and exercise regimens.

The next phase in this model is to identify those clients who exhibit signs and symptoms of dysfunctional health behaviors. Gordon (1982) defines dysfunctional health behavior as persistent problems or unhealthy patterns. The mere absence of risk factors should not be the only criteria used to arrive at the judgment of "no dysfunctional" health behaviors. A client may demonstrate risk factors and yet possess the motivation and skills necessary to successfully cope with these problems. The label of a dysfunctional health behavior should only be applied to those who have been unable to manage their disease and therapy over time.

Those hypertensives judged to have a possible dysfunctional health behavior should be screened further. In order to prevent dysfunctional health behaviors, those clients at risk for potentially unhealthful behaviors should also be evaluated further. All available data should be analyzed and synthesized to generate a diagnostic hypothesis. Hypothesis testing could most simply be conducted by verbally validating the nursing diagnosis with the client.

Finally, the nurse provider makes a judgment as to the diagnosis's amenability to the Given (1981) nursing intervention. The client should first be informed about the purpose and procedures in this intervention. If the client is unable or unwilling to actively participate in the intervention, that client should be referred to the most appropriate provider. The nurse provider remains responsible for periodic follow up of that client to determine if the client would be amenable to the intervention at some future time. The Given intervention should be promptly implemented for those clients who are able and willing to

participate.

For the purpose of clarity, the term nurse provider refers to that registered nurse providing nursing services to the client in a primary care setting. Given the advanced application of the nursing process, synthesis of research findings, and highly developed interactional skills required of the nurse provider in the implication portion of this chapter, the term nurse provider is intended to refer to a clinical nurse specialist throughout the remainder of this chapter.

In summary, the screening of potential hypertensive clients using this adapted nursing process model should identify those persons with dysfunctional health behaviors who are the most likely to benefit from the Given nursing intervention model as provided by a clinical nurse specialist in a primary care setting. Those hypertensives who do not fulfill the criteria of having dysfunctional health behaviors may still benefit from the Given intervention. The clinical nurse specialist using this model should also rely on clinical judgment for the final determination of potential clients for whom the Given intervention would be appropriate. The implications of this study's findings for nursing practice, education, and research are presented in the following section.

# Primary Care Nursing Implications

The findings of this study are important in the generation of diagnostic categories of hypertensives for whom the Given nursing intervention (1981) is an appropriate intervention strategy. Every clinical nurse specialist has three roles to fulfill in order to maximize nursing's potential in the control of high blood pressure. The first of these roles is the promotion of detection, treatment, and follow-up programs for undetected and uncontrolled hypertensive populations.

Nursing's second role is to delimit target subgroups of hypertensives for whom nursing intervention is clinically effective and cost efficient. This second role has been discussed under the application of the conceptual model in this chapter. The final role is to augment a process of change whereby clients are guaranteed an active role in their health care management. The following strategies are potential methods for utilizing the findings of this study in the first and third role of nurses discussed above.

### Nursing Practice

It is possible that the client's age, education, occupation, family income, and exercise habits may impact the extent to which individual hypertensives engage in health maintenance behaviors. Since the factors of age, education, occupation, and family income are not modifiable in nursing practice, the focus of nursing intervention should be on the establishment of adherence to all components of the therapeutic regimen.

Clients in the most progress group attained progress in blood pressure control. Therefore, no modifications in the Given intervention model or the conceptual model are recommended for hypertensives over the age of fifty, with middle incomes, a high school education, in occupations other than higher executives, and who exercise more than one-half the prescribed frequency.

The following implications are strategies for promoting progress in diastolic blood pressure control among hypertensives under the age of fifty, with at least middle incomes, some college education, and inclerical to executive occupations, with exercise compliance of less than one-half the prescribed frequency. Based on the study characteristics of those hypertensives making the least progress toward blood

pressure control, the nursing practice implications for individual hypertensives at risk for undesirable treatment outcomes are generated from King's (1981) concept of transaction in which an exchange of views about the needs, goals, knowledge, and expectations of the client and clinical nurse specialist occurs (See Figure 1). The goals of the following sequential, pre-nursing intervention strategies are to maximize the client's attention to the clinical nurse specialist's verbal and nonverbal messages; to aid the client in dispelling irrational or inconsistent self-expectations; and to role model to the client his/her potential for success in controlling hypertension. Published books by Dimatteo and Dinicola (1982) and Pender (1982) were also used to validate the appropriateness of these strategies.

The clinical nurse specialist must embrace the client with personal characteristics that are compatible with the client's own socio-economic background. By maximizing some degree of sameness in vocabulary and body language, the client may perceive the clinical nurse specialist as someone with whom rapport can be easily established. The nurse's goal is to attempt to minimize disconfort, distrust, and differences in social norms which could interfere with the client's acceptance of the clinical nurse specialist as a competent and caring professional.

The clinical nurse specialist should portray himself/herself as an effective persuader in order to motivate the client to enter into a professional relationship with the nurse specialist prior to the implementation of any nursing intervention. The clinical nurse specialist can maximize personal power by using self disclosure to establish the client's confidence in his/her competence. Sharing personal beliefs may arouse the client's interest in exploring his/her own values about health and

health care. Hopefully, the client will be able to identify some mutually held belief or opinion upon which to build a professional relationship with the clinical nurse specialist. One method to elicit the client's perceptions is to discuss life style preferences and environmental influences on health. The discussion itself may give the client some insight into why prior health goals were or were not achieved. A pattern of successes, temporary setbacks, lapses in adherence, or deferred therapy may emerge. The nurse can then place the client's current health behavior and perceptions into context with past health experiences.

The clinical nurse specialist could capture the client's attention by offering to provide a needed family service, even if it is not directly related to the primary client's hypertension management. Providing health information, making a referral to a community agency, or assisting the client with a personal concern may reflect the nurse's intentions more clearly than words.

The clinical nurse specialist should exude sincerity, warmth, and self confidence to further reinforce a caring and competent attitude. The most important strategy is for the clinical nurse specialist to emit consistent, continuous, realistic, and sincere positive expectations about the client and family's ability to make decisions in their own best interests. The clinical nurse specialist can help the client to dispell or give less prominence to irrational beliefs or inconsistent self expectations.

The clinical nurse specialist should clarify his/her own motives for providing service to that particular client or family. The client must perceive that the nurse is offering a service which is based upon

the client's self determined need. To accomplish this objective the clinical nurse specialist may need to identify both the positive effects and negative consequences of undertaking an intervention for long term hypertension control. Lastly, the clinical nurse specialist provides the client with the necessary time to make an informed decision about participation in a nursing intervention.

In summary, a series of pre-intervention sessions should be planned to help clients at risk for undesirable health outcomes to anticipate success and begin to envision themselves as competent, self directed, and capable of adjusting to change. This strategy may require from one to three sessions, depending upon the client situation. A considerable data base could be assembled during this time, upon which the nursing intervention could be tailored. Home or work site visits could also be offered to minimize the client's energy expenditure and maximize self confidence in the initial sessions. Home visits may yield a more accurate appraisal of the health perceptions among clients with dysfunctional health behaviors. The client would be expected to maintain his/her personal and social roles in the home, and thus be more likely to share accurate and relevant information.

These transactional strategies may also be applicable to clients who fail to progress through the intervention model; who report increasing difficulty implementing the therapeutic regimen; or who perceive they are not meeting the expectations of themselves or significant others. By interrupting the planned intervention and returning to the transactional strategies, the client and clinical nurse specialist should be able to draw conclusions about the other person's perceptions, roles, and expectations. The transactional strategies assist the client

and clinical nurse specialist to role play the perception modifying process. The identification and sharing of personal needs, concerns, and perceptions helps guide the client toward a more accurate interpretation of the self. This process of clarifying one's perceptions may also lead to the assumption of personal responsibility for health and health-related decision-making.

The clinical nurse specialist must accept the client who declines to accept increased responsibility for hypertension management. The clinical nurse specialist's appraisal of the client's competency for future participation in a nursing intervention should remain constant in subsequent service contacts.

The clinical nurse specialist has an additional responsibility to maximize the success of the National High Blood Pressure Education Program through the offering of advanced nursing practice to groups of hypertensives and to the community. The clinical nurse specialist should exercise leadership in developing health promotion and health maintenance programs, in establishing support groups, and in organizing collaborative community projects.

Group nursing intervention could be achieved through the marketing of a health promotion or hypertension health maintenance package to local employers and occupational health nurses. Particular emphasis should be placed on marketing programs to employers of persons in stressful occupations, such as law enforcement and middle management. Local support groups could also be founded to privide informal lay support for hypertensives and to provide models of healthful living for the community.

A collaborative interdisciplinary project could be developed to

standardize approaches to hypertension in the local community. For example: the identification of local groups at risk for hypertension and poor blood pressure control could begin via collaboration with the local medical society; primary, secondary, and extended care facilities; home health agencies; voluntary organizations, employers, and the media; citizenry; educational institutions; and the public health department. The multipurpose outcome of this joint effort should include not only the identification of local high risk groups, but sugsequent planning to prioritize community health needs, coordinate programs, develop quality of care standards, mobilize resources, and evaluate community progress in controlling hypertension. Funding for this collaborative effort may be available through the state health department or philanthropic organizations.

To insure the success of local programs, more attention should be given to specific program details in order to minimize the barriers to blood pressure screening and treatment. Financial assistance for medical care, prescriptions, transportation, and child care services may be especially important to persons with lower incomes. Clinical flexibility in appointments and provider continuity may be important considerations for higher income clientele. The characteristics and preferences of clients should be taken into account when planning local hypertension programs to minimize barriers to utilizing the available health care services in that community. The community's emphasis should be on coordinating already available services, rather than on competition among providers for revenue and publicity.

Any voluntary community education program must be appropriate to the sociodemographics, health perceptions, and comprehension levels of local

hypertensives. The ideal program should be developed by the interdisciplinary team and contain specific approaches for each local subgroup of hypertensive clients. Two program resource guides: <u>Community Guide to</u> <u>High Blood Pressure Control (1982) and Handbook for Improving High Blood</u> <u>Pressure Control in the Community (1977) are available through the</u> National Institute of Health.

The interdisciplinary team should develop local program guidelines, audiovisual materials, and then categorize these materials according to content, reading level, and program objectives to facilitate utilization by local health care providers. The National Institute of Health has published informational materials which could be used as the primary resources: <u>High Blood Pressure Control</u>: <u>Information and Education Strategies for Messages to Public and Patient Audiences</u> (1982); <u>Printed Aids for High Blood Pressure Education</u>: <u>A Guide to Printed</u> <u>Publications</u> (1981); and <u>Audiovisual Aids for High Blood Pressure <u>Education</u> (1979). Duplicate copies of all educational materials selected or developed by the interdisciplinary team should be made available to the general public in the local library and at employment sites for repeated review.</u>

Lastly, advanced practice nurses must assume collegial responsibility in planning for the long term maintenance of blood pressure control. After an initial nursing intervention is completed, clients should be asked to return to the nurse provider for follow-up visits to reinforce desirable compliance behaviors. The pace of the initial nursing intervention and the frequency of follow-up visits should be individually determined by the client's or group's progress in altering health behaviors. The recommendations from the National High Blood Pressure

<u>Detection and Treatment Program</u> suggest that follow-up care should be scheduled every three to six months for hypertensives with controlled blood pressures. Uncontrolled clients should be seen as frequently as the client and clinical nurse specialist mutually agree upon.

An outready program for the referral of noncompliant clients to nursing service for ongoing home care should be included in the local hypertension program. Protocols for referral, home management strategies, and the use of other health care specialists should be collaboratively developed among primary care providers in the community. The goal of this outreach program should be to develop a tracking system for clients with undesirable clinical outcomes in the hope that more individualized and better coordinated health care will promote blood pressure control (Grim and Grim, 1977).

In summary, the major emphasis of primary care nursing practice implications has been placed on the follow-up care of clients with actual or potential dysfunctional health behaviors. The implications have focused on transactional communication strategies and the coordination of community programs and resources to maximize the client's active involvement in hypertension control. A discussion of educational implications follows.

### Nursing Education

Nursing education has three contributions to make toward long term hypertension control. First, undergraduate and graduate nursing faculty should role model nursing intervention strategies to students while providing primary care services to hypertensives in nurse managed centers. Clinical nurse specialists with expertise in primary care who have joint appointments can both demonstrate and delegate portions of a nursing

intervention to students and staff nurses. Innovative clinical practice settings can be developed for undergraduate and graduate nursing students which will promote the role of the clinical nurse specialist and clarify different levels of practice in nursing.

The second implication for nursing education is to broaden the focus of formal courses and continuing education programs for nurses prepared at the undergraduate level as follows. Educational curriculums and continuing education programs should incorporate topics of group dynamics, communication skills, and negotiation strategies to better prepare nurses for the interdisciplinary experience. In addition, the concept of health beliefs should be gradually introduced into undergraduate curricula and continuing education programs. The educational goal should be for nurses to possess similar understandings of and expertise in applying the health belief model concepts to primary care services. Any intervention which focuses on the alteration of the health perceptions may not be successful if all the nurses do not share a similar understanding of the concepts. Nurse educators should consider recommending particular belief modifying strategies appropriate for subgroups of clients so nurses could have alternate interventions readily at hand.

The third implication for nursing education is the use of the case study as an instructional method for analyzing nursing data relevant to the hypertensive client for the purpose of facilitating students' hypertensive clinical decision-making skills. In summary, the three major implications for nursing education as based on the findings in this study include: role modeling, broadening the focus of formal courses and continuing education programs, and the use of the case study

methodology. A discussion of the implications for nursing research follows.

### Nursing Research

Several areas for further investigation have been identified as based on the findings and limitations of this study.

- 1. Repeat the study with the recommended changes and a more diverse study sample with respect to the duration and severity of hypertion.
- 2. Continue the research focus of the 1980's to delimit subgroups of hypertensives who have failed to achieve blood pressure control after receiving traditional educational interventions.
- 3. Continue the development of other nursing intervention models to address the needs of those hypertensives with poor clinical outcomes.
- 4. Assess the usefulness of the "modifying factors," as labeled by Becker (1974) in the health belief model, in generating diagnostic categories of hypertensives. These modifying factors represent demographic variables (age, sex, race, ethnicity, etc.), sociopsychological variables (personality, social class, peer and reference group pressure, etc.), and cognitive variables (knowledge about the disease, prior contact with the disease, etc.).
- 5. Clarify the explicatory value of the health belief model concepts among hypertensive clients of diverse sociodemographic backgrounds, with varying curations of disease, and with differing knowledge levels of disease and therapy.
- 6. Clarify the concept of time in nursing theories to allow for

the change process in each client as s/he actively learns to accept responsibility for hypertension and its therapy. A specific client assessment tool for the concept of time would be valuable in planning nursing interventions that would neither sensory overload nor sensory deprive the client.

- 7. Assess broader categories of health perceptions, such as in Pender's health promotion model, among middle to upper class hypertensives who are also well educated and employed in managerial and executive occupations.
- 8. Develop other research methodologies to measure the achievement of mutually set goals, to evaluate goal priorities, and to select between intervention alternatives.
- 9. Develop other research methodologies to measure the pattern of compliance behaviors and the degree of ease with which the prescribed therapies are implemented.
- 10. Assess whom subjects identify as significant others in their health decision-making, and measure the importance which significant others have in the formulation of the health perceptions.
- 11. Conduct long term follow-up of clients who have received nursing interventions to determine the effect of the Given nursing intervention (1981) over time.

The areas for future nursing investigation have been presented. In the following section, the major limitations of the conceptual framework are summarized.

## Conceptual Limitations

Several limitations have been identified in the conceptual framework as presented in Chapter II. The conceptual model (See Figure 2) may be an unrealistic explanation for blood pressure control behaviors. Rather, several more detailed models may emerge after continued research which will be highly specific to sugject characteristics, sample selection criteria, health problems, and the requirements of the therapeutic regimen. Health-related decision-making is infinitely more complex than presented in this study.

The conceptual model assumes that clients are capable of comprehending and retaining health information. In reality, clients may not be goal-directed or lack the capability of becoming independent in the self management of their treatment regimens. The transactional strategies discussed in nursing practice implications are one attempt to compensate for this deficiency.

The intent of the conceptual framework was to focus on client characteristics which could predict blood pressure control. The variables selected for study may not have included the factors most relevant to blood pressure control. In retrospect, selecting a broader range of health perceptions, health-related attitudes, and social norms as set forth in Ajzen and Fishbein's (1980) "theory of reasoned action" may have been more appropriate influencers of health behaviors.

Besides the conceptual limitations, there are several methodological limitations of this study. Several of these limitations have been addressed in the suggestions for changes in this study and implications for nursing research.

The expectation of discovering factors that would both explain and

predict human behavior, or as in this study predict blood pressure control, may be too grandiose a goal. It would seem that the investigation process into human behavior may not yield an unambiguous and precise set of empirical generalizations as has been the tradition in physical science research. Cohen (1979) suggests that the current states of behavior science theory and methodology may be inadequate for explicating the relationships among factors inherent in human behaviors.

The findings of this study are important in the generation of diagnostic categories of hypertensives for whom the Given nursing intervention (1981) is an appropriate intervention strategy. Based on the findings of this study and the methodologic difficulties in studying human behaviors, no revisions in the conceptual model have been made. A summary of this study's contributions to the nursing profession follows.

### Summary

The advantages of more precisely understanding the hypertensive client population are threefold. First, the need for more precise discrimination of the health care needs and problems common to categories of hypertensive clients was identified. In particular, the need to better understand the barriers to implementing the therapeutic regimen for middle class mild hypertensives has been acknowledged in this study. Secondly, the scientific investigation of clients with specific blood pressure outcomes was useful in the determination of the results or benefits of the Given (1981) nursing intervention as provided in specific research settings (Zimmer, 1974; Block, 1980). The Given nursing intervention was equally effective in modifying the health perceptions and knowledge of clients making the most and least progress

in blood pressure control. The findings in this study have also facilitated a clarification about the clinical nurse specialist's role versus the contributions of other providers in the long term maintenance of hypertension. Lastly, if the relationship of the clinical nurse specialist's actions to changes in the client's health state continues to become more clear, nursing practice can be revised for the provision of more individualized and less generalized nursing intervention (Bailet, 1975; Given, 1977; Barba, Bennett, and Shaw, 1978; Bloch, 1980; Bruce, 1980; Gordon, 1982). APPENDIX A

CRITERIA AND PROCEDURES FOR SAMPLE SELECTION

### CRITERIA AND PROCEDURE FOR SAMPLE SELECTION

- I. Criteria for inclusion into study:
  - A. Completion of Given and Given research project <u>Patient Contri-</u> <u>butions to Care: Link to Process and Outcome</u> (1977-1982).
  - B. Diastolic blood pressure of > 90 mm Hg. based on average of two screening and pretest (first nursing session) blood pressure measurements.
  - C. Attendance at  $\geq 6$  nursing intervention sessions.
- II. Procedure:
  - A. Compute average of the two screening and pretest diastolic blood pressures (pre-intervention diastolic blood pressure).
  - B. Compute average diastolic blood pressure for last nursing intervention session attended (post-intervention diastolic blood pressure).
  - C. Subtract pre-intervention diastolic blood pressure from post-intervention diastolic blood pressure (diastolic difference).
  - D. Add diastolic differences.
  - E. Compute group median diastolic difference.
  - F. Split sample population at the group median for assignment into study groups:
    - 1. Most Progress Group has a pre-intervention diastolic blood pressure greater than the post-intervention diastolic blood pressure.
    - 2. Least Progress Group has a pre-intervention diastolic blood pressure less than or equal to the post-intervention diastolic blood pressure.

APPENDIX B

CONTACT LETTER

To improve the care we give patients with high blood pressure, our medical and nursing staffs are working with researchers at Michigan State University to help patients better manage their high blood pressure. We are asking many patients, including you, for help in this effort.

Your assistance is important and we hope you will agree to participate in this important project. Your participation will involve responding to a questionnaire--administered by a research interviewer from the University--at your next visit and at two other visits during the next fifteen months. In addition, you may be asked to meet with a staff nurse during the next six months to talk with her about your high blood pressure and its treatment. We hope you will meet with them.

The information you give about yourself and your personal identity will, of course, remain <u>strictly conficential</u>. Should the results of the study be published, you will remain anonymous. You are free to discontinue your participation in this study at any time.

If you do not agree to participate, or should you withdraw from the study after originally agreeing to participate, the amount and quality of service we provide you, naturally, will not change. However, by agreeing to participate, you will help yourself and us to provide better care for all our patients.

To indicate your willingness to participate in this study, please return the enclosed postcard so we can arrange a day and time that will be convenient for you to meet and talk with an interviewer.

Sincerely,

Director, Family Practice

APPENDIX C

CONSENT FORM

## CONSENT FORM

This study in which you are about to participate is designed to find out the beliefs that persons with hypertension have about their disease and treatment. Your participation will involve responding to a questionnaire and permitting University researchers to review your past and future medical records. If you agree to participate, please sign the following statement.

- 1. I have freely consented to take part in a study of patients being conducted by the (Study Site Name) and the College of Nursing and the Department of Community Health Science of the Colleges of Human and Osteopathic Medicine at Michigan State University.
- 2. The study has been described and explained to me and I understand what my participation will involve.
- 3. I understand that if I withdraw from the study after originally agreeing to participate, the amount and quality of service provided me will not change. I understand that I can withdraw from participating at any time.
- 4. I understand that the results of the study will be treated in strict confidence and that should they be published, my name will remain anonymous. I understand that within these restrictions results can upon request be made available to me.

, state that I understand what I, (print name) is required of me as a participant and agree to take part in this study.

Signed \_\_\_\_\_\_(Signature of Patient)

Date

APPENDIX D

NURSE/CLIENT INTERVENTION VISITS

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## NURSE/CLIENT INTERVENTION VISITS

# Visit One/Visit Two

- 1. Client identifies (recognizes) problems in taking medications/following diet.
- 2. Nurse and client set goals for overcoming problems.
- 3. Nurse and client identify solutions for problems.
- 4. Nurse graphs weight, blood pressure.
- 5. Client receives information on disease.
- 6. Nurse and client focus on beliefs about diet and medication-taking.

# Visit Three/Visit Four

- 1. Nurse and client identify barriers to problem-solving.
- 2. Client and nurse identify strategies for solving problems.
- 3. Nurse and client state what client, support person(s), and nurse will do to solve problems.
- 4. Client and/or nurse identify new or unsolved problems.
- 5. Client evaluates compliance and ability to achieve goals.
- 6. Client sets new goals.
- 7. Client selects new alternative solutions.
- 8. Nurse graphs weight, blood pressure.
- 9. Client receives information on specific aspects of therapy, drugs, and diet.

## Visit Five/Visit Six

- 1. Nurse reinforces successful strategies.
- 2. Nurse and client introduce new strategies.
- 3. Nurse emphasizes benefits of medications and diet and success in overcoming problems (barriers).
- 4. Nurse introduces exercise and its benefits.
- 5. Client and nurse identify new goals.
- 6. Client and nurse set strategies to solve problems related to exercise.

### Visit Seven

- 1. Client evaluates ability to achieve goals and progress made.
- 2. Client and nurse identify new problems.
- 3. Client and nurse identify strategies for solving problems.
- 4. Client receives information on complications, extent of control.

## Visit Eight

- 1. Nurse assures client how s/he can continue on his/her own.
- 2. Nurse will be available but client and nurse will not meet on regular basis.
- 3. Client and nurse evaluate effectiveness of program and progress made.

(Given and Given, 1982 p. 50)

APPENDIX E

INSTRUMENTS

Sociodemographic

Hypertension Severity Scale

Beliefs About High Blood Pressure

Understanding High Blood Pressure

Nurse Intervenor Activity Form (Example from Session V)



### SOCIO-DEMOGRAPHIC

The following questions describe general things about you. Please answer all the questions to the best of your ability.

So | 1. Sex: (CHECK ONE) 1. Male 2. Female \_  $(\overline{23})$ 2. Age: (WRITE IN)  $(\overline{24} - \overline{25})$ 3. What is your racial or ethnic background? (CHECK ONE) White \_ 1. 2. Black 3. Mexican-American 4. American Indian 5. Oriental 6. Other (Specify) (26)4. What is your marital status? (CHECK ONE) 1. Married Single; never married 2. 3. Separated 4. Divorced 5. Widowed (27)5. How many living children do you have, including adopted and stepchildren? No living children (CHECK) Number of living children (WRITE IN)  $(\overline{28} - \overline{29})$ 6. Taking all sources of money into consideration, what was your <u>family's total income</u> before to us and other deductions for the <u>past 12 months</u>? (CHECK ONE) 
 OO.
 Below \$5,000

 01.
 \$5,000-\$6,999

 02.
 \$7,000-\$8,999

 03.
 \$9,000-\$10,999

 04.
 \$11,000-\$12,999
 05. \$13,000-\$14,999 06. \$15,000-\$16,999 07. \$17,000-\$19,999 08. \$20,000-\$24,999 09. \$25,000 or over  $(\overline{30} - \overline{31})$ 

-2-7. Are you working now at a regular job, unemployed, retired, a housewife, or what? (CHECK ONE) 1. Working now at regular job \_\_\_\_ L 2. Unemployed or laid off \_\_\_\_ 3. Retired 4. Disabled 5. Housewife 1 1 1 1 6. Other (Specify (32)GO TO QUES. TO 8. What is the main occupation you work at? (What type of work do you do?) (WRITE IN) 9. What kind of business or industry is that in? (What do they make or do?) Is it your own business? (WRITE IN)  $(\overline{33})$ 10. How much schooling have you had (highest grade completed)? (CHECK ONE) 1. None or some grammar school (less than 7 grades completed) Junior high school (9 grades completed)
Some high school (10 or 11 grades) 4. Graduated: high school 5. Technical, business, or trade school  $(\overline{34})$ 11. Who lives in yo r household, besides yourself? (CHECK AS MANY AS APPLY), a. No one else (35) b. Husband/wife (36) c. Children (Write in number living at home) 37-38 d. Other relatives (Write in relationships: example, mother-in-(39-40 law; niece) e. Non-related rersons (Write in: example, 2 friends; 1 boarder) (41-2

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. . .

12. Do you have hypertension? (CHECK ONE) 1. Yes \_\_ 2. No \_\_→(GO TO QUES. 14)  $(\overline{43})$ 13. How long have you had hypertension? (CHECK ONE) 1. Less than one year 2. One to two years 3. Three to five years 7. Fifteen years or more \_  $(\overline{44})$ 14. Do you smoke cigarettes? (CHECK ONE) (45)1. Yes \_\_ 2. No \_\_→(GO TO QUES. 16) 15. How many cigarettes do you smoke in a day? (CHECK ONE) 1. Less than five cigarettes a day \_ Six to nine cigarettes a day
Ten to nineteen cigarettes a day
Twenty to twenty-nine cigarettes Twenty to twenty-nine cigarettes a day 5. Thirty or more cigarettes a day \_ (46)16. Do you.drink alcoholic beverages? (CHECK ONE) 1. Yes \_\_ 2. No \_\_→(GO TO QUES. 18) (47) How often do you drink alcoholic beverages? (CHECK ONE) 17. Occasionally
Weekends only 3. Several times a week 4. One to two drinks a day 5. More than two drinks a day  $(\overline{48})$ 18. Do you have diabetes? (CHECK ONE) Yes \_\_ 2. No \_\_→(GO TO END OF QUESTIONNAIRE) (49)19. How long have you had diabetes? (CHECK ONE) 1. Less than one year 6. Twelve to fourteen years (50)7. Fifteen years or more

END: You have completed this part of the questionnaire. END OF Please begin answering the next section. CARD 02

- 3-

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#### HYPERTENSION SEVERITY SCALE

Now I'm going to ask you some questions about the symptoms (complaints) people with high blood pressure sometimes have. I'm going to ask you to tell me, if, during the last two weeks, you've had any of the following symptoms and, if so, how severe each symptom was.

First, I'll ask you if you've experienced a symptom during the last two weeks. Then, if you have, I'd like you to look at this card and tell me how severe it was. (HAND PATIENT CARD A.) For example, if the symptom was "very severe" tell me "number five (5)." Or, if the symptom was "not severe" tell me "number one (1)." If the symptom was "moderately severe" tell me "number three (3)." Finally, if the symptom was somewhere between "very severe" and "moderately severe" tell me "number four (4)." Or, if it was somewhere between "moderately severe" and "not severe" tell me "number two (2)."

Shall we begin? (READ SYMPTOMS. CIRCLE THE APPROPRIATE ANSWER FOR EACH SYMPTOM IN COLUMN B BELOW. FOR EACH YES ANSWER, ASK: How severe was the CIRCLE APPROPRIATE ANSWER IN COLUMN C.) (symptom)

		В		IF YES IN COLUMN B					
	A SYMPTOMS	РТ. НА	IS SYMP.	C HOW SEVERE					
		Yes	No	Very Severe	M	oderate Severe	ly	Not Severe	
1.	Have you experienced shortness of breath within the last two weeks?	1	2	5	4	3	2	1	(23-24)
2.	Have you experienced pain in your chest within the last two weeks?	1	2	5	4	3	2	1	(25-26)
3.	Have you experienced <u>rapid</u> <u>pounding and beating of</u> <u>your heart</u> within the last two weeks?	1	2	5	4	3	2	1	(27-28)
4.	Have you experienced <u>swelling</u> in your hands and feet within the last two weeks?	1	2	5	4	3	2	1	(29-30)
5.	Have you experienced getting up at night to go to the bathroom within the last two weeks?	1	2	5	4	3	2	1	(31-32)
6.	Have you experienced passing large amounts of water (urine) within the last two weeks?	1	2	5	4	3	2	1	(33-34)
7.	Have you experienced <u>head</u> - <u>aches</u> within the last two weeks? (morning or occipital)	1	2	5	4	3	2	1	(35-36)
8.	Have you experienced <u>a numbness and tingling</u> <u>sensation in your feet</u> within the last two weeks?	1	2	5	4	3	2	1	(37-38)
9.	Have you experienced <u>dizzi-</u> ness or vision changes with- in the last two weeks?	1	2	5	4	3	2	1	(39-40)
10.	Have you experienced an <u>inability to keep your mind</u> <u>on things</u> within the last two weeks?	1	2	5	4	3	2	1	(41-42)

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		В		IF YES IN COLUMN B					
		PT. HAS SYMP.							
	STMPTUMS		No	Very Suvere	Mode	erately Severe	Se	Not vere	
11.	Have you experienced <u>feelings of</u> being miserable and depressed within the last two weeks?	1	2	5	4	3	2	1	(43-44)
12.	Have you experienced <u>feelings of</u> <u>tiredness</u> within the last two weeks?	1	2	5	4	3	2	1	(45-46)
13.	Have you experienced <u>difficulties</u> in <u>sexual activity</u> within the last two weeks?	1	2	5	4	3	2	1	(47-48)
14.	Have you experienced <u>leg cramps</u> within the last two weeks?	1 .	2	5	4	3	2	1	(49-50)
15.	Have you experienced <u>nosebleeds</u> within the last two weeks?	1	2	5	4	3	2	1	(51-52)
16.	Have you experienced any other symptoms within the last two weeks that I haven't mentioned. (IF YES, ASK: What were they? WRITE IN COLUMN A. ASK: How severe was? ? CIRCLE APPROPRIATE ANSWER IN COLUMN C.)								
	a	1	2	5	4	3	2	1	(53-55)
	b	1	2	5	4	3	2	1	$-(\overline{56}-\overline{58})$
	c	1	2	5	4	3	2	1	(00 00)
	•	} 						:	(59-61)

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END OF CARD 78

INTERVIEWER INSTRUCTION: TAKE BACK CARD A WHEN QUESTIONNAIRE COMPLETED.

ENDING INTERVIEW: That's all the questions I have today. We really appreciate your help. I'll be contacting you again in a few months to see how you're getting along. Until then, thanks again for your help.

(1) (2-7) (8) (9-10) (11-13) (14)	Site Pt. No. Type Card No. Date Form	
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### BELIEFS ABOUT HYPERTENSION

Everyone has certain beliefs about hypertension and what helps them to feel better. Below is a list of statements that some people believe about hypertension and the benefits of treatment. Since we are trying to get your feelings or beliefs please indicate the extent of your agreement with each statement. There are no right or wrong answers:

All items are to be circled as follows:

IN/4/79

If you Strongly Agree with the statement then circle <u>Strongly Agree</u>. If you Agree with the statement then circle <u>Agree</u>. If you are Undecided about the statement then circle <u>Undecided</u>.

If you Disagree with the statement then circle Disagree.

If you Strongly Disagree with the statement then circle Strongly Disagree.

1. A person with high blood pressure should stick with his treatment even if he doesn't think he is getting better.

(15)	Strongly	Agree	Undecided	Disagree	Strongly
	Agree				Disagree

2. If my high blood pressure were getting worse I would get help.

(16)	Strongly	Agree	Undecided	Disagree	Strongly
	Agree				Disagre

3. High blood pressure can be a serious disease if you don't control it.

(17)	Strongly	Agree	Undecided	Disagree	Strongly
	Agree				Disagree

4. My high blood pressure is well controlled.

(18)	Strongly	Agree	Undecided	Disagree	Strongly
	Agree				Disagree

5. My high blood pressure would be worse if I did nothing about it.

(19)	Strongly	Agree	Undecided	Disagree	Strongly
	Agree				Disagree

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6.	I believe t	hat I can cor	ntrol my high bl	ood pressure.		-
	Strongly Agree	Agree	Undecided	Disagree	Strongl <b>y</b> Disagree	(28)
7.	In general,	the doctor h	has helped my hi	gh blood pressure	e.	
	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	(29)
8.	High blood	pressure is n	nuch less seriou	s than pneumonia		
	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	(30)
9.	My high blo	od pressure v	will go away whe	n I don't have so	o many other prob	lems.
	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	(31)
10.	So many doc high blood	tors have tal pressure.	lked to me I don	't know what to o	do for my	
	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	(32)
· 11.	The treatme	nt that has l	been prescribed	isn't exactly rid	ght for me.	
	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	(33)
12.	I am not re	ally sure I h	have high blood	pressure.		
	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	(34)
13.	High blood	pressure is n	not <mark>as serio</mark> us a	s some people sag	y.	
	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	(35)
14.	Right now I blood press	have more in ure.	nportant things	to worry about t	han my high	
	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	(36)
15.	High blood	pressure is n	much less seriou	s than diabetes.		
	Strongly Agree	Agree	Undecided	<b>Disagree</b>	Strongly Disagree	(37)
16.	Since my hi	gh blood pres	ssure isn't seri	ous I don't have	to worry so much	•
	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	(38)

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15. Hypertension is not as serious as some people say. (29) Strongly Agree Undecided Disagree Strongly Agree Disagree 16. There is a much better way of taking care of my blood pressure than sticking to a diet and taking medication all the time. (30) Strongly Agree Undecided Disagree Strongly Agree Disagree 17. Right now I have more important things to worry about than my hypertension. (31) Strongly Agree Undecided Disagree Strongly Agree Disagree 18. Hypertension is much less serious than diabetes. (32) Strongly Undecided Agree Disagree Strongly Agree Disagree 19. I have difficulty getting to the health center. (33) Strongly Agree Undecided Disagree Strongly Agree Disagree 20. I just can't do all the things the doctor tells me to do for my hypertension. (34) Strongly Undecided Agree Disagree Strongly Agree Disagree 21. It is hard to be concerned about a disease that doesn't make me feel bad. (35) Strongly Agree Undecided Disagree Strongly Agree Disagree 22. Since my hypertension isn't serious I don't have to worry so much. (36) Strongly Agree Undecided Disagree Strongly Agree Disagree 23. In general I believe my high blood pressure is not serious. (37) Strongly Agree Undecided Disagree Strongly

Disagree

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Agree

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27.	I believe that my medications for high blood pressure will help me to feel better.							
	Strongly Agree	Agree	Undecided	Disagr <b>ee</b>	Strongly Disagree			
28.	I must take I am getting	my high blow g better.	od pressure medio	cations even if	I don't think			
	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree			
29.	I believe th	hat my medica	ations will contr	col my high blood	d pressure.			
	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree			
30.	Taking medio it <b>is.</b>	cation is som	mething a person	must do no matte	er how hard			
	Strongly Agre <b>e</b>	Agree	Undecided	Disagree	Strongly Disagree			
31.	I believe t related to l	hat my medica high blood pa	ations will help ressure.	prevent diseases	s (complications)			
	Strongly	Agree	Undecided	Disagree	Strongly			

EVERYONE WHO HAS HIGH BLOOD PRESSURE HAS TO FOLLOW SOME GUIDELINES FOR EATING (OR A DIET) TO HELP CONTROL HIGH BLOOD PRESSURE. SOME PATIENTS MUST BE CONCERNED WITH CALORIES OR CARBOHYDRATES, OTHERS WITH FAT OR PROTEIN RESTRICTIONS. THE FOLLOWING STATEMENTS DESCRIBE BELIEFS SOME PEOPLE HAVE ABOUT THE DIET THEY MUST FOLLOW. PLEASE INDICATE THE EXTENT OF YOUR AGREEMENT WITH EACH STATEMENT BY CIRCLING ONE CHOICE FOR EACH STATEMENT.

32. Following my diet does not interfere with my normal daily activities.

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	(54)
33.	I am always h	ungry when I	stick to my diet			
	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	(55)
34.	I could follow	w my diet if	I had a step by	step plan.		
	Strongly Agree	Agree	Undecided	Disagree	<b>Strongly</b> Disagree	(56)
35.	I dislike the	tastes of fo	ods on my diet.			
	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	(57)

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	Some Hype:	PATIENTS HAVE RTENSION. IF Y	TO TAKE PILL OU ARE ON PI	S (MEDICATIONS) LLS PLEASE ANSWE	TO HELP CONTROL R THE FOLLOWING	THEIR QUESTIONS.
	32.	I could take m so great.	y medication	regularly if my	family problem	s weren't
	(46)	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
	33.	I am confused	by all the m	edication the do	ctor has given a	ne.
	(47)	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
	34.	I would have to	o change too	many habits to	take my medicat	ions.
	(48)	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
	35.	If I take my m	edications I	may become depe	ndent upon them	
	(49)	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
	36.	I am not inter	ested in tak	ing my medicatio	ns regularly.	
	(50)	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagre <b>e</b>
	37.	Taking my medi	cations inte	rferes with my n	ormal daily act	ivities.
	(51)	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagre <b>e</b>
	38.	I believe that feel better.	my medicati	ons for high blo	od pressure wil	l help me to
	(52)	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
	39.	I must take my am getting bet	high blood ter.	pressure medicat	ions even if I	don't think I
	(53)	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

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40.	I believe that	my medicatio	ons will control	my high blood	pressure.		
(54)	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree		
41.	Taking medicat it is.	ion is someth	ning a person mu	st do no matter	how hard		
(55)	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree		
42.	42. I believe that my medications will help prevent diseases (complications) related to high blood pressure.						
(56)	Strongly Agree	Agree	Undecided	Disagre <b>e</b>	Strongly Disagree		
EVERYONE WHO HAS HYPERTENSION HAS TO FOLLOW SOME GUIDELINES FOR EATING (DIET) TO HELP CONTROL HYPERTENSION FOR SOME PATIENTS IT IS A CONCERN							

EVERYONE WHO HAS HYPERTENSION HAS TO FOLLOW SOME GUIDELINES FOR EATING (DIET) TO HELP CONTROL HYPERTENSION. FOR SOME PATIENTS IT IS A CONCERN FOR CALORIES OR CARBOHYDRATES / FAT OR PROTEIN RESTRICTIONS. PLEASE ANSWER ALL OF THE FOLLOWING DIET (EATING) QUESTIONS.

43. Following my diet does not interfere with my normal daily activities.

(57)	Strongly	Agree	Undecided	Disagree	Strongly
	Agree				Disagree

44. I am always hungry when I stick to my diet.

(58)	Strongly	Agree	Undecided	Disagree	Strongly
	Agree				Disagree

45. I could follow my diet if I had a step by step plan.

(59)	Strongly	Agree	Undecided	Disagree	Strongly
	Agree				Disagree

46. I dislike the tastes of foods on my diet.

(60)	Strongly	Agree	Undecided	Disagree	Strongly
	Agree				Disagree

47. My personal life does not interfere with my diet.

(61)	Strongly	Agree	Undecided	Disagree	Strongly
	Agree				Disagree

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48.	I cannot under	stand what t	the doctor told	me about my diet	:.	
(62)	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	
49.	It has been di	fficult foll	lowing the diet	prescribed for m	be.	
(63)	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	
50.	I have time to	follow the	diet the doctor	ordered for me.		
(64)	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	
51.	I can count on	my family w	when I need help	following my di	let.	
(65)	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	
52.	My husband/wif	e helps me t	o follow my die:	t.	•	
(66)	Strongly Agree	Agree	Undecided	Disagree	Strongly Dísagree	
53.	I believe that related to his	ny diet wil n blood pres	l help prevent o sure.	d <b>iseases (c</b> ompli	cations)	
(67)	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	
54.	I must follow	my diet even	if I don't this	nk I am getting	better.	
(68)	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	
DO YOU WORK OUTSIDE YOUR HOME FOR MONEY EITHER FULL OR PARTTIME? IF YOU DO, PLEASE ANSWER THE FOLLOWING QUESTIONS. IF NOT, THEN YOU HAVE COMPLETED THIS SECTION OF THE QUESTIONNAIRE.						
55.	If I changed j	obs it would	l be easier to t	ake my medicatio	ons.	
(69)	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	
56.	My job does no	t interfere	with taking med	ications.		

(70) Strongly	Agree	Undecided	Disagree	Strongly
Agree				Disagree

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11/19/79

(1) Site
(8) Type 2
(9-10) Card No. 06
(11-13) Date
(14) Form 6

## Understanding High Blood Pressure

AN INPORTANT PART OF LIVING WITH HIGH BLOOD PRESSURE IS TO UNDERSTAND THE DISEASE PROCESS AND THE TREATMENT PRESCRIBED FOR YOU. BELOW ARE A SERIES OF QUESTIONS THAT WILL HELP US UNDERSTAND WHAT YOU KNOW ABOUT HIGH BLOOD PRESSURE. PLEASE CHECK THE ONE CORRECT OR BEST ANSWER FOR EACH QUESTION. IF YOU ARE UNSURE ABOUT THE BEST ANSWER TO ANY QUESTION, PLEASE GUESS AT WHAT YOU BELIEVE WOULD BE THE MOST CORRECT ANSWER.

- CHECK 🗹 ONLY ONE ANSWER.
- 1. A blood pressure that is considered normal is:
- (15) \_\_\_\_ 1. 138/88
  \_\_\_\_ 2. persons age + 100 (for example, age 53 + 100 = BP of 153)
  \_\_\_\_ 3. 160/110
- 2. Persons with high blood pressure who have signs and symptoms should recognize that:
- (16) 1. their blood pressure is out of control
   2. signs and symptoms are an expected part of high blood pressure
   3. signs and symptoms are not closely related to high blood pressure control
  - 3. High blood pressure is a condition that:
- - 4. One way to help control high blood pressure is:
- (18) \_\_\_\_\_ 1. reducing fluid intake \_\_\_\_\_ 2. handling stressful situations \_\_\_\_\_ 3. exercising at least once a week
  - 5. High blood pressure is caused by:
- (19) \_\_\_\_\_\_1. failure of the kidneys to reduce the amount of liquid in the blood
   2. smoking or excess weight which weakens the muscles around the heart
  - 3. no one really knows
- 6. Most patients with high blood pressure:
- (20) \_\_\_\_\_\_ 1. may not feel sick even if they don't take medications
   2. have pain and discomfort only if they don't take medications
   3. fee! bad most of the time whether or not they take medications

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7.	Persons with high blood pressure should probably:
(21)	<ol> <li>begin an active exercise program immediately upon diagnosis</li> <li>wait until blood pressure is under control and then begin an exercise program</li> <li>begin a step by step approach to exercising while blood pressure is being brought under control</li> </ol>
8.	Blood pressure:
(22)	<ol> <li>tells how much force the blood pushes against the walls of the blood vessels</li> <li>is one way to find out if circulation is normal</li> <li>tells how hard the heart is working to pump the blood</li> </ol>
9.	The goal of long term treatment of high blood pressure is to:
(23)	<ol> <li>decrease the amount of work the heart must do</li> <li>decrease bacod press re to slightly below normal</li> <li>maintain a normal blood pressure</li> </ol>
10.	If high blood pressure is not treated the most common complications are:
(24)	<ol> <li>heart attacks and strokes</li> <li>kidney failure and low blood count</li> <li>chronic lung disease</li> </ol>
11.	Which of the following may all be signs or symptoms of high blood pressure:
(25)	<ol> <li>exhaustion, nervousness, and puffy feet</li> <li>shortness of breath, pounding heart, and headaches</li> <li>pain in joints, insomnia, dizziness, and change in vision</li> </ol>
12.	A person is most likely to have high blood pressure when he/she:
(26)	<ol> <li>is overweight by 30 or more pounds</li> <li>is under treatment for diabetes or arthritis.</li> <li>has not smoked for six months, but was previously a heavy smoker for ten years</li> </ol>
13.	Swelling or extra fluid in your body (called edema):
(27)	<ol> <li>may alert you to the need for more potassium</li> <li>2. may cause rings to fit tighter and may cause shortness of breath</li> <li>3. may alert you to increase your blood pressure medications</li> </ol>
14.	Eye changes such as blurring of vision or seeing spots:
(28)	<ol> <li>should never happen to patients who have high blood pressure</li> <li>are signs of serious complications of high blood pressure</li> <li>are signs of minor complications of high blood pressure that should disappear in about two weeks</li> </ol>

- 15. EARLY warning signs of complications affecting the brain could be:
- (29) \_\_\_\_\_ 1. stomach cramps, nausea, vomiting \_\_\_\_\_\_ 2. leg cramps, fatigue \_\_\_\_\_\_ 3. unsteady on your feet, loss of function of arm
- 16. When you are on a diet and are preparing meals for your family you should:
- (30) 1. use dietetic foods as much as possible
   2. use prepared soups rather than gravies as sauces for meats
   3. use a meat rack while roasting foods
- 17. If you were on a low salt diet to control your blood pressure, which of the following groups of foods could you eat that are low in salt?
- (31) 1. hot dogs, baked beans, and carrots
  2. potatoes, chicken salad, and eggs
  3. watermelon, smoked fish, and onions
- 18. Select from the following foods those that are low in salt content:
- (32) 1. onions, beef roast, baked potato
   2. boullion cubes, processed cheese, onions
   3. canned soups, ketchup, potatoes
- 19. Which of the following tips would be helpful for people trying to lose weight:
- (33) 1. eat from a larger plate so it looks like you are eating more food
   2. combine meals so you don't eat so much throughout the day
   3. do not fix different meals for yourself than for your family
- 20. A good way to lose weight would be:
- (34) 1. eat as many foods as possible that are organic or "health foods"
   2. eat as many foods as possible that are high in protein
   3. eat a diet balanced in protein, carbohydrates, and fats
- 21. The typical or usual treatment for high blood pressure includes:
- (35) \_\_\_\_\_\_1. medicines to control blood pressure and diet to control weight
   \_\_\_\_\_\_2. diet to control the blood sugar
   \_\_\_\_\_\_3. a low potassium diet to control the heart rate

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22.	For patients with high blood pressure planned exercise may:
(36)	<ol> <li>improve the ability of the heart to pump</li> <li>help release tension so they can relax</li> <li>reduce the need of a diet to maintain their weight</li> </ol>
23.	Before beginning an active exercise program a person with high blood pressure should:
(37)	<ol> <li>be closely supervised by a nurse or doctor who knows something about medicines</li> <li>decide on an exercise plan you will be able to continue over a long period of time</li> </ol>
24.	3. select a time that is inconvenient so you do not forget to exercise One of the best ways to handle stress (tension, nervousness, and uncomfort- able feelings) is to:
<b>(</b> 38)	<ol> <li>try to find someone who could solve your problem</li> <li>look at the problem and begin thinking about solutions</li> <li>try to avoid thinking about the problem and hope it will go away</li> </ol>
25.	For persons with high blood pressure relaxation methods to control stress can help a person:
<b>(</b> 39)	<ol> <li>learn how to effectively eliminate stress so blood pressure will become controlled</li> <li>learn how to effectively reduce stress so blood pressure will become controlled</li> <li>effectively avoid stresses in their lives so blood pressure will become controlled</li> </ol>
26. (40)	For exercise to be most effective for the person with high blood pressure, the person should: 1. continue exercising until a ward, flushed, and tired feeling occurs 2. exercise several times a month 3. exercise at least three times a week until the pulse increases
27.	Of the following meal plans, the best menu for a reduced calorie, low salt diet for the hypertensive patient would be:
(41)	<ol> <li>salad, chicken, potato chips, pudding, low-fat milk</li> <li>salad, pickles, ham, low-fat milk</li> <li>salad, veal, fruit juice, gelatin</li> </ol>
28.	People with high blood pressure should not smoke because:
(42)	<ol> <li>smoking will alter the effects of the blood pressure medication</li> <li>smoking will increase the blood pressure by affecting the blood vessels</li> <li>smoking will not alter the blood pressure but does effect the heart's pumping action</li> </ol>

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29.	If	weight	control	or	weight	reduction	diet	is	to	help	reduce	blood	pressure,
	it	will:											

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- (43) \_\_\_\_\_1. help control high blood pressure by decreasing the work on your heart

  - 2. work best if 2½ 3 pounds are lost each week
    3. require that the ideal body weight be achieved quickly to help the medication work more effectively
- 30. People with high blood pressure would probably want to avoid exercises such as:
- (44) \_\_\_\_\_ l. weight lifting \_\_\_\_\_ 2. swimming or running \_\_\_\_\_ 3. active sexual intercourse

ANSWER ALL OF THE FOLLOWING QUESTIONS IF YOU ARE ON ANY PILLS FOR YOUR HIGH BLOOD PRESSURE.

- 31. Medications taken for high blood pressure:
- 1. give relief to symptoms by changing the underlying cause
   2. lower blood pressure and give relief to symptoms (45) 3. may make you feel bad and cause symptoms
- 32. When you have unpleasant side effects from your high blood pressure medications you should:
- (46) \_\_\_\_\_ 1. reduce the number of pills you take each day until the side effects have disappeared for three consecutive days \_\_\_\_\_2. keep on taking pills as ordered until your next doctor visit to the doctor
  - 3. call your doctor and report your symptoms
- 33. You should take the high blood pressure drug (pill) the doctor ordered for you:
- because as they help to take off some of the extra weight
   all the time according to the doctor's orders
   until your blood pressure comes down (47)
- 34. A person who in taking medication for high blood pressure and is losing or gaining weight gradually:
- (48) \_\_\_\_\_ 1. should realize that his high blood pressure medication is responsible for the weight change 2. may need to have the amount of medication he is taking changed
   3. should not be too worried about the amount of medication for controlling his blood pressure whether he loses or gains weight
- 35. If you are taking high blood pressure medications and periodically feel dizzy or faint, you should:
- slow down fast body movements
   stand quickly after sitting to get your circulation moving
   ignore these spells because it's something you have to put up with (49) when taking these medications

-6-IF YOU ARE ON WATER PILLS (DIURETICS) FOR YOUR HIGH BLOOD PRESSURE PLEASE ANSWER THE FOLLOWING QUESTIONS. SOME COMMON DIURETICS ARE DIURIL, ESIDRIX, HYDRODIURIL, NATURETIN, LASIX, ENDURON AND SYAZIDE. IF YOU ARE NOT ON WATER PILLS THEN YOU ARE FINISHED WITH THIS SECTION. 36. Which of the following signs would suggest a problem from high blood pressure medication (diuretics or water pills): chest pain, diarrhea, and headaches
 muscle weakness, leg cramps, and tiredness
 hunger, nausea, stomach pains or sweating, (tremors shakey) (50) 37. Diuretics (or water pills) are used to treat high blood pressure in that the medication: 1. lowers blood pressure by acting on the walls of blood vessels (51) 2. lowers the fluid content of the body 3. has a direct effect on the heart which lowers blood pressure 38. Problems with sleeping and feeling "down" might indicate that your blood pressure drug needs to be changed: 39. If you are taking high blood pressure medication you know that: none can cause insomnia (sleeping problems)
 a change in dosage may eliminate the side effects
 they cannot cause the blood pressure to go too low (53)

- 40. If you take water pills:
- (54)
- you will need to carefully control your calories
   eat fresh fruits and vegetables such as grapefruit
   you know that you will always pass a lot of urine even after taking the water pills for awhile

YOU HAVE NOW COMPLETED THIS QUESTIONNAIRE.

Pt. Na	
Pt. I.	D,
Nurse	
Site	

At previous sessions we talked about your prescribed medications, dietary habits, and an exercise program for you. Since your last visit: (CHECK ONE RESPONSE FOR EACH QUESTION.)

SESSION V

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		All the Time	More the	Than ½ Time	5 the Time	Less Than the Time	<sup>1</sup> s None of the Time
۱.	Have you taken your medications:						
2.	Have you taken the proper dosage						
3.	Have you taken them at the prescribed time(s) each day					•	
4.	Have you followed your diet					I	
5.	How often have you exercised in the past week? ( 3 times a week?)	PROBE: Mo	re thar	1 3 time:	s a week, 3 t	imes a week	, or less than
6.	How long was each exercise session?						
7.	What type of exercise did you do?						
8.	what problems did you have following your exercise	e program?			<u>, - 5<sup>-</sup> 5</u>		
· 9.	<ul> <li>What benefits has following your exercise program</li> <li>a) For control of your weight?</li> <li>b) For your ability to sleep better?</li> </ul>	had:					
10.	We've found that some people have problems that m following problems made it difficult for you to f PROBLEM LISTED.)	ake it dif ollow your	ficult exerc	for the ise prog	m to exercise ram? (CHECK	Have any ONE RESPONS	of the E FCR EACH
	<ul> <li>a. Too difficult to follow</li> <li>b. Too many family problems</li> <li>c. Too difficult to change habits to exercise</li> <li>d. Job interferes with exercise</li> <li>e. No time to exercise</li> <li>f. Daily lifestyle interferes with exercise</li> <li>g. Lack of support from family</li> <li>h. Feel sick when I exercise</li> <li>i. Forget to exercise</li> </ul>			Yes Yes Yes Yes Yes Yes Yes Yes		NO NO NO NO NO NO NO	
11.	Do you have any problems not listed that make it	difficult	for you	u to fol	low your exer	cise progra	m?
~	↓						
11 <b>a</b> .	. What are they? (WRITE IN)						
	Other Problems 1						
	2						
	,						
i	J.						

12. We also have found that some people have identified certain benefits in exercising. Are any of the following benefits for you? (CHECK ONE RESPONSE FOR EACH ITEM LISTED.)

a.	Exercise is doing me a lot of good	Yes	No
b.	Exercise is worth the effort	Yes	No
c.	Exercise will have a positive effect on my future health	Yes	No
d.	I feel better	Yes	No
e.	Exercise helps control my high blood pressure	Yes	No
f.	Exercise will prevent complications	Yes	No
g.	Exercise is something one must do no matter how hard it is	Yes	No
'n.	Exercise helps to relieve symptoms of high blood pressure	Yes	No

13. Can you think of other benefits that can result from exercising?

.

	Yes _	No(SKIP TO Q. 14)
13 <b>a</b> .	What are they?	(WRITE IN.)
	Other Benefits	l
		2
		3

- 14. Do you think your exercise has had a positive effect on:
  - a) Your ability to maintain your social and recreational activities?

Yes	No
What are these positive effects?	
Could you tail me why you think it hasn't?	

5)

Your ability to work either at a job or at home?	No
What are these positive effects?	
Could you tall me why you think it hasn't?	

-2-

c) Your life in general?

Yes Yes	No	
What are these positive effects?		
Could you tell me why you think it hasn't?		

- 15. Now let's review and record your blood pressure and weight on the graphs and note the results since your last visit. (GRAPH WEIGHT AND BLOOD PRESSURE MEASUREMENTS.) What progress have you made:
  - a) In your weight? \_
  - b) In your blood pressure control?
- 16. Now I'd like to work with you on an Exercise Master Problem List. First, we'll list those problems or difficulties you think keep you from following your exercise program for high blood pressure. Let's record the most important problems in the first column.
- 17. Look at the list you just prepared. Which of these problems do you really think can be changed? (WRITE IN.)

Why?

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18. Which of these do you think cannot be changed? (WRITE IN.)

- Why?
- 19. What could you do to solve the problems listed in the first column? Let's write what you could do in the second column on the Master Problem List.
- 20. Which problem do you want to try and overcome or solve first? Number this Problem #1. By what date do you think you could accomplish this? Write the date in the third column.
- 21. Which problem would you like to try and overcome next? Number this Problem #2. By what date do you think you could accomplish this? Write the date in the third column.
- 22. How can you incorporate this change (these changes) into your daily life? (WRITE IN.)

23. At previous sessions we've talked about the support family and friends give (can give) in helping you to take your medications (pills) and follow your diet. Who has <u>continued</u> to support you, helping you to take your medications (pills) (who has been able to help you to take your medications (pills)?) .(WRITE IN RELATIONSHIP OF MOST SUPPORTIVE PERSON.)

		No one has helped (SKIP TO Q. 24)
23 <b>a</b> .	Do you feel that his/her support has helped you? YesNo>(SKIP TO Q. 23c)	
235.	In what way has his/her support helped you?	
23c.	Do you feel that more support would be helpful?	
	$\xrightarrow{\text{Yes}} \underbrace{\text{No} \longrightarrow (SKIP TO Q. 25)}$	
23d.	What kind of support would be helpful?	
2 <b>3e</b> .	Have you been able to discuss this with those who give you support?	
23f.	Yes — (SKIP TO Q. 25) No What do you think prevents you from discussing it with them?	
24.	Why naven't you been able to get anyone to help you take your medications (pills)?	
	·····	
24a.	Let's work together to try to think of ways that you can get someone to help you take yo	ur medications
	1	
	2	
	2	
	· · · · · · · · · · · · · · · · · · ·	

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25. Now let's talk about the support you get following your diet. Who has <u>continued</u> to support you, helping you to follow your diet (who has been able to help you to follow your diet)? (WRITE IN RELATIONSHIP OF MOST SUPPORTIVE PERSON.)

No one has helped (SKIP TO Q. 26) 25a. Do you feel that his/her support has helped you? Yes \_\_\_\_\_ No \_\_\_(SKIP TO Q. 25c) 25b. In what way has his/her support helped you? 25c. Oo you feel that more support would be helpful? \_\_\_\_ No → (SKIP TO Q. 27) Yes 25d. What kind of support would be helpful? 25e. Have you been able to discuss this with those who give you support? \_\_\_\_Yes \_\_\_\_(SKIP TO Q. 27) \_\_ No -25f. What do you think prevents you from discussing it with them? 26. Why haven't you been able to get anyone to help you follow your diet? 26a. Let's work together to try to think of ways that you can get someone to help you follow your diet. (LIST.) 1. \_\_\_\_\_ 2. \_\_\_\_\_

.

3. \_\_\_\_

27. Have you been able to identify and use a support person to help you exercise?

•

	$ \operatorname{Yes}  \operatorname{No}  (SKIP \text{ to } Q. 28)$	
27a.	Who has been the most supportive person? (WRITE IN RELATIONSHIP.)	
27b.	How does he/she help you with your exercise program?	
27c.	How could he/she be more supportive?	
27d.	Have you been able to discuss this with him/her? Yes	<b>-</b>
27e.	what do you think prevents you from discussing it with him/her?	
		(SKIP TO Q. 29)
28.	Why haven't you been able to identify and use a support person to help you exercise?	

28a. Let's work together to try to think of ways that you can get someone to help you exercise. (LIST.)

1. \_ 2. \_

3.

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29. Now, thinking back to the problems and solutions we've talked about earlier, let's work together to identify step by step what you are to do, what a support person is to do, and what I am to do to help you get the solutions to work. (WRITE IN.)

	What You Are to Do	What Support Person Is to Do Name(s)	What Nurse Is to Do
Problem			
Solution		•	
1	•		
2			
Problem			
Solution			
1		•	
2			
Problem			
Solution			
l			
2			-

At the last session I asked you to read some material on exercise. Now let's review it and see what questions you have.

30. (REVIEW SESSION ON EXERCISE. LIST QUESTIONS.)

Questions on Exercise

1.	
2.	· · · · · · · · · · · · · · · · · · ·
3.	

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31. Do you have any new questions on your diet or medications?

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Questions on Diet or Medications 1. \_\_\_\_\_ . 2. \_\_\_\_\_ 3.

Let's talk more specifically about complications from high blood pressure. In addition, I'd like you to review Session V on complications prior to our next visit. 1

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LIST OF REFERENCES

## LIST OF REFERENCES

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