THE PERCEIVED MEDICATION, DIETARY, AND JOB BARRIERS TO FOLLOWING A THERAPEUTIC REGIMEN TO CONTROL HYPERTENSION AS IDENTIFIED BY HYPERTENSIVE PATIENTS IN PRIMARY CARE

By

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ABSTRACT

THE PERCEIVED MEDICATION, DIETARY, AND JOB BARRIERS TO FOLLOWING A THERAPEUTIC REGIMEN TO CONTROL HYPERTENSION AS IDENTIFIED BY HYPERTENSIVE PATIENTS IN PRIMARY CARE

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A descriptive study of hypertensive men and women was conducted to identify perceived barriers to following recommended health regimens for controlling hypertension and perceived job barriers to following the health regimens. Data were collected from 158 hypertensive men and women, aged 24 to 65, by means of a self-administered questionnaire. Data were analyzed using Pearson Product Moment Correlations and descriptive statistics. There were significant relationships between beliefs about diet and age, beliefs about medications and educational status, beliefs about medications and systolic blood pressure, and beliefs about impact of job on efficacy of treatment and systolic blood pressure. Hunger, dependence on medications and difficulty following work habits were some barriers identified by this sample population.

Nurses must assess barriers as factors which affect the ability of hypertensive individuals to follow health regimens and how the role of job may also affect the ability to follow health regimens.

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CHAPTER I

THE PROBLEM

Introduction

In the United States nearly 35 million people are estimated to have definite hypertension (high blood pressure), and about 25 million additional people are estimated to have borderline high blood pressure (Glanz, Kirscht, and Rosenstock, 1981). According to the report for the National Institute of Health (1980), hypertension occurs in 20 to 30% of the adult population. Cardiovascular disease accounts for more than one-half of the deaths in the United States, and high blood pressure is a major determinant of such deaths (1980 Report of the Joint National Committee on Detection, Evaluation, and Treatment of High Blood Pressure).

Hypertension's crippling and fatal effects include stroke, heart attack, congestive heart failure, and renal failure. This chronic disease is of great concern since (1) the complications of hypertension are often severe or fatal, and (2) hypertension is usually asymptomatic and the regimen for controlling hypertension permanent (Sackett and Hayes, 1976). Treatment may include taking daily medications, reducing stress, weight reduction and modifying lifestyles.

Although there have been notable increases in the proportion of hypertensive patients who are aware of their problems and who are receiving care, the majority of hypertensive patients' blood pressure remains uncontrolled (Podell, 1975). The increasing importance of chronic conditions has placed a greater emphasis on individual responsibility for health maintenance and care (Gerson and Strauss, 1975). One major reason hypertensive patients remain uncontrolled is the difficulty people have in deciding whether to adhere to a frequently complex health regimen and then maintaining it for a lifetime.

For many years, health care providers have stressed patient education as a way of insuring compliance with prescribed regimens. However, it has been shown in literature on compliance that factual knowledge and information do little to contribute to positive health behaviors (Sackett, et al., 1975). Also, patients' beliefs about their health and the severity of the disease, the ratio between benefits and barriers of the treatment, family stability and behavioral changes have all been positively related to compliance behavior (Haynes, Sackett and Gibson, 1976). With the increasing frequency of chronic conditions has come a greater emphasis on the individual's responsibility for health maintenance and care. This, in turn, has increased the need to understand and modify personal health behaviors (Maiman and Becker, 1974).

One patient centered approach, the Health Belief Model,

is a psychosocial formulation developed to explain personal health behavior at the level of individual decision-making. The Health Belief Model was developed by Hochbaum, Kegeles, Levanthal, and Rosenstock in the 1950's. The Health Belief Model is based on the psychological theory of Lewin who hypothesized that behavior depends on two variables: (1) the value of an outcome to an individual, and (2) the individual's estimate of the probability that a given action will result in that outcome (Mikhail, 1981).

The Health Belief Model is based on the likelihood that a person will take a recommended health action determined by the individual's state of readiness and by the perceived benefits of the action weighed against the perceived barriers (Becker, 1974).

The individual's psychological state of readiness to take action is determined by the perceived susceptibility to a certain health condition and the perceived severity of the consequences of not following an action to reduce the perceived susceptibility. Perceived benefits are weighed against perceived barriers to implementing therapy. Thus, the extent to which benefits outweigh barriers will influence the patient's actual compliance behavior with the recommended health regimen (Becker, et al., 1972).

It is also proposed that an internal or external cue to action must occur to trigger the appropriate action. Finally,

a group of modifying factors will affect the individual's perceptions of susceptibility, severity, and benefits to taking action. The basis of the Health Belief Model is the assumption that behavior is determined by subjective rather than objective thoughts. Thus, health behavior will be determined by an individual's own beliefs about his health and the suggested health regimen.

The results of research studies have led researchers to stress the importance of determining patients' beliefs about their health and suggested health regimens in attempting to increase compliance with a hypertensive regimen. Nelson, et al. (1978), used the Health Belief Model approach to explain compliance with a hypertensive regimen. The hypothesis was that a subject's readiness to comply was conceived as the outcome of certain core perceptions concerning health and hypertension. The researchers predicted that hypertension posed a serious threat that could be avoided by following a therapeutic regimen. Using the interview technique, the researchers found that an individual's experience with anti-hypertensive treatment, his/her attitude toward antihypertensive treatment, and a belief that blood pressure would be higher if suggested health regimens were not followed all influenced compliance. Nelson also reported that individuals who were noncompliant believed their medications caused side effects and believed hypertension disrupted their lifestyle.

In a similar study, Caplan, et al. (1976) found that the presence of somatic complaints and the perceptions that consequences of nonadherence would be serious, contributed to compliance. The focus of both studies was on patient characteristics and attitudes and the researchers found that patient attitudes toward hypertension and its treatment were important determinants of compliance.

Glanz, et al. (1981) examined initial knowledge and attitudes as predictors of intervention effectiveness. One question these researchers asked was, "Do interventions have different effects on individuals who differ with respect to initial attitudes and knowledge?" Findings showed that reminders and self monitoring by nurses improved drug adherence for those with initially lower perceived benefits.

Solomon (1981) developed an approach to the treatment of hypertension directed at increasing the likelihood a client will comply based on how the client views his chronic disease. Solomon examined such areas as expected benefits of treatment, perceived severity of illness, treatment regimen, side effects and cost.

Finally, Given (1978) discussed elderly compliance with antihypertensive medication. The first phase of this research examined the relationships among clients' knowledge, beliefs about benefits and barriers, compliance and the effects of the disease upon their psychosocial health. Preliminary evidence

suggested that clients' lack of knowledge of disease and medications was positively related to negative beliefs about treatment and medication barriers. The evidence also suggested that clients' lack of knowledge of disease and medications was negatively related to medication benefits, beliefs about the disease, and effects of the disease.

Control of hypertension requires that the client enter and continue in a treatment program and adhere to a prescribed regimen. As noted previously, the Health Belief Model has been developed to explain health behaviors that are based on an individual's subjective beliefs. Therefore, it is necessary to examine an individual's subjective perceptions of barriers to following suggested health regimens. If an action is seen as painful, inaccessible, or inconvenient, the individual may be less likely to follow the regimen. Individuals who doubt the safety of a regimen, believe the side effects to be worse than the symptoms, or have to follow a complex regimen may also be less likely to follow recommended health actions.

In order to determine a subject's likelihood of action in following a prescribed regimen, the benefit-barrier ratio must be assessed. It is important to determine if subjects do perceive barriers to following prescribed regimens, because only when the benefits outweigh the barriers will the subject consider following his/her regimen.

Purpose of the Study

The importance of understanding a hypertensive subject's perception of barriers to his/her health regimen provided impetus for this study. It has been emphasized in research literature that it is necessary to identify perceived barriers to determine what constitutes barriers, and how they influence health regimens (Mikhail, 1981). The purpose of this study was to determine what hypertensive subjects perceived as barriers to recommended health regimens by analyzing barriers to commitment to medications, commitment to diet and the impact of job barriers on following health regimens. The data for this study were collected as part of a federally-funded research project "Patient Contributions to Care . . . Link to Process and Outcome" Grant #5R01N000662-01,02,03, B. Given and C. W. Given, co-principal investigators.

Statement of the Problem

In this study, the researcher addressed the following questions:

1. What did hypertensive subjects perceive as barriers to following a diet for controlling hypertension?
2. What did hypertensive subjects perceive as barriers to taking prescribed medications for controlling hypertension?

3. What did hypertensive subjects perceive as job barriers to following a prescribed diet or taking prescribed medications for controlling hypertension?

Definition of Concepts

In this study, the researcher defined the following concepts:

1. Hypertensive subjects. Hypertension is a sustained elevation of blood pressure above the accepted normals of 90 mm Hg diastolic or 140 mm Hg systolic (Price and Wilson, 1978). In this study, hypertensive subjects were individuals between the ages of 18 and 65 who had medical records that contained two blood pressure readings on separate days, indicating diastolic pressure above 90 mm Hg and/or a systolic pressure above 140 mm Hg.
2. Barriers. An individual may believe that a given action will be effective in reducing the threat of disease, but at the same time, see the action itself as being inconvenient, expensive, unpleasant, painful, or upsetting. Perceived barriers were identified as the expressed beliefs and attitudes of the subject concerning barriers to implementing aspects of the therapeutic regimen. Two dimensions of barriers to implementing elements of the

therapeutic regimen were examined: (a) cost, inconvenience, or change in lifestyle; and (b) side effects and discomfort associated with therapy.

3. Dimensions of the therapeutic regimen. The dimensions of the therapeutic regimen that were analyzed in this study included medications, diet, and impact of job on adherence to therapy.

   a. Medication. Medications are prescribed to lower blood pressure to within acceptable ranges following the protocol for hypertensive stepped care. Step 1 would include diuretics. Among diuretics used are thiazide and thiazide derivatives, nonthiazide diuretics, and/or potassium-sparing drugs. Step 2 would include beta-adrenergic inhibitors or beta blockers. Propranolol, Methyldopa, and Reserpine are examples of beta blockers that are used to treat hypertension. Step 3 would include vasodilators. Vasodilators are often added to Steps 1 and 2 drugs and include hydralazine HCL, Clonidine, and Prazosin. Step 4 would include adding or substituting the sympatholytic drug, Guanethidine sulfate to Steps 1, 2, and 3 drugs (Wiener and Pepper, 1979).

   b. Diet. This would include weight reduction diet, low sodium diet, dietary potassium supplement

or any other diet prescribed for lowering and keeping blood pressure to within acceptable ranges.

c. Impact of job on therapy. Social stressors and the individual's social situation may affect health beliefs and health behaviors. One social situation or role with defined goals is job or work role. The importance a subject places on his/her job or the difficulty in carrying out this social role obligation may affect the priority the subject places on performing recommended health behaviors. The values a subject places on performing health behaviors will be related to the beliefs the subject has on how these health behaviors affect ability to perform a job. The value the subject places on following recommended health behaviors could be altered by concern about a job and to what degree the recommended therapeutic regimen interferes with the job.

Assumptions

In this study, the researcher made the following assumptions:

1. It was assumed that perceived barriers were distinct concepts that could be measured.
2. It was assumed that the subject's perceived barriers

could be adequately measured by means of a questionnaire.

3. It was assumed that the subject's answers to the questions were real and honest.
4. It was assumed that the subject could read and understand the questionnaire.

Limitations

The limitations of the study were:

1. The subjects who agreed to participate in the study may be different from subjects who refused to participate in the study. Therefore, the research findings may not be representative of all patients with hypertension.
2. The subjects in the study were not controlled for severity of hypertension or duration of the disease.
3. Patients who received care from Family Practice Physician Residents may have differed from patients who received care from Internists.
4. Due to the small sample size used in this study, the findings may not be generally applicable to a larger population.
5. An individual's perceptions of barriers in this study may change over time. Therefore, the findings in this study may not reflect the perceptions of

the same participants at another point in time.

Overview

The study is presented in six chapters. Chapter I included the introduction to the problem, purpose of the study, statement of the problem, definition of concepts, and assumptions and limitations of the study. Included in Chapter II are the conceptual framework and focuses on the Health Belief Model and how these concepts relate to nursing. In Chapter III, a review of the literature that is pertinent to this research is presented and critiqued. In Chapter IV, the research design, methodology, and procedures utilized in this study are described. In Chapter V, the description of the data and other analyses are given and discussed. In Chapter VI, a summary interpreting the research findings, conclusions, recommendations, and nursing implications of the study are presented.

CHAPTER II

CONCEPTUAL FRAMEWORK

Introduction

Proponents of the Health Belief Model believe that an individual's perception of barriers to aspects of prescribed therapy affect the likelihood of following a recommended health action. Orem believes nurses can help individuals maintain or change conditions within themselves or their environment. If nurses can help hypertensive persons identify perceived barriers to following prescribed regimens, then hypertensive subjects and health care providers can work together to decrease perceived barriers and possibly improve adherence to therapy.

In Chapter II the conceptual framework for this study will be discussed. The Health Belief Model and Orem's self-care model will be analyzed. Variables from each model will be conceptually defined and their relationship to each other and the study questions will be discussed.

Greater emphasis on the individual's responsibility for health maintenance and care is seen as an important factor in decreasing the impact of chronic conditions on morbidity and mortality. This, in turn, has heightened the need for health professionals to understand and be able to modify health

behaviors. It has long been known that people's beliefs, values, and traditions may hinder their seeking health services, even when the services are accessible and effective. It is also known that many people do not enter the health-care system until they are confronted with disabling symptoms (Haefner and Kirscht, 1970).

It is important to remember that care must be directed not only to persuading potential patients to enter the health-care system before symptoms appear, but also to educate patients to adopt certain health practices which they believe will reduce or prevent serious illness (Haefner, 1970). For these reasons, it is important to understand why people follow the health practices they do and to examine methods for modifying these health behaviors.

Hypertension is a major public health problem in the United States. Control of hypertension requires entering in a treatment program and adhering to a prescribed regimen. Medical regimens for blood pressure control can include drug therapy, weight reduction, sodium restriction and stress reduction (Glanz, et al., 1981).

Nonadherence to a medical regimen is a major problem to effective control of high blood pressure. Adherence to recommendations for management of hypertension is often difficult because: (1) the hypertensive condition is often asymptomatic; (2) a patient may experience undesirable side

effects from medication; (3) the regimen may be complicated and demanding requiring periodic medical observation; and, (4) the therapy may have to be continued indefinitely to maintain blood pressure control (Glanz, et al., 1981). In addition, the individual may be expected to change behavior or habits that are well-engrained into his/her lifestyle.

In the past twenty years, numerous research reports have been published reflecting the desire to discover and understand the determinants of health-related actions. In recent years, a psychosocial view for explaining personal health behaviors has received much attention. The basis of the Health Belief Model is that the likelihood of undertaking a health action is a function of the individual's belief that the individual is personally susceptible to a disease, that the occurrence of the disease would have moderate severity or seriousness on some part of his/her life, and that by taking specific action an individual can reduce susceptibility to the disease and overcome barriers (Rosenstock, 1974). One area that is of particular interest is the view of possible psychological and other costs or barriers (Becker, 1974). The primary purpose of this study was to determine what barriers hypertensive subjects perceive to following recommended health regimens specifically in the areas of taking medication, following a prescribed diet and the impact of a job on following therapy.

Conceptual Framework

An adaptation of Rosenstock's Health Belief Model by Becker and Maiman (1975) and Orem's (1980) model of nursing were utilized to develop the conceptual framework for this study. Becker and Maiman's framework is based on the predictive relationship between health perceptions and health behaviors. Orem's nursing theory supports the supportive-educative role of the nurse. For a patient to increase his/her likelihood of action, the benefit-barrier ratio of following a recommended health regimen must be analyzed. Specifically, the barriers to following therapy that the individual perceives must be identified. If the patient's perceived barriers outweigh the perceived benefits, it is more unlikely that the patient will follow the prescribed regimen. Health-care providers and patients must work together to identify patients' perceived barriers and learn to overcome these barriers.

Health Belief Model

The theoretical framework chosen for this study is the Health Belief Model. The Health Belief Model has evolved over 29 years of research and was originally formulated by Hockbaum, Kegalas, Levanthal, and Rosenstock in the public health service (Rosenstock, 1974). The Health Belief Model attempts to account for the predictive relationship between

health perceptions and health behaviors. The model was originally developed to account for preventive health action taken in the absence of symptoms; it has now been reformulated to include a dimension of general health motivation based on measures of concerns and practices that are seen as relatively non-specific and stable across situations (Becker, 1974). This motivating force results from a combination of perceptions and is modified by factors such as demographic characteristics and incidents that trigger behavior (Nelson, 1978).

The core dimensions of the Health Belief Model are derived from a well established body of psychological and behavioral theory, particularly the work of Lewin. Lewin (1938) was interested in a study of human motivation in relation to perceptions. Lewin thought the net effect of simultaneous psychological forces operating in a psychological life space of an individual brought about a reorganization of that field, and thereby provided the basis for psychological behavior.

The basis of the Health Belief Model is that a decision to undertake a health action will not be made unless the individual is psychologically ready to take action relative to a particular threat or cue (Rosenstock, 1974). The model has a phenomenological orientation. The health care provider-individual relationship is the subjective perception of the individual rather than the objective environment. The

individual can only act on what he/she believes to exist though the health care provider may believe another behavior may be more beneficial for the individual. Readiness to act is defined by the extent to which (1) the individual feels susceptible to the condition in question and the extent to which its possible occurrence is viewed as having serious consequences, (2) the individual believes that there are actions which would be beneficial in reducing his/her susceptibility to and/or severity of the condition should it occur, and (3) the individual believes that the psychological costs associated with taking the health action are outweighed by the benefits to be derived (Cummings et al., 1978). As noted before, the original formulation was oriented solely toward the desire to avoid a specific threat and that this approach has been reformulated and expanded to include the dimension of general health motivation (Cummings, et al., 1978).

The basic concepts of the revised Health Belief Model include motivation, perception of the severity of the disease, and perceptions of benefits and barriers associated with actions that can be taken to prevent the disease. These perceptions are affected by demographic, sociopsychological, and structural variables. A "cue" or triggering mechanism is also necessary for initiating appropriate action (Figure 1). This framework has been used as a predictor of preventive health behavior, but there would seem to be no reason why the same

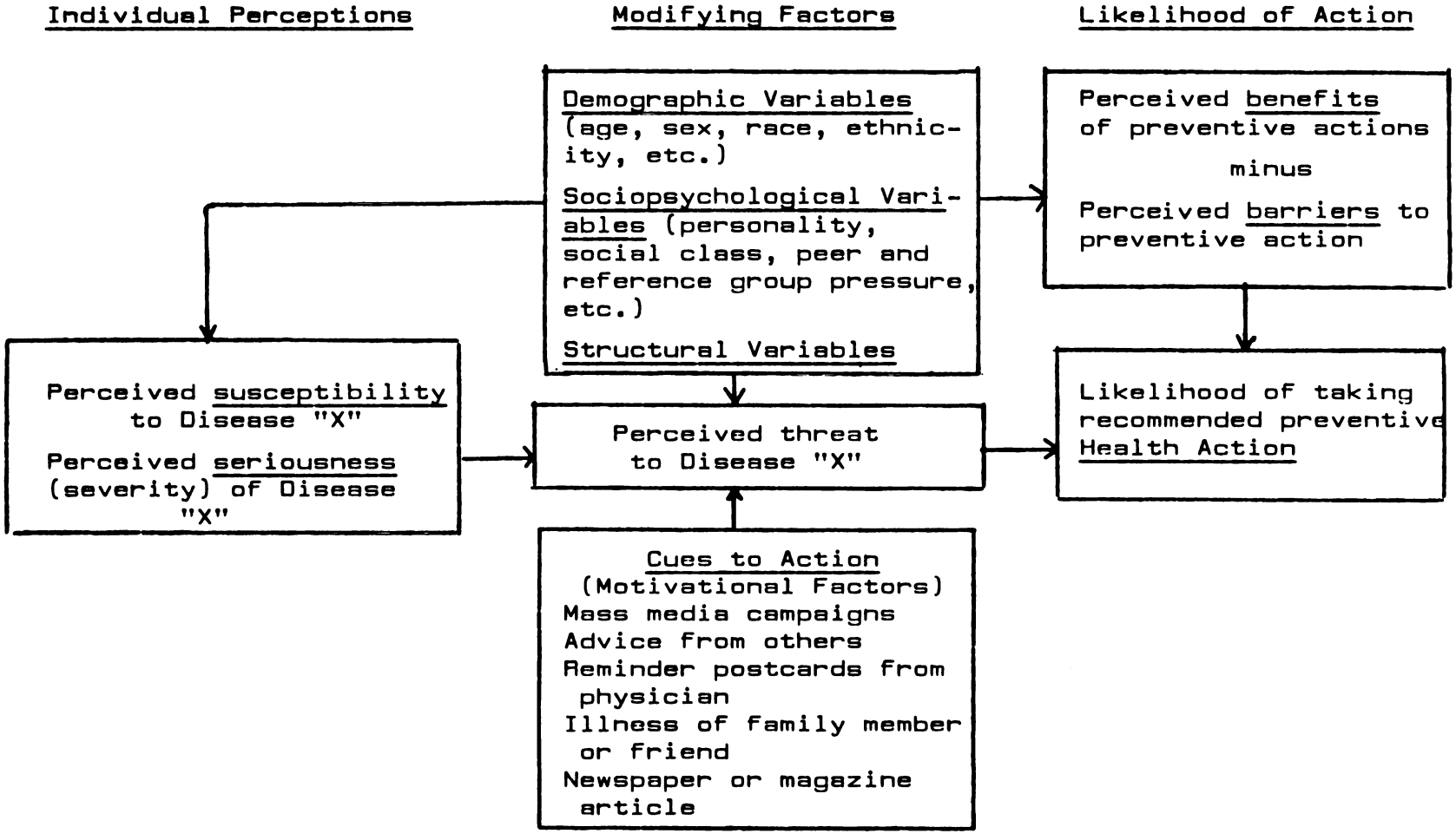

Figure 1. The Preventive Health Belief Model (Becker, 1974).

type of formulation could not apply to action taken by individuals who know they are ill, especially if the concept of susceptibility is broadened to mean the probability of progressive effects of the disease or a recurrence of the disease. The modified Health Belief Model which includes the concepts of motivation, perceived susceptibility, perceived seriousness, perceived benefits, perceived barriers, cues to action and modifying variables is the theoretical framework which was used in this study. In the next section, these variables will be conceptually defined.

Individual Perceptions

In the following section, individual perceptions will be discussed:

1. Motivation. Motivation has been defined as (a) concern about health matters in general, (b) willingness to seek and accept medical direction, (c) intention to comply, and (d) positive health activities (Becker, et al., 1977). An individual, once motivated, will engage in health seeking behavior depending on the amount of threat perceived by the individual and the value of the action to be taken. If an individual perceives many barriers to following a health regimen and if these barriers outweigh the perceived benefits, motivation to comply with suggested health activities may be decreased.

2. Perceived susceptibility. It is believed that individuals vary widely in their perception of personal susceptibility to a condition (Rosenstock, 1974). At one end of the scale may be the individual who denies any possibility of his contracting a disease. In the middle of this spectrum may be the person who admits to the possibility of contracting a disease, but also the possibility that it won't happen. At the opposite end of this spectrum is the individual who believes he/she is in real danger of contracting the disease. Rosenstock defines perceived susceptibility as the subjective risks of contracting a condition (Figure 1). In this study, a diagnosis of hypertension has been made so the individual's feelings of susceptibility to the complications of hypertension will be different than an individual who is concerned he may develop hypertension (Figure 2). The health beliefs of an individual who is diagnosed with hypertension must be modified in a planned way. By helping the hypertensive person identify his/her perceived barriers to following a prescribed regimen, the individual may develop a realistic set of beliefs about his/her susceptibility to the complications of hypertension.

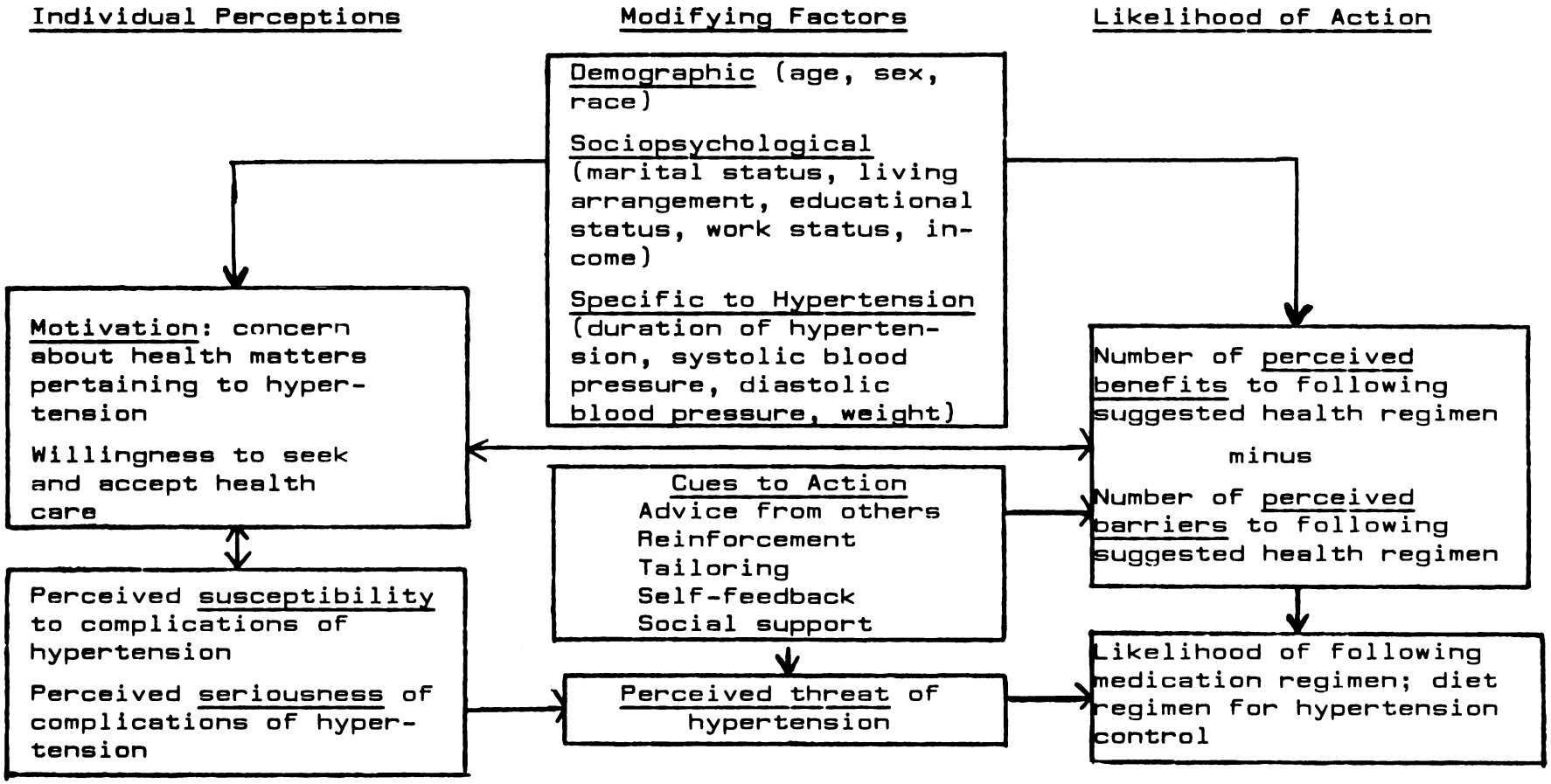

Figure 2. The Health Belief Model specific to hypertension.

3. Perceived seriousness. Perceptions concerning the seriousness of a given health problem also vary from person to person. The degree of seriousness may be judged by the degree of emotional arousal created by the thought of a disease as well as by the kinds of difficulties the individual believes a given health condition will create for him (Robbins, 1962). An individual may perceive seriousness in terms of a medical problem. Perceived seriousness may also include implications of the effects of the disease on an individual's job, family life, and social relationships (Rosenstock, 1974). Susceptibility and seriousness are viewed as the threat component (Figure 1). Even if individuals recognize personal susceptibility, they will not act unless they believe becoming ill will bring serious physical or social repercussions. Again it is important to note that these are the subjective perceptions of the individual and are not related to the objective estimates of a health professional (Becker, 1974).

4. Perceived benefits and barriers. An individual's acceptance of susceptibility to a disease believed to be serious will provide a force leading to action. The direction this action takes is influenced by

the beliefs regarding the effectiveness of alternatives in reducing the disease threat the individual feels (Figure 1). An alternative is seen as beneficial if it relates subjectively to reducing the susceptibility or seriousness of an illness. An individual may believe that a certain action will be effective in reducing the threat of disease, but, at the same time see the action as inconvenient, expensive, unpleasant, painful, or upsetting. These negative aspects act as barriers and arouse conflicting motives of avoidance (Rosenstock, 1974). The hypertensive individual may know the effects of hypertension and know that he/she should follow a prescribed regimen, but, if he/she doesn't understand the regimen or has side effects to the medications he/she may not follow the prescribed health regimen to control hypertension.

The perceived benefits of the regimen to control hypertension are evaluated by the patient for their ability to reduce the threat component and then weighed against the perceived barriers of the regimen. If the positive aspects of following the suggested health regimen are strong and the negative aspects are weak, the hypertensive individual will probably follow the suggested health regimen. If the negative

aspects of following the suggested health regimen are strong and the positive aspects are weak, the hypertensive individual will probably not follow the suggested health regimen (Figure 2). The interrelationship is explained by Maiman and Becker (1974), "An individual's estimate of a prescribed health action's 'benefits' of reducing perceived susceptibility and/or seriousness is weighed against his/her perception of psychological and other 'barriers' to the suggested action." It is necessary to help a patient identify his/her perceived barriers and attempt to overcome these barriers before a patient can be expected to follow suggested health regimens.

5. Cues to action. A factor that serves as a cue to appropriate action is necessary. The combined levels of susceptibility and seriousness provide the energy to act and the perceptions of the benefits or barriers provide a path of action. An event is needed to set this process in motion. These events or cues may be internal (perception of bodily states) or external (interpersonal, interaction with health care provider, social supports, media). The required intensity of the cue to start behavior varies with the differences in the levels of perceived susceptibility and seriousness. Maiman, et al. (1977) states that the cues make the individual consciously

aware of his/her perceptions about his/her condition. These stimuli or "cues to action" are labeled motivational factors (Figure 1) by Becker (1974).

6. Modifying factors. Modifying factors which can influence behavior include demographic variables (age, sex, race, ethnicity, etc.), sociopsychological variables (personality, social status, peer and reference group pressure, income, etc.) and structural variables (such as prior knowledge about problems, prior experience with the problem, and perceived health) (Figure 1). These variables have been used in research and appear to affect compliance. Researchers have found that there is low compliance among the very young and the very old (Blackwell, 1973). Mikhail (1981), Becker (1974), and Haefner and Kirscht (1970), proposed that modifying factors might influence individual perceptions of susceptibility, seriousness and benefits of taking action.

To summarize, proponents of the Health Belief Model assume that an individual will follow a specific health behavior if the individual possesses minimal levels of relevent health motivation and knowledge, feels potentially vulnerable, believes the efficacy of the health behavior and believes that benefits to following the health behavior outweigh barriers.

The probability that an individual with hypertension

will follow a suggested health regimen regarding diet and/or taking medication is affected by the individual's perceived susceptibility to the complications of hypertension and perceived seriousness of the complications of hypertension, willingness to seek and accept health care and the individual's concern about health matters pertaining to hypertension (Figure 2).

The individual's cues to action which include advice from others, reinforcement, tailoring, self feedback, and social support will affect the benefit/barrier ratio which will in turn affect the probability of following a recommended health regimen (Figure 2). Modifying factors which include demographics (age, sex, race), sociopsychological factors (marital status, living arrangements, educational level, work status, and income), and variables specific to hypertension (duration of hypertension, systolic blood pressure, diastolic blood pressure and weight) will affect the individual's motivation and benefit/barrier ratio (Figure 2). Health behaviors are influenced by several elements. The researcher was interested in what barriers subjects perceived to following prescribed regimens concerning diet and taking medication for controlling hypertension. The researcher was also interested in the impact of job on following the health regimens.

The health-care provider can play an important role in helping the hypertensive individual define and change

perceived barriers to following recommended health regimens. Variables of Orem's self-care model and their relationship to the study questions will be discussed in the following section.

Relationship of Nursing to the Study Variables

Orem (1980) believes that nursing is based on the principle that individuals should be helped in their immediate distress and assisted to attain or regain responsibility within their existing capacities. Nurses' major goal, then, is to help individuals or groups under their care to maintain or change conditions in themselves or their environments. Nursing's special concern that differentiates it from other health services is "the individual's need for self-care action and the provision and management of it on a continuous basis in order to sustain life and health, recover from disease or injury and cope with their effects" (Orem, 1980, p. 56). Candidates for nursing intervention are those with deficit or potential deficit relationships between (1) their current or projected capability for providing self-care or dependent care, and (2) the qualitative and quantitative demand for care (Orem, 1980).

Self Care

Orem states that self care, the practice of activities that individuals initiate and perform on their own behalf

in maintaining life, health, and well being is a requirement of every person. Orem categorizes three types of self-care requirements: universal, developmental, and health deviation self care. Universal self-care requisites are associated with life processes and with the maintenance of the structural and functional integrity of the human being. Universal self-care requisites are common to all persons throughout the life cycle adjusted to age, developmental state, and environmental factors. Developmental self-care requisites are associated with developmental processes and life cycle events. Health deviation self-care requisites are concerned with genetic, constitutional, and structural, and functional deficits and with their effects, diagnosis and treatment.

Nursing System

Orem has developed three nursing systems: the wholly compensatory nursing system, the partly compensatory nursing system, and the supportative-educative nursing system based on whether the nurse, the patient, or both can act to meet the patient's self-care requisites. This third system is for situations where the patient can and should learn to perform the required self-care actions but cannot do so without assistance. In this system, the nurse uses techniques such as support, teaching, and guidance. In this system, the patient's need for assistance is related to decision-making, behavior control and acquiring knowledge and skills. There

are a variety of ways nurses can work in this system. The nurse may offer guidance and support to a patient who can perform self-care activities or teaching and periodic guidance to the patient who is competent in self care (Figure 3).

Nursing Process

Nursing is more than simply a combination of all the activities a nurse can perform in behalf of a person under nursing care. Nurses can determine when a person needs nursing, design a system of assistance and provide the delivery of assistance. The process is referred to as the nursing process (Orem, 1980). From this nursing process, a system is developed that will be most beneficial to the individual. Nursing activities are designed through the nursing process and include diagnosis and treatment, design and plan, and production and management (Figure 3).

The nurse's perspective of the health-care situation will be influenced by the hypertensive subject's perception of his/her health situation (Figure 3). The hypertensive subject's perspective of his/her health situation stems from the variables in the Health Belief Model. Motivation, including a willingness to seek health care and concern about health matters pertaining to hypertension, perceived susceptibility and perceived seriousness of the complications of hypertension, the perceived benefit-barrier ratio to following a suggested

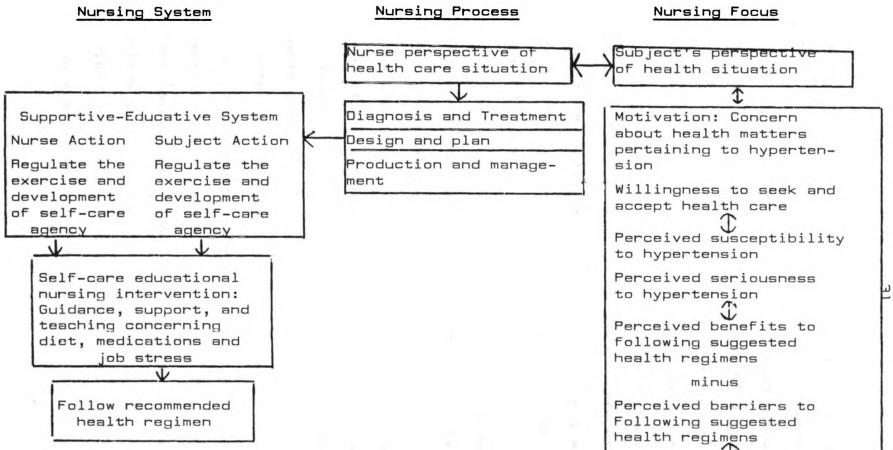

Figure 3. Orem's Model of Supportive-Educative Nursing System (1980).

health regimen including taking medications and following a diet and demographic variables all influence the hypertensive subject's perspective of his/her health situation.

Nurses must assess the hypertensive subject's perspective of his/her health situation. By determining what factors influence the hypertensive subject's behavior, specifically his/her perceived barriers toward health care, nurses can also gain a perspective of the health-care situation. A plan can be formulated in which the patient and nurse can work to decrease the patient's perceived barriers (Figure 3). Since self care is defined as the practice of activities that individuals initiate and perform in order to maintain life, health, and well being, self care is seen as an action, where the patient seeks actions and results (Orem, 1980). Nurses can help the hypertensive individual decrease the number of perceived barriers by supplying knowledge about the disease entity, the medical regimen needed to control hypertension and the lifestyle changes necessary to decrease the effects of the complications of hypertension. The nurse can guide the hypertensive subject in making choices to fit a certain lifestyle and provide support to the subject as he/she makes these changes. By deciding if a patient perceives barriers to his health regimen and by identifying the perceived barriers and the benefit/barrier ratio, the nurse and patient can work together from the patient's perspective to decrease

barriers and increase the likelihood of taking recommended health actions.

Summary

The theoretical framework, the Health Belief Model and the nursing framework, Orem's Self-Care Model were introduced in Chapter II. Pertinent variables were conceptually defined and their relationship to each other and the study questions were analyzed. In Chapter III, a review of the literature on which this study was based will be critiqued.

CHAPTER III

LITERATURE REVIEW

Introduction

In this chapter, relevant literature pertaining to the study variables of perceived barriers to taking medications to control hypertension, perceived barriers to following diet to control hypertension and perceived job barriers will be reviewed. The review will also include literature on hypertension, the health belief model, and nursing interventions for improving health behaviors. Research findings and opinions applicable to these concepts will be presented. This chapter will be divided into the following sections: hypertension, the health belief model, barriers to taking prescribed medications, barriers to following a prescribed diet, job barriers, and nursing strategies for caring for hypertensive individuals. Chapter III is a review of the literature which complements the problem statement and conceptual framework.

Hypertension

The definition of hypertension is somewhat arbitrary. In adults, blood pressure greater than 140/90 mm Hg is considered abnormal. Data reported by the National Health Survey

(1982), showed that only 24% of definite hypertensives (160/95 mm Hg) are in control; 24% are aware of their illness, but not on treatment; and 20% are on inadequate treatment. The remaining 32% of hypertensive individuals are not even aware of their illness.

Hypertension is a major public health problem. It has been shown to reduce the life span and is a risk factor for stroke, heart attack, congestive heart failure, and renal failure. Treatment for hypertension includes drug therapy and diet therapy. Much of the literature about treating hypertension aims at using drug therapy.

More than twenty years ago, treating malignant hypertension with drugs was shown to prolong an individual's life. Bjork, et al. (1961), Leishman (1963), and Hamilton, et al. (1964), proved that treating hypertension with medication reduced the morbidity and mortality in individuals with less severe forms of hypertension.

A controlled study done by the Veterans Administration from 1967 to 1972 (Borhani, 1981) confirmed these observations in men with diastolic blood pressures greater than 115 mm Hg. Benefits of drug therapy were also noted in individuals with diastolic blood pressures of 105-114 mm Hg. This study was a prospective, randomized, double-blind study including 523 males from Veteran Administration hospitals. The participants had well documented hypertension and were randomly assigned to

placebo or active treatment groups. Results showed the efficacy of drug therapy in reducing congestive heart failure, myocardial infarction and stroke.

A five-year study done by the Hypertension Detection and Follow-Up Program Cooperative Group (1982) proved the efficacy of antihypertensive drug therapy in reducing the possibility of stroke. Ten thousand, nine hundred forty individuals with a diastolic blood pressure of 90 mm Hg or higher participated in the study. The participants were randomly assigned to two groups. One group received stepped care and were followed in the Hypertension Detection and Follow-Up Program clinic, while the other group received referred care and were followed in the community by physicians.

Interviews, blood pressure monitoring and mortality surveys were done yearly in both the stepped care and referred care groups. Findings showed a 16.9% reduction in all causes of mortality among the stepped care group compared to the referred care group. Findings for the stepped care group also showed (1) a reduction in incidence of stroke for all ranges of diastolic blood pressure, and (2) a 27% reduction of stroke incidence among subjects aged 30 to 69.

The Framingham study (Kannal, 1978) demonstrated the efficacy of treating hypertension in 5,184 individuals aged 30 to 62. All participants were free of stroke when they entered the program and were followed bi-annually for more

than twenty years. Results of this study showed hypertensive persons had twice as much occlusive peripheral arterial disease, three times as much coronary artery disease, four times as much congestive heart failure and seven times as many brain infarctions as did participants with normal blood pressure. Interestingly, morbidity rates for individuals with their hypertension in control were approximately the same as normotensive participants. The Framingham study supported the premise that hypertension is a powerful precursor to stroke.

The efficacy of treating mild hypertension (diastolic of 95-110 mm Hg) was demonstrated in an Australian study (1980). Three thousand four hundred twenty-seven men and women, aged 30 to 69, with diastolic blood pressures of 95-110 mm Hg participated in the study. Each person was assigned to a placebo or active treatment group and then followed for four years. The results showed a significant decrease in mortality from cardiovascular disease and stroke in the active treatment group.

Stamler, et al. (1980) has questioned the long term use of drug therapy in mild, asymptomatic hypertensive individuals (diastolic blood pressure 90-104 mm Hg). The MRFIT research group (Cohen, 1981) showed the importance of using antihypertensive medications for those individuals with diastolic blood pressures greater than 100 mm Hg, but felt a more conservative approach to blood pressure control be used for individuals with diastolic

blood pressures of 90-100 mm Hg (1982). The Australian Therapeutic Trial found less complications occurred when diastolic blood pressure was brought below 100 mm Hg without using drugs.

Kaplan (1983) suggested using weight reduction for obese individuals, moderate sodium restriction for all and behavior modification approaches for individuals with hypertension who would use them.

Non-Pharmacologic Treatment for Hypertension

A review of literature provides evidence concerning the importance of non-pharmacologic treatment for hypertension. There is interest in using weight reduction and sodium restriction as a means for controlling blood pressure in hypertensive individuals. These approaches are of particular importance to persons with mild hypertension, who may be able to control their hypertension without drugs, but are also useful in persons with more severe hypertension who must use antihypertensive medications to control blood pressure.

Epidemiological studies by Langford (1981) and Fries (1976) show correlations between blood pressure and body weight and blood pressure and sodium restriction. The 1984 report of the Joint National Committee (1984) stated that weight reduction should be an integral part of therapy for obese individuals with hypertension. Patients with essential hypertension should be counseled concerning moderate sodium restriction.

Stamler, Stamler, Riedlinger, Algora and Roberts (1978) reported findings related to weight and blood pressure during a screening of 1,000,000 hypertensive persons. The researchers were interested in the association of estimated weight and the prevalence of elevated blood pressure in persons aged 20 to 64 years. A singular blood pressure was taken by health professionals and weight was estimated as underweight, normal weight or overweight by the participants. Hypertension was defined as a diastolic blood pressure of 95 mm Hg or above or the current use of medication to control blood pressure.

In overweight persons, aged 20 to 39, the rate of hypertension was double that of normal weight persons and triple the rate of underweight persons. In the age group 40 to 64 years, the rate of hypertension was greater than 50% in overweight compared to normal weight individuals and almost 100% greater in overweight individuals compared to underweight persons. Stamler, et al. thus concluded that the association between overweight and high blood pressure may be causative. If this is valid, then weight control could be used to lower elevated blood pressure. There has been some confusion as to whether a decrease in blood pressure is due to sodium restriction, weight loss, or a combination of both.

Reisen, et al. (1978) studied the effect of weight loss on blood pressure with no reduction in sodium intake using hypertensive individuals in Israel. One hundred and seven

patients were enrolled in the study. Criteria for admission included: (1) at least two blood pressure readings of greater than 140 mm Hg systolic and/or 90 mm Hg diastolic; (2) excess weight of more than 10% above ideal body weight; and (3) no antihypertensive drug therapy or inadequate control of blood pressure using antihypertensive medications. Of the 107 participants, 24 were on no drugs and 83 were receiving inadequate drug therapy. The 24 participants receiving no drug therapy and 57 randomly selected patients receiving inadequate drug therapy were placed on a weight reduction program. Males who were 10% above ideal weight received 1200 calories daily while females 10% above ideal weight received 1000 calories each day. Men greater than 20% overweight were placed on a 1000 calorie diet and women were placed on an 800 calorie diet. All participants were encouraged to eat salty foods. All participants visited the clinic every two weeks and were seen by the dietician and physician. After six months, all subjects on the dietary regimen lost at least three Kg (mean 10.5 Kg). Seventy-five percent of individuals who were on the weight loss regimen and not receiving antihypertensive medications and 61% of individuals who were dieting and taking antihypertensive medications achieved normotensive levels. The normotensive blood pressure levels represent a significant ($p = .001$) and direct association between weight loss and blood pressure. The group who followed no weight loss diet

did not attain normotensive levels in blood pressure.

Reisen and associates believed that weight loss had a direct effect on reducing blood pressure and that weight loss could be used to control hypertension in overweight individuals. The results also indicate that it is not necessary to reach ideal body weight to decrease blood pressure to normotensive levels. The researchers believed weight control through dietary measures was an efficient, low-cost way to control blood pressure. Limitations to the findings in the Reisen study could be patient non-compliance with a dietary regimen for an extended period and a health-care provider's inability to individualize an appropriate weight loss program to a hypertensive patient's tastes and economic level.

Tuck, Sowers, Dornfeld, Kledzik and Maxwell (1981) also studied the effect of weight reduction of blood pressure in 25 obese individuals. Subjects were 30 to 182% overweight and 12 subjects had elevated blood pressures above 140/95. All subjects were placed on a 320 Kcal diet. Fifteen subjects (Group A) received 120 mmol of sodium daily and 10 subjects (Group B) received 40 mmol of sodium daily. The subjects were monitored for 12 weeks. There was a significant weight loss in both groups correlating positively with significant and equal decreases in mean arterial blood pressures ($r = 0.58$, $p = .05$). There was also a decrease in urinary sodium excretion which would indicate a decreased sodium intake.

Tuck, et al. monitored plasma renin activity (PRA) and aldosterone levels and felt that blood pressure reductions in obese patients may depend to some degree on PRA and aldosterone reductions. PRA and aldosterone levels were shown to be independent of sodium intake. The results of this study indicate that a 10 to 30% weight reduction can be significant to lower blood pressure to a normotensive range and that individuals do not need to reach ideal body weight to note significant decreases in blood pressure.

Many researchers believe salt ingestion influences blood pressure levels. On a physiological level, hypertension may be a homeostatic response to increased extracellular fluid which results from increased sodium intake. Freis (1976) found that a reduction of sodium in the diet to less than two grams/day did lower blood pressure.

A study by Brown, Brown and Stephens (1982) assessed dietary factors related to elevated blood pressure among Harlem residents. One hundred seven volunteer subjects, aged 5 to 70 years participated in the study. The systolic blood pressure was 80-180 mm Hg and the diastolic pressure was 40-115 mm Hg with a mean blood pressure of 120/78. This normotensive mean reflects the fact that 54.7% of subjects were under 30. Forty percent of the subjects had blood pressures above the normal range for their age. Subjects who reported using salt for cooking and at the table showed a significant elevation of both systolic and diastolic pressures ($r = .05 - .001$).

Brown, et al. reported that subjects who stated they ate salty foods (potato chips, soft drinks) had significant correlations between ingested foods and systolic blood pressures ($r = .05$). Of the subjects who reported eating pork, there was a significant correlation between elevated systolic ($r = .05$) and diastolic pressure ($r = .001$). It is important to note that socioeconomic factors may affect blood pressure in this volunteer group. At the same time, it is important to note that the level of sodium ingestion did correlate with an elevated blood pressure.

MacGregor, et al. (1982) reported a double-blind randomized crossover trial of moderate sodium restriction in essential hypertensives. Nineteen individuals, aged 30 to 66 with systolic pressures from 135 to 185 mm Hg and diastolic pressures of 90 to 110 mm Hg (average pressure 156/98 mm Hg) participated in the 10-week study. All subjects were placed on a no-added salt diet and avoidance of foods with high sodium content. Subjects were instructed on how to follow these restrictions. For one month the subjects received 10 mmol slow sodium tablets. Each subject took the number of tablets necessary to restore his/her sodium intake to the usual amount ingested. The number of tablets varied from 7 to 12. The alternate month the subjects received the same number of placebo tablets. Findings showed a 7.1 mm Hg decrease in mean blood pressure during the month subjects were receiving placebos as compared to the month subjects received slow sodium tablets.

MacGregor found the decrease in blood pressure was the same as that obtained using a diuretic or beta blocker. The researchers suggested that for many patients with mild to moderate essential hypertension, sodium restriction (no added salt, avoidance of salty foods) should be the first treatment. MacGregor, et al. did recognize the difficulty of long-term compliance to a sodium restricted diet and the difficulty in approximating sodium content in foods.

Morgan, et al. (1978) also researched treating hypertension by sodium restriction. The researchers followed patients for two years rather than short-term as in the MacGregor study. Thirty-one Australian subjects with diastolic blood pressures between 95 and 109 mm Hg were treated with a mild sodium restriction regimen. The subjects were instructed to avoid salty foods and not to add salt at the table. This group was compared to a control group who received no treatment (n = 33) and a group treated with antihypertensive medication (n = 62). Compliance was measured through blood pressure and weight readings and 24-hour urine samples. Diastolic pressure in the diet controlled group fell a mean of 7.3 mm Hg compared to the control group whose diastolic pressure rose 1.8 mm Hg. The group receiving antihypertensive medications also had significant decreases in diastolic as well as systolic pressures. The decrease in blood pressure in the diet controlled group was not as great as subjects receiving antihypertensive

medications, but the decrease was enough to put many individuals in the normotensive range. The subjects in the diet controlled group did significantly reduce their sodium intake, but not to the level desired by the researchers and were still able to decrease their blood pressure to normotensive ranges.

Morgan, et al. concluded by noting they do not advocate sodium restriction to 100 mmol/day as a suitable treatment for patients with established hypertension, but that hypertension could be prevented if sodium intake was reduced to 70 to 100 mmol/day. The researchers recognized the "high sodium content of many prepared foods in Australia makes it difficult to reduce intake below 100 mmol/day."

Ram, Garrett and Kaplan (1981) studied the effect of moderate sodium restriction and diuretics for the effect of potassium wasting and blood pressure control in 12 patients aged 28 to 52, diagnosed with mild hypertension (average blood pressure 148/100). The subjects were randomly assigned a high or low sodium diet and various diuretics. The diuretics used in this study included chlorthalidone, hydrochlorothiazide, and furosimide. Each diuretic was given at four-week intervals. Half of the subjects were on either a low sodium (less than 100 mEq of sodium) or high sodium (greater than 150 mEq of sodium) diet. One-third were taking each of the diuretics during each study period. There was a mean fall in blood pressure of 9.1 mm Hg in the group on the high sodium diet compared to a mean

fall of 13.9 mm Hg in the group on the low sodium diet. Potassium levels fell 225 mEq in the low sodium diet group compared to 455 mEq in the high sodium diet group ($p = .05$) documenting that in this study moderate sodium restriction and diuretics produced less potassium loss than high sodium diets and diuretics. Ram, et al. supported the use of sodium restriction (four gram sodium diet) through dietary measures for individuals with minimal elevation in blood pressure and sodium restriction with a single morning dose of a diuretic with intermediate action for people who cannot reduce elevated blood pressure by sodium restriction alone.

Many researchers have found dietary patterns, specifically sodium intake, to be a major contributor to the continued prevalence of high blood pressure in individuals. Research findings from the Morgan study (1978) indicate sodium restriction should be tried before drugs to control hypertension in persons whose diastolic blood pressure is 90-105 mm Hg. MacGregor, et al. (1982) believe that avoiding sodium-rich foods should be part of the management of hypertension and Ram, et al. (1981) believe moderate sodium restriction should be used in conjunction with diuretics to treat hypertension. In contrast, McCarron, et al. (1984) suggest that diets low in sodium are associated with higher blood pressures, while high sodium diets are associated with lower blood pressures.

A study by McCarron, Morris, Henry and Stanton (1984) analyzed epidemiologic data for the association between diet and blood pressure in the United States. Ten thousand, three hundred and seventy-two individuals aged 18 to 74 participated in this study. Data concerning health and nutrition of the participants were obtained through interviews and examinations.

McCarron, et al. found that increased consumption of sodium and potassium were negatively associated with elevated systolic blood pressure (-0.279 and -0.461, respectively). Other findings included deficiencies rather than excesses in nutrients characterize the hypertensive individual; reduced consumption of calcium and potassium are nutritional markers of hypertension and as stated previously, diets low in sodium are associated with higher blood pressures. Though these correlations cannot be accepted as causative of hypertension, the researchers believe they have implications for the association of diet with hypertension.

The value of weight control in hypertension management has been shown. There remains controversy as to whether sodium restriction should be used to control hypertension. A review of the previous studies have shown a positive correlation between diet control and blood pressure control in many studies. The effectiveness of diet in controlling blood pressure depends on the hypertensive patient's ability to adapt to the changes.

In summary, it has been shown that hypertension is a

major risk factor for several health problems. Studies have shown that drug therapy and non-drug therapy are effective in lowering elevated blood pressure, thus reducing the morbidity and mortality of hypertensive individuals. The Veterans Administration studies and reports from the Hypertension Detection and Follow-Up Program indicate that drug therapy is clearly beneficial for individuals with severe and moderate hypertension. Other researchers have questioned the use of antihypertensive medications for persons with mild hypertension, thus renewing the interest in using diet modification for treatment of blood pressure. Yet, there are still a large number of persons who don't know they have hypertension, are being inadequately treated or are not following suggested regimens. Hypertension remains a widespread disease and although detection of hypertension is important, emphasis must also be placed on assisting hypertensive individuals to adhere to regimens and maintain long-term blood pressure control. Nurses must use educational and counseling strategies to help individuals understand and accept hypertension and therapeutic regimens. The Health Belief Model has been widely studied and used to describe why people do or do not follow antihypertensive regimens. One condition of the Health Belief Model is that individuals must believe that benefits of therapy outweigh barriers. In the next section, the Health Belief Model and particularly barriers to care will be discussed.

Health Belief Model

The Health Belief Model postulates that the likelihood an individual will undertake a recommended action is dependent on the individual's subjective beliefs concerning the threat of the illness (perceived susceptibility and severity), the efficacy of the recommended action, and the barriers to beginning or continuing the action. The Health Belief Model was originally formulated to explain preventive health behavior, but researchers have expanded the model to explain other types of behavior. Kirscht (1974) applied the model to illness behavior. Kirscht indicated that symptoms of an illness were important as they may represent a threat to the individual and may arouse health motivation or act as a cue to taking action. Becker (1974) used the model to explain sick-role behavior taken by those who consider themselves ill, for the purpose of getting well.

Kasl (1974) further redefined the Health Belief Model so that behavior taken by individuals with chronic illnesses could be explained. Kasl suggested that chronic illness behavior deserved special attention because the individual has to stay in treatment even though he/she may not feel sick, take medications although he/she could perceive no changes in health status, follow a regimen for an indefinite period of time, and do these with minimal social or institutionalized support.

Finally, Baric (1969) identified an "at risk" role. Baric stated that this role differed from sick role behavior in that an individual in a sick role has certain rights and obligations, whereas the "at risk" role is not formally recognized or reinforced by society, has no time limit, and the individual in the "at risk" role is held responsible for this role.

Studies utilizing the Health Belief Model provide evidence of the model's usefulness in predicting health behavior associated with screening tests for tuberculosis and cervical cancer; preventive actions against dental disease, polio, influenza; use of health services in the presence of symptoms; and adherence to therapeutic regimens while under treatment (Becker, 1974, 1975, 1977; Cummings, 1979).

Mikhail (1981) reviewed Health Belief Model research literature published from 1959 to 1979. Mikhail critiqued studies that addressed various health belief model indices. Perceived susceptibility and perceived severity were found to be related to preventive health actions, sick role actions, and chronic illness behaviors in 15 studies. Eight studies showed that if people believed in the effectiveness of treatment, they were more likely to follow suggested health regimens. In two studies it was shown that if perceived severity was high but ways to cope with the problem were not available to the individual, an appropriate health action was not taken.

Mikhail reviewed studies that addressed barriers to care and found that monetary cost of a regimen was described as a barrier in studies done by Larson, et al. (1979) and Radius, et al. (1978). Other perceived barriers included pain, inaccessibility, inconvenience (Kegeles, 1963; Becker, 1977; Kirscht and Rosenstock, 1977) doubting the safety of a regimen or side effects of a regimen (Haefner, 1970; Haynes, et al., (1976).

Andreoli (1981) analyzed self concept and health beliefs between compliant and non-compliant hypertensive individuals and used the Health Belief Model as the conceptual framework. Seventy-one male patients enrolled in a hypertension clinic in a Veterans Administration Medical Center participated in the study. Forty-one subjects were labeled compliers and 30 were non-compliers. The subjects were categorized as compliers or non-compliers based on a clinical record of their diastolic blood pressure and the nurse's interpretation of their status of compliance. Andreoli measured the Health Belief Model indices of severity of hypertension, susceptibility to hypertension, and the benefits of complying with therapy. The subjects also completed a self-concept questionnaire. The means of the scores on the two scales were compared using a two-tailed t-test. The analyses showed there was no significant difference in scores on the two questionnaires between compliers and non-compliersy. The author concluded there was no difference in

self concept and health beliefs between compliers and non-compliers, and recommended further research to identify characteristics that would differentiate compliers with non-compliers.

As has been noted, the Health Belief Model has been utilized to predict a wide range of health behaviors from behaviors associated with screening tests to behaviors associated with chronic illnesses. Maiman, et al. (1977) tested the reliability of health belief model dimensions as part of a prospective study of mothers' adherence to a diet regimen prescribed for their obese children. The investigators constructed indices to measure each major component of the Health Belief Model and found substantial reliability. There was also some interrelatedness among the constructed indices that might question the independence of the beliefs measured in the study.

Cummings, Jette and Rosenstock (1978), using a multitrait-multimethod design attempted to determine the construct validity of the Health Belief Model. The researchers measured respondents' perceptions of various dimensions of the Health Belief Model. Each perception was measured by three methods. Results determined that the dimensions could be measured with a substantial amount of convergent validity using a Likert or multiple choice questionnaire items.

Finally, Jette, et al. (1981) developed a questionnaire to measure the perception of seven belief dimensions. The questions were taken from questionnaires used in previous studies

and original wording was used where possible. The researchers also used two independent samples of adults in their study. Their findings supported the assumptions that the Health Belief Model dimensions are distinct and different and that reliable indices that measure health beliefs can be developed and replicated.

Thus, the Health Belief Model has been used to measure perceptions of health behaviors in a wide spectrum of studies. This has caused concern about the reliability and validity of the various model dimensions, but recent studies have shown the dimensions to be reliable and valid.

Perceived barriers is one component of the Health Belief Model that impacts health behavior. Perceived barriers have been operationally defined as access to care, convenience, cost, side effects, complexity of regimen, duration of regimen, and how much the regimen interferes with lifestyle.

In the next section, a review of literature of perceived barriers will be presented.

Perceived Barriers

Perceived barriers have been identified as the expressed beliefs and attitudes of an individual concerning barriers to implementing aspects of a suggested regimen (Becker, 1974). Two dimensions of barriers analyzed in the present study were: cost, convenience, or change in lifestyle; and side effects and discomfort associated with therapy.

Several studies have been done to identify individuals' perceptions of barriers to following recommended therapies. If an individual believes that a certain action is inconvenient, expensive, unpleasant, painful or upsetting, the negative aspects may act as barriers to following a prescribed regimen. The monetary cost of a service has been found to be negatively associated with obtaining a service (Larson, et al., 1979; Radius, 1978; Kegales, 1963; Becker, 1977). Kirscht and Rosenstock (1977) found that if individuals perceived a recommended action as painful, inaccessible, or inconvenient, the action was not likely to be followed. Individuals who doubted the safety of a regimen or thought the regimen had side effects were also not likely to follow the suggested regimen (Becker, et al., 1977; Kirscht and Rosenstock, 1977; Taylor, 1979). Finally, the complexity and long duration of a regimen were perceived by individuals as barriers (Haefner, 1970; Haynes, et al., 1976).

The Health Belief Model has been used to predict health behaviors associated with screening tests, acute illnesses, and chronic illnesses. Perceived barriers to adhering to suggested health regimens have included cost, pain, inconvenience, and concern about safety of the regimen. If individuals perceive difficulty in following suggested health regimens for health maintenance or acute problems, health care providers must recognize individuals' perceived barriers to following regimens for chronic conditions that require life-long changes.

If barriers to following regimens can be identified, health-care providers and patients can work together to develop strategies for overcoming barriers. In the next section hypertensive individuals' perceptions of barriers will be discussed.

Hypertensive Subjects' Perceived Barriers to Following Therapy

The problem of patients' adhering to medical regimens is complex. It is known that hypertensive patients who fail to remain in continuous medical care or who are unwilling to follow a prescribed medical regimen may have difficulty successfully controlling their hypertension. It becomes necessary to ask why patients do not follow recommended regimens or what barriers hypertensive patients perceive to following suggested regimens.

A study was done by Caldwell, Cobb, Dowling, and DeJongh (1970) to assess why patients drop out of treatment for hypertension. Using the interview method, stated reasons for not following treatment included poor instruction, side effects of medications, financial need, lack of family support, and dissatisfaction with the suggested program for controlling hypertension. The researchers believed that several factors including socioeconomic status, education regarding the disease and the patients' beliefs about the severity of hypertension and the value of staying in treatment affected adherence to therapy.

Kirscht and Rosenstock (1977) collected data from 132 hypertensive patients of private physicians in order to identify factors that were related to adherence to a therapeutic regimen. These researchers used the Health Belief Model as the basis for their research to determine that hypertensive individuals will follow prescribed regimens based on their feelings about the condition, their vulnerability to the sequalae, the side effects and the benefits or barriers of following the regimen. Results showed that patients who felt susceptible to the sequalae of hypertension, who felt the consequences were serious and who felt the intervention was effective were more likely to follow regimens for controlling hypertension. The perceived barriers to following regimens included side effects of medications and difficulty in following a physician's advice.

Finnerty, Shew, and Himmelsbach (1973) studied hypertensive individuals who dropped out of therapy with an emphasis on perceived barriers to care. Subjects who had stopped following regimens were interviewed. Reasons for stopping treatment or perceived barriers, included inconvenient clinic hours, lengthy waits before seeing the physician, and insufficient time with the health-care professional.

A study by Gillum, Neutra, Stason, and Solomon (1979) identified similar barriers to following regimens for the control of hypertension. The basis of the study was to determine the likelihood that persons being treated for hypertension

would drop out of programs and why these individuals would stop therapy. The clinical courses of patients were followed through their medical records and individuals who stopped therapy were interviewed. Barriers to continuing therapy perceived by individuals included the perceived severity of the illness, the lack of enthusiasm on the part of the health-care providers in treating the mildly hypertensive person, the cost of care and the inconvenience of care. One finding in this study showed that patients with less severe hypertension with no symptoms and without other ailments were more likely to stop therapy.

There were several factors that affected the results of these studies. One important aspect was the socioeconomic status of participants. A second variable was lack of agreement among researchers defining the terms nonadherence or "dropping out" of therapy. Definitions used in these studies included pill counts, prescription refills, number of follow-up appointments, and/or blood pressure levels. Taking these aspects into consideration, it is still possible to see that hypertensive individuals do perceive barriers to following prescribed regimens for controlling blood pressure.

In summary, hypertensive subjects did perceive barriers to following therapeutic regimens which may have included antihypertensive medications and/or dietary measures. Perceived barriers included side effects of medications, lack of support,

cost, and dissatisfaction with the health-care professional. In the next section perceived barriers to taking antihypertensive medications will be discussed.

Perceived Barriers to Taking Antihypertensive Medications

Hershey, Morton, Davis and Reichgott (1980) used an expanded version of the Health Belief Model and analyzed compliance behavior of 132 individuals with hypertension. The participants were randomly selected from a hypertension program and all were taking at least one antihypertensive medication. Health Belief Model indices measured included perceived susceptibility, perceived severity, perceived benefits, concern about health matters, vulnerability to illness, dependence on providers and control over health matters. Of these perceptions only increased control over health matters and increased dependence on providers were positively significant in relationship to compliance.

Hershey and associates found the sociodemographic variables of age, sex, education, work status, and income had no significant effect on compliance. Perceived barriers included side effects, disruption in lifestyle, and duration of treatment. These barriers had a significant negative relationship to taking prescribed medications.

In 1970 Caldwell, et al. examined the dropout problem in antihypertensive drug therapy. Forty-two individuals who

were diagnosed with hypertension but had stopped therapy, were compared with a control group of 24 patients who remained in treatment for hypertension. The authors wanted to determine why patients drop out of therapy.

Caldwell, et al. interviewed individuals who had developed hypertensive emergencies after stopping treatment. These individuals were interviewed twice: once in the emergency room and at another point during the hospitalization. The control group was interviewed during an outpatient appointment. Perceived barriers included poor or inadequate instruction from health-care personnel (N = 42, 36%); lack of income (N = 42, 33%); lack of family support (N = 42, 14%); dissatisfaction (N = 42, 10%); and side effects of medications and discouragement (N = 42, 7%). An interesting statistic was that 39% (N = 42) of individuals stopped treatment because they felt well. It could be assumed that they had not been educated to the fact that feeling well is not the same as being well.

In a later study, Caldwell (1983) assessed psychosocial factors that influence the control of moderate or severe hypertension. One hundred fifty individuals diagnosed with moderate or severe hypertension and were under treatment participated in the study. All patients had been treated for at least one year and were taking two or more medications. Classified by the step care regimen: 1% of the participants were in Step 1; 43% were at Step 2; 43% were at Step 3; and 5% were

at Step 4. Eight percent were taking other combinations of medications. Data were gathered using the interview and chart review methods.

Barriers to following recommended regimens included number of medications taken daily, keeping all scheduled appointments, and complexity of the stepped care regimen. There was a significant positive relationship among the socioeconomic variables of age and marital status and compliance indicating older persons and married persons were more compliant than younger persons or unmarried persons. There was a significant negative relationship between income and compliance. The authors also calculated a Life Events score modified from the Holmes and Rahe Social Readjustment Scale. The scores on this life event scale also had a negative relationship to compliance. The authors concluded by noting that psychosocial and socioeconomic factors could be used to predict which individuals may be less likely to control their blood pressure.

Cummings, Kirscht, Binder and Godley (1982) in a cross-sectional study examined aspects of the Health Belief Model including the relationship of health beliefs, knowledge about hypertension, barriers to receiving medical care, and personal characteristics to drug treatment maintenance in a group of 206 hypertensive individuals. A person was said to be hypertensive if his average diastolic pressure was greater than

95 mm Hg or if the diastolic pressure was less than 95 mm Hg, but the person was under a physician's care for hypertension. Compliance was defined as taking antihypertensive medications as ordered after a diagnosis of hypertension. Interviews and blood pressures were done on each patient. Cummings identified four separate measures of barriers. The first measure pertained to difficulty following physician's advice. The second measure dealt with access to medical care. The third measure was source of medical care and the fourth measure dealt with finances.

Forty-three of Cummings' study participants stated they had stopped treatment on their own. Perceived barriers included side effects 7%, cost of treatment 11.6%, prescription not refilled 20.9%, inconvenience 4.7%, and lack of knowledge concerning medications 2.3%. Again, 39.5% felt fine without the medication which could be a result of inadequate education concerning hypertension or treatment procedures. Another possible reason for stopping medications because the individual felt fine without medication could be low perceived severity and/or lack of enthusiasm from the health-care provider to treat uncomplicated hypertension. The authors concluded that health-care providers must educate their patients to the importance of taking medications even when asymptommatic. The authors also believed that more provider supervision and/or better follow-up may help to decrease perceived barriers.

Brand, Smith and Brand (1977) conducted a descriptive study to determine the effect of economic barriers to following prescribed antihypertensive treatments. Two hundred twenty-five patients were involved in the study. These individuals were classified by the socioeconomic factors of age, education, income, marital status, and severity of disease. Barriers were defined as income status, the number of drugs prescribed for hypertension, and the dose frequency. The socioeconomic factors that affected adherence were age (the youngest and oldest groups had difficulty following regimens); marital status (single and widowed were less adherent), which suggest that family support plays an important role in therapy, education (those individuals with less than six years education were less adherent, and income.

Barriers to not taking prescribed medications in the Brand study included the cost of drugs, the patient's attitude, misunderstanding of physicians' advice, lack of communication between physicians and patients and the number of medications to be taken. To overcome the monetary barriers, Brand, et al. suggested: (1) increase cooperation between physicians and pharmacists when prescribing, (2) establishing an education program to reduce unnecessary use of drugs, (3) provide prescription drugs free of charge to people over 60 years of age who are financially needy.

A study by Nelson, Stason, Neutra, Solomon, and McArdle

(1978) found a significant relationship between side effects and adherence with antihypertensive medication. One hundred forty-two patients participated in the study. Adherence was measured in terms of blood pressure, self-reports, and appointment keeping. Perceived barriers to treatment included perceived time costs and convenience, side effects of medications and impact of treatment on lifestyle. Blood pressure control was associated with efficacy of treatment, taking medications for other chronic problems, and a higher education level. Better appointment keeping was done by older individuals and employed individuals. Results of the study found that improved blood pressure control was affected by the effectiveness of treatment and the potential difficulties associated with having high blood pressure.

To summarize, perceived barriers have been operationally defined in many ways. Medication side effects is one way barriers have been frequently defined and the results of studies have shown that side effects of medications do negatively affect compliance. Kirscht and Rosenstock (1977), Baile and Gross (1979), Hershey, et al. (1980), Nelson, et al. (1978), Caldwell, et al. (1970), and Cummings, et al. (1982) found no significant relationship.

The monetary cost of antihypertensive treatment usually negatively affected adherence (Brand, et al. 1977, Caldwell, 1970; Kirscht and Rosenstock, 1977). A study done by Cummings,

et al. (1982), though, found no significant negative relationship between cost and adherence. Complexity of the regimen (Brand, et al., 1977; Caldwell, et al., 1983) and duration of treatment (Hershey, et al., 1980) were shown to have a negative effect on treatment. Access to treatment was a barrier to care in studies done by Caldwell, et al. (1983) and Cummings, et al. (1982). A study by Logan, et al. (1979) did report a positive relationship between access to care and compliance.

Finally, in studies where the operational definition of barriers was "treatment impact on lifestyle" a negative relationship between treatment and compliance was found (Kirscht and Rosenstock, 1977; Levine, et al., 1979; Nelson, et al., 1978; Hershey, et al., 1980), Caldwell, et al., 1970).

The difference in conceptual definitions of barriers complicates a review of research studies. Perceived barriers have been studied as part of the Health Belief Model or studied singularly as a determinant of compliance. The research variable "barrier" may be termed "barrier" in one study and "modifier" in another. Barriers have also been measured by client perception (self-report) and by researchers (cost, accessibility). The outcome variable to be measured in studies also makes it difficult to identify perceived barriers. Following a prescribed diet, taking medications, blood pressure, and pill counts have all been identified as outcome variables in studies. This wide variety of definitions is seen as a

strength by some researchers and as a weakness by others. Researchers must continue to study perceived barriers in a variety of settings to provide a basis for the design and implementation of health-care interventions.

In summary, research studies have been done that have shown that hypertensive subjects do perceive barriers to taking antihypertensive medications. Perceived barriers include side effects of medications, the cost of the medications, and the complexity of the prescribed drug regimens. In the next section, barriers to following dietary regimens will be discussed.

Perceived Barriers to Following Dietary Regimens

Following dietary regimens to control hypertension appears to be more difficult than taking antihypertensive medications. This may become more of a problem if health-care providers rely on sodium modified diet as the therapeutic regimen for controlling hypertension.

Glanz (1979) suggested that dietary regimens possessed characteristics that foster barriers. Imposing a sodium modified diet is restrictive, forcing lifestyle changes, is often of life-long duration and may be only one of many changes suggested to the hypertensive individual.

Another problem is that the patient may adhere to his/her diet, but not take antihypertensive medications or exercise

regularly which will decrease the effectiveness of the diet. This may increase the patient's frustration with his entire therapeutic regimen. Glanz (1979) suggested possible barriers to dietary regimens would include cost of the food, diet interference with family habits, access to the proper foods and the skill, time, and effort necessary to prepare the food. These concepts were not analyzed as possible barriers in the research analysis.

In a 1980 report, Glanz defined certain characteristics of dietary regimens that may be possible barriers to the patient; dietary regimens are usually restrictive while other regimens are additive; diets are used as a method of control rather than cure; the duration of the diet is often lifelong; lack of support from family, work coherts or health-care providers.

Becker, Maiman, Kirscht, Haefner, and Drachman (1977) in a prospective experimental design, attempted to predict and explain mothers' adherence to a diet prescribed for their obese children. One hundred eighty-two persons claiming to be responsible for the newly diagnosed obese child's daily care participated in the study. The age range was 17 to 62 years. The interview technique was used to gather information. Barriers identified were perceived safety of the diet, difficulty implementing the diet, family problems and difficulty getting through the day.

The operational definitions of barriers to diet has

varied among studies. MacGregor, et al. (1982) suggested barriers to following specified diets might include inadequate food labelling of sodium content, lack of support from family or health-care providers and difficulty controlling sodium intake when dining out or travelling. These potential barriers were not addressed in the study. Morgan, et al. (1978) suggested that high sodium content in prepared foods may act as a barrier to following recommended diets but did not pursue this possible relationship in their study.

Knapp (1978) investigated diet compliance in obesity. One hundred new patients in a clinic were randomly assigned to one of five diets. Forty-six percent of the subjects had been told by physicians to lose weight for health reasons. Four of the diets were outlined with specific meals to follow. The fifth diet plan listed foods and their caloric intake. All diets were approximately 1000 calories. Knapp found that more subjects followed the diet that required modifications or restriction. This diet was high in carbohydrates and fats which may be similar to the diets normally consumed by these subjects. Barriers for not remaining in this program were not discussed by the researchers although non-compliance in this study was 37 to 95%.

In summary, researchers have shown that weight loss and/or sodium restriction are beneficial in reducing elevated blood pressure. Researchers have hypothesized that it is

more difficult for hypertensive individuals to follow low sodium or weight reduction diets than it is to take antihypertensive medications (Glanz, 1979) and patient with dietary regimens is generally assumed to be poorer than with medication regimens. Dietary regimens are often more difficult to follow because they tend to be restrictive, require changes in lifestyle behaviors, are of lifelong duration, and may be one of many aspects of a health regimen (Glanz, 1979). One problem in several studies is that possible barriers to following dietary regimens have been suggested, but actual perceived barriers to following dietary regimens have not been identified. Needed are studies of perceived barriers to following dietary regimens for controlling hypertension which can be used by health-care providers to design appropriate interventions to improve compliance.

Perceived Job Barriers to Following Antihypertensive Therapy

Hypertensive patients' social situations may affect their beliefs about following recommended health regimens. Work status or job is one significant social role obligation that may impinge on a person's ability to follow a prescribed diet or take prescribed antihypertensive medications. Social stressors have been defined as those circumstances that an individual considers to be problematic or undesirable. As has been discussed, following a health regimen to

control hypertension often requires changes in lifestyle patterns. Individuals may already be facing stressors associated with work and find it difficult to follow recommended health regimens. In other words, the role obligations of work status or job may produce enough stress or obligation and the hypertensive individual may be devoting more attention and energy to carrying out job obligations that there is no energy left to follow health regimens (Given, 1982).

A review of the literature failed to show how a job may affect an individual's ability to follow a therapeutic regimen. However, studies have shown that the chronic disease, hypertension, does affect an individual's job. Charlson, Alderman, and Melcher (1982) studied a work-site population in an effort to determine whether patients newly labelled as having hypertension experienced increased absenteeism due to illness. Charlson studied absenteeism days in 259 hypertensive subjects for one year after they were screened and labelled hypertensive.

Criteria for being labelled hypertensive included a blood pressure equal or greater than 150/90 on two separate occasions for those 30 years of age or less and a blood pressure equal or greater than 160/95 for those individuals 30 years or more and/or taking antihypertensive medications. Of the 259 subjects, 211 were previously aware they were hypertensive and 48 were previously unaware. Findings showed that

before screening, the unaware subjects had significantly less absenteeism than did the aware subjects and that after screening absenteeism in the unaware group rose significantly but stayed the same in the aware group. It is interesting to hypothesize that the unaware subjects adopted sick role behavior after being diagnosed as hypertensive, especially if sick role behavior is identified as the "activity undertaken by those who consider themselves ill, for the purpose of getting well" (Kasl, 1966, p. 246). One of the "rights" of an individual who has assumed sick role behavior is to be excused from social roles or obligations, which would include work. Findings also showed that younger subjects and high risk subjects showed increased absenteeism after screening. A very interesting finding in the Charlson study was that newly labelled individuals who received active follow-up and <u>treatment</u> with antihypertensive medication had minimal increases in absenteeism. In contrast those subjects who received active follow-up but <u>no</u> medication or those who received sporadic follow-up had significantly greater increases in absenteeism. This would lead one to hypothesize that newly diagnosed hypertensive individuals might feel he/she was "getting better" if a medication was prescribed. Charlson concluded by stating that caution should be used when labeling an individual as hypertensive, especially if no antihypertensive medication is given to the person.

In contrast, Haynes, Sackett, Taylor, Gibson and Johnson (1978) showed that labeling of an individual as hypertensive did increase absenteeism, but initiation of therapy for a newly diagnosed hypertensive individual did not effect absenteeism. Two hundred eight men participated in the study. The unaware group (those who had never been told they had hypertension) consisted of 138 men and 70 men were in the aware group. As in the Charlson study, findings in the Haynes study showed that aware participants had twice as much absenteeism as the unaware group before screening, and in the year after the screening, the previously unaware subjects tripled their absenteeism rate, while the aware group showed only a small non-significant rise in absenteeism rate.

The Haynes group initiated a program to promote compliance which included education about hypertension, increased supervision, and home blood pressure monitoring. Findings showed that neither the initiation of therapy or the instructional program influenced absenteeism rates. Haynes suggested that based on the study's findings, discretion should be used when labeling individuals as hypertensive and that detection should only be carried out in settings where therapy and follow-up can be done.

Alderman and Miller (1978) found that access to therapy and follow-up did not affect hypertensive individuals' adherence to therapeutic regimens or their blood pressure control.

Alderman and Miller compared a group of workers who received their health care at a union health center with workers who received their care at the work site. A total of 952 subjects participated in the study. Alderman and Miller concluded that success can be obtained when using a systematic approach to treating a large population group. These researchers found that accessibility to care was not the factor responsible for improved blood pressure control but, rather, the workers' social cohesion and the health-care team concept. The researchers did believe that on-site treatment centers were valuable for hypertensive employees.

Finally, McInnes and MacDonald (1981) stated that occupational health-care providers are in a unique position to identify hypertensive patients, detect risk factors and assist in the treatment and management of hypertensive workers.

The researchers believed that health-care providers would watch for side effects of medications realizing that some side effects could endanger a person who was working with machinery or in high places. The nurse could improve adherence by tailoring therapy to meet job requirements, administering doses to coincide with shift-working, decrease the number of drugs, and simplify drug regimens.

Although the present study is assessing the perceived job barriers to following regimens and not the effect of the regimen on the hypertensive individual's job, these studies

have implications for future job barriers. If an individual misses work frequently, suffers from side effects or is inconvenienced by his/her health regimen, the job may become difficult to perform, thus producing job barriers.

In summary, there is no literature that discusses the effects of job barriers on following a therapeutic regimen. Health-care providers must be aware of the effects of health regimens on job performance and the potential these effects have on producing job barriers.

In the next section, nursing interventions will be discussed.

Nursing Interventions

Nurses play an important role in helping hypertensive patients follow recommended pharmacological and nonpharmacological methods for controlling hypertension (Heine, 1981). The report of the 1984 Joint National Committee on Detection, Evaluation and Treatment of High Blood Pressure states that as soon as the diagnosis of essential hypertension is made, patients and health-care professionals must work together to control hypertension. As stated in this report, one role nurses should assume is to identify adherence problems, suggest solutions, educate patients and monitor progress toward normal blood pressure.

Heine (1981) states that nurses have demonstrated their

effectiveness in working with hypertensive individuals in a variety of settings including community health projects, public health clinics, and hypertension programs. Heine reports there are several ways nurses can assist an individual to learn to cope with their self-care deficit (Orem, 1980). One strategy is to develop a therapeutic alliance by establishing good rapport with open communication. Another strategy is guidance whereby the nurse assists the patient in making decisions and learning skills appropriate for therapy. Involving the family in counseling and education and teaching the patient and family about misconceptions associated with the disease including the asymptomatic nature of hypertension, the need for continuing therapy and the self-monitoring of blood pressure is a final method.

Dunbar (1980) reviewed studies that utilized several behavioral strategies that can be used by nurses to assist patients with their health regimens. Reminders, tailoring, contracting, self-monitoring, reinforcement, and family and peer support were various suggested strategies. Dunbar reported that the effect of using these strategies was not dramatic in most studies, but that each strategy did improve patients' adherence to health regimens. Dunbar, et al. (1979) felt that individualized programs were most useful in helping patients adhere to regimens.

Harper (1984) applied Orem's constructs to self-care

medication behavior of 60 volunteer black, elderly, hypertensive women. Harper's hypothesis was that women who participated in a medication self-care program compared with women who participated in a teaching program about hypertension would have higher scores on a test about medications, fewer medication errors and lower systolic and diastolic blood pressures. All participants had problems with taking medications. The patients were randomly assigned to one of two treatment programs: the medication self-care program (n = 30) or the teaching program about hypertension (n = 30). Patients in the self-care program received four interventions about the purpose, side effects, dosage, schedule and safety factors concerning medications. Patients in the teaching program received four interventions about hypertension. The self-care groups initially show an increased knowledge base concerning medications, perceived control over their health and self-care behaviors as compared to the control group, but this knowledge decreased over time. One possible reason was the program's positive behavioral approach motivated people to learn and practice self-care behaviors.

Similar results were reported in a study by Wilbur and Barrow (1969) in a Georgia community. Two hundred twenty individuals diagnosed with hypertension participated in this study. Participants assigned themselves to groups that would or would not receive visits from a Public Health Nurse at

regular intervals. The Public Health Nurse monitored blood pressure, encouraged medical follow-up and adherence to medications. This experimental group received reinforcement for two years. Hypertension control increased from 15% to 80% in the experimental group. Two years after the visits stopped, hypertension control in the experimental group dropped to 29%. It was hypothesized that long-term supervision was the reason the nursing intervention was effective. Wilbur and Barrow concluded that any successful program for high blood pressure control must be life-long.

Daniels and Kochar (1980) reported their experience in a joint practice relationship with a nationally recognized community hypertension control program, an inner city hypertension clinic, and a work-site hypertension control program. These researchers believed monitoring and facilitating adherence to therapeutic regimens were the responsibility of the professional nurse. These researchers also stressed the importance of the therapeutic relationship when working with hypertensive patients. The individuals' lifestyle, perception of hypertension, side effects, satisfaction with the program and past adherence to therapeutic regimens were assessed. Therapeutic regimens were individualized to each patient and included medication review, positive and negative feedback concerning blood pressure levels, and determining patients' satisfaction with the clinic. Services were designed to provide an outreach

system for patients who missed appointments, decrease waiting time, reduce expense for medications as possible and provide clear instructions concerning side effects.

A study by Jeffrey, et al. (1983) was done to compare the effectiveness of group and individual counseling on overweight men with labile hypertension. Ninety-three males participated in a 20-week dietary intervention program aimed at a 10% body weight reduction and a sodium intake of 70 mEq each day. The study was conducted over two years. The participants were randomly assigned to a group who received written handouts about weight reduction or written handouts about sodium restriction. At the end of the study, both groups had significant reductions in blood pressure, weight, and sodium excretion. Changes in knowledge concerning weight control and sodium restriction were also significant for both groups. The researchers concluded by stating that both strategies were successful in the short term, but that maintenance or behavior change on a long-term basis remains a challenge.

A study by Caplan, et al. (1976) was designed to determine if patient education and social support provided by nurse clinicians would improve adherence for 70 hypertensive adults. The volunteers were assigned to either a control group who received "usual care"; a lecture group; or a social support group. The lecture group received four weekly one-hour lectures on the physiology of hypertension and treatment. The social

support group received six, two-hour weekly sessions which provided factual information and support to improve patients' adherence and motivation. After eight weeks, systolic and diastolic pressures had improved in the lecture and social support group compared to the control group.

In contrast, a study by Webb (1980) concerning the effectiveness of patient education and psychosocial counseling to promote adherence among hypertensive patients showed no effectiveness due to interventions by nurses. One hundred twenty-three participants were randomly assigned to one of three intervention groups: group patient education and regular physician visits (n = 37); individual psychosocial counseling and regular physician visits (n = 31); or only regular physician visits (n = 55). The unequal group sizes did not produce a bias, t-tests between group means showed no significant differences (p = .1). The education intervention included three group education sessions one month apart. The focus of these sessions were causes of hypertension, importance of compliance, etc. The participants were actively involved in group discussion and group decision-making. The counseling intervention included three individual sessions focusing on problems identified by the patient. Webb reported that neither intervention improved patient adherence or blood pressure. This researcher would question the interventions; if individualized to specific patient problems would the outcome be increased adherence?

Tagliacozzo, Luskin, Lash and Kenji (1974) reported on the effects of nurse intervention on patients' adherence to therapeutic regimens. One hundred ninety-two patients with hypertension and/or diabetes participated in the study. Patients were randomly assigned to an experimental group who received four teaching sessions or a control group who did not receive sessions. The results showed that though there were increases in patients' understanding of their illnesses, the nurse intervention did not influence patients' attitudes toward seriousness of the illness. Higher rates of compliance were seen in patients who were more knowledgeable of their disease, had higher education, income, and felt favorable toward the clinic.

Glanz and Kirscht (1981) analyzed data from a longitudinal study of 432 hypertensive individuals to determine how patients react to educational interventions and how their reactions are related to changes in their adherence. Patients were randomly assigned to four sequential intervention experiments. These interventions were written messages, nurse's phone calls, self-monitoring and social support. Findings showed that participants recalled the interventions they were exposed to several weeks after the exposure. The participants also found the interventions interesting, important, and reassuring. Again, the interventions had some effect on behavior, but the effect was short-term.

Foster and Kousch (1981) reported that several strategies had proven successful in improving adherence for the time the patients were exposed to the interventions. These researchers reported that changes in the delivery of health services (reduced waiting time, postcard reminders), communication techniques (feedback, reinforcement, explanation), behavioral strategies (contracting, home blood pressure monitoring, using diaries), contributed to improvement in adherence either used alone or in combination (Finnerty, 1973; Foster, 1978; Sackett, et al., 1976; Stamler, et al., 1975; Steckel, et al., 1977).

Foster and Kousch (1981) offered specific strategies to promote adherence when patients identify barriers to following regimens. Pill taking or appointment keeping strategies were appropriate when identified barriers were "environmental," for instance, busy work schedules, transportation problems. Developing a therapeutic relationship with the patient was especially important when perceived barriers were side effects of medications or dietary regimens. Strategies for good communication between provider and patient were important when the patients' health beliefs were in conflict with the provider's beliefs. Finally, the researchers reported that in situations where the patient is resistant to all strategies, support, periodic contact and a positive attitude toward the patient were the most effective strategies.

Logan, Milne, Achber, Campbell and Haynes (1979) addressed

the problem of adherence when access to care was a barrier. Work-site care provided by nurses was compared to regular family physician care in a randomized controlled study. Four hundred fifty-seven volunteers participated in the study. Subjects were randomly grouped to receive their care from a nurse during work hours or from a physician outside work time. More work site volunteers were prescribed antihypertensive medications (94.7%) and reached their goal in six months (48.5%). Adherence was measured by pill counts and stated compliance and more work site subjects were adherent (67.6%) as compared to offsite subjects (49.1%). The researchers stated these improved outcomes were due to access and who delivered the care.

As has been noted in several studies, nursing interventions do promote increased adherence for a short term. The Working Group to Define Critical Patient Behaviors in High Blood Pressure Control defined behaviors critical to hypertensive subjects' achieving therapeutic control and assuming active responsibility for their own care. This group focused on the "achievement and maintenance of long-term control through drug therapy and concentrated on the patient-physician interaction as a critical factor." The objectives of the group were to define the subjects' knowledge base, subjects' attitudes and skills necessary to control hypertension over a lifetime.

The four patient behaviors that were defined as critical

to achievement of long-term blood pressure control were: (1) make the decision to control their blood pressure; (2) take prescribed medication as scheduled; (3) monitor their progress toward blood pressure control; (4) solve problems that block their achieving normotensive blood pressure levels.

The Working Group further defined a framework in which a nurse can use the nursing process as defined by McCombs, et al. (1980), assessment, planning, intervention, evaluation, to identify hypertensive patients' critical behaviors and work together to achieve blood pressure control.

To summarize, nurses have proven themselves to be effective in delivering health-care services to the millions of people diagnosed with hypertension (Finnerty, 1975; Clark, 1976). There still remain many hypertensive individuals who do not adhere to therapy or who are undetected, thus controlled. It has been shown in literature that nursing interventions are successful in improving adherence for the time the intervention is used. Because nurses have counseling and educative skills, it is important for nurses and patients to define patients' barriers to following health regimens and develop specific interventions to help the individual adhere to life-long therapy.

CHAPTER IV

METHODOLOGY AND PROCEDURE

Overview

This research study was designed to determine what barriers hypertensive subjects perceive in following their therapeutic regimen. The dimensions analyzed were commitment to taking medications, commitment to following recommended dietary measures, and the impact of work on following therapy.

The data for the study were collected as part of a federally-funded research project "Patient Contributions to Care--Link to Process and Outcome." Grant #5R01N000662-01,02,03, B. Given and C. W. Given, co-principal investigators. The project was funded by the Public Health Service, Division of Nursing. The data were collected in 1980-81, using voluntary participants who answered a self-administered questionnaire. Data for this thesis were taken from the Intake Phase of a controlled field experiment before the random assignment of the subjects to control or experimental groups.

A population of hypertensive subjects from four sites within the state of Michigan was used. The instrument was administered to a sample of 158 hypertensive subjects. The study was descriptive in nature and a combination of descriptive

and inferential statistical techniques was used to analyze the data. Descriptive techniques including frequency distributions were done on each item comprising a scale. The internal consistency aspect of reliability was determined for each scale through computation of coefficient alpha. Frequency distributions were done on the sociodemographic data. Finally, correlations among the scales and the sociodemographic measures were determined through Pearson Product Moment correlation.

The purpose of this chapter is to present the methodology and procedures used in this study. The areas to be discussed are sample, setting, instruments, data collection procedures, scoring, procedures for data analysis, and human rights protection.

Sample

The sample selected for this study included consenting hypertensive subjects from four sites in Michigan. To be eligible for the study, subjects had to meet several criteria. Subjects had to: (1) be between the ages of 18 and 65 years; (2) have an established diagnosis of hypertension; (3) be literate; (4) show no evidence of cancer, end stage renal disease, stroke, blindness, psychosis (or be in present treatment for psychiatric problems); (5) not be pregnant or lactating and, (6) be on a prescribed diet or medication regimen for hypertension.

The medical records of the subjects had to include: (1) two elevated blood pressure readings taken at least two months apart. The hypertensive subjects had to have had either a systolic pressure of 140 mm Hg or above or a diastolic pressure of 95 mm Hg or above on these two occasions; (2) name of medication(s), dosage, and the date prescribed and/or type of diet prescribed; and (3) two weight measures taken at least two months apart.

The sample for the study was identified in two ways. In three family practice residency sites, a computer-based automated health information system identified hypertensive subjects who fit the criteria. The method used in the private practice setting was to have four physicians recall appropriate hypertensive subjects. Four hundred and thirty-three hypertensive subjects were originally screened. Of these 433 subjects, 177 were excluded because they didn't fit all the criteria. Based on the screening results, 256 subjects were asked to participate in the study. From these 256 eligible subjects, 158 hypertensive subjects consented and were enrolled in the study.

Setting

The study was conducted at four sites in Michigan. Three of the sites were ambulatory care centers staffed by medical residents training as family physicians. These sites

were located in large cities in central southern Michigan. The three ambulatory care sites were comparable. All had between 18 and 24 family practice resident physicians in training. There were equal number of family practice resident physicians in the first, second and third year programs. Each site averaged 900 to 1200 patient visits per month. The fourth site was two private practice offices shared by four internists. The private offices were located in a large city in southern Michigan and were staffed by four general internists. These internists were all board eligible or board certified in general internal medicine.

Instruments

Two instruments were utilized in this study. One instrument was a questionnaire analyzing subjects' beliefs about hypertension with specific questions assessing subjects' beliefs about taking medications, following a specified diet, and the effect of a job on following recommended regimens. This questionnaire was based on patient beliefs obtained through pre-study interviews and a review of the literature.

The second instrument was a questionnaire designed to gather sociodemographic information about the study participants. The subjects answered questions concerning age, sex, race, marital status, living arrangements, educational status, work status, income, duration of diagnosis of hypertension.

These instruments were developed by B. Given and C. W. Given, the principal co-investigators of the study: Patient Contributions to Care--Link to Process and Outcome.

Development of the Instrument to Measure Subjects' Beliefs About Hypertension

This instrument was developed, tested, and retested on three samples of subjects. These subjects were not part of the sample of subjects whose responses were analyzed in this study.

The instrument was developed to measure subjects' beliefs about: (1) the seriousness of their disease, (2) the efficacy of the therapies prescribed to manage their disease, (3) their personal responsibility for controlling their blood pressure, (4) the benefits and barriers to undertaking and continuing prescribed therapy, and (5) the impact of work on following prescribed therapy (see Appendix A).

Statements were developed from a review of measures of health beliefs and from indepth interviews with 30 people who had hypertension. These hypertensive persons were asked their thoughts about hypertension, the severity of their disease, the efficacy of prescribed therapeutic regimens, and perceived barriers to following therapeutic regimens. From these interviews and review of the literature, scales were formed to measure concepts concerning patients' beliefs about hypertension and therapy.

This instrument was administered to 154 subjects who recorded their responses on a five-point Likert-type scale with responses ranging from "strongly agree" to "strongly disagree." Following the initial analysis, several scales describing subjects' beliefs about the severity of their disease and the efficacy of treatment had relatively low alpha coefficients. Additional items were included and the items used to measure these two beliefs were administered to a second sample of 45 subjects. For the purpose of validation, the entire instrument was administered to a third sample of 97 hypertensive subjects. Scales that had originally been developed to identify beliefs about benefits and beliefs about barriers to taking medications, beliefs about benefits and beliefs about barriers to following diet and beliefs about impact of job on taking medications and following diet did have adequate levels of internal consistency, but the scales were highly interrelated suggesting the scales were covering similar ideas. Thus, the six scales were combined to three scales: beliefs about commitment to diet, beliefs about commitment to medications and impact of job on following therapy (see Table 1).

Sociodemographic Questionnaire

The sociodemographic questionnaire was designed to gather information about variables that may have influenced the

Table 1

Hypothesized and Final Scales for Beliefs About Medications, Beliefs About Diet, Beliefs About Impact of Job on Therapy

Hypothesized Scales	Final Scales Phases I and II
1. Barriers to taking medications	Beliefs about commitment to medications
2. Benefits of taking medications	
3. Barriers to following diet	Beliefs about commitment to diet
4. Benefits of following diet	
5. Impact of job on taking medications	Impact of job on following therapy
6. Impact of job on following diet	

subjects' perception of barriers to following diet recommendations, barriers to taking antihypertensive medications and barriers job may impose to following therapy. This questionnaire was used for gathering data in the research project, "Patient Contributions to Care--Link to Process and Outcome" (see Appendix B). The sociodemographic variables included age, sex, race, marital status, living arrangement, educational status, work status, income, and duration of diagnosis of hypertension.

Data Collection Procedure

Following screening procedures and instrument development 256 hypertensive subjects were eligible for the experimental phase of the study. Letters asking for participation in the study were sent to the 256 subjects (see Appendix C). The letters described the purpose of the study, its potential benefit to the subjects, the length of time of the study, the requirements for participation, a disclaimer that refusal to participate would not affect their care, and that they would remain anonymous and their answers confidential.

Subjects who wished to participate were asked to return a postcard and those wishing more information were given the name and number of a staff member who could answer their questions. This letter was signed by the medical director of each residency center and by the physicians in each of the private practices.

Each subject who returned a postcard expressing interest and all subjects who did not return a postcard were contacted by phone. The study was again described and subjects were asked when it was convenient to meet with the interviewer at the site to complete the questionnaires. From the 256 eligible hypertensive subjects, 158 subjects consented to be a part of the study. At the time of the interview, the study was described again, and upon obtaining the subjects' agreement to participate, the subject was taken to a private room. The interviewer briefly explained the content of the five self-administered instruments, including the one used in this study: the Beliefs about Hypertension Instrument. After obtaining the subjects' written consent (see Appendix D) the subject received the self-administered instruments. The subject was told the interviewer would be available if the subjects had any questions.

The interviewer periodically checked on the subject's progress. After the self-administered forms were completed, the interviewer returned to the room and personally administered the two remaining structured instruments that elicited information about the subject's treatment regimen and symptoms and severity of any symptoms the subject may have had during the two weeks preceding the interview.

Operational Definitions of the Study Variables

Perceived Barriers to Commitment to Diet

Perceived barriers to commitment to diet were the expressed beliefs of the subject concerning the psychological, physical, financial, or other costs to following a recommended diet prescribed by a health-care provider. Barriers to commitment to diet were the perceived problems the subject must have overcome before he/she could follow a prescribed dietary regimen. Perceived barriers to commitment to diet were measured using a subscale of the beliefs about hypertension instrument. The subscale used was the beliefs about commitment to diet subscale. The statements were worded to measure perceptions or beliefs. For example, "I have time to follow the diet prescribed for me." For items included see Appendix A, items 32, 33, 35, 36, 38, 39, 40.

Perceived Barriers to Commitment to Medications

Perceived barriers to commitment to medications were the expressed beliefs of the subject concerning the psychological, physical, financial, or other costs of taking medications to improve control of hypertension. Barriers to commitment were the perceived problems the subject must have overcome before he/she could take the prescribed medications for hypertension. Perceived barriers to commitment to medications

were measured using a subscale of the beliefs about hypertension instrument. The subscale used was beliefs about commitment to medications subscale. This instrument was designed to measure the subjects' beliefs about perceived barriers to taking prescribed antihypertensive medications. The statements in the scale were worded to measure perceptions or beliefs. An example was, "I believe that my medications will control my high blood pressure." For items included see Appendix A, items 22, 23, 24, 25, 26, 28, 29, 30.

Perceived Barriers to Impact of Job on Following Therapy

Perceived barriers concerning the impact of a job on following health regimens were the expressed beliefs of the subject concerning the psychological, physical or other costs the job imposed on following therapy. The barriers were the perceived problems the subject must have overcome before he/she would follow a prescribed regimen. Perceived barriers concerning the impact of job on following therapy were measured using a subscale of the beliefs about hypertension instrument. The subscale used was the impact of job on following therapy subscale. The instrument was designed to measure the subjects' beliefs about the impact of job on efficacy of treatment. The statements in the scale were worded to measure perceptions. For instance, "I worry so much about my job that I can't take my medications." For items included see Appendix A, items 45, 46, 47, 48, 50, 51.

Modifying Variables

Modifying variables are those variables that may influence the results of the study (Polit and Hungler, 1978). Subjects' values are influenced by modifying variables. The value a subject places on performing a recommended health action will be related to a subject's beliefs about his/her health state. Age, sex, race, and socioeconomic status affect subject's exposure to certain experiences and learning, thus formulating and influencing health beliefs. The satisfaction or stresses that evolve with certain role obligations like marital status or work obligations may also influence health beliefs. Data were collected on variables which could affect the study questions. These variables included age, sex, marital status, race, living arrangement, educational status, work status, income, and duration of diagnosis of hypertension. This information was obtained using the sociodemographic questionnaire (see Appendix B). Other modifying variables which would affect study questions were systolic blood pressure, diastolic blood pressure and weight. Information concerning these variables were obtained from the subjects' charts.

Reliability of the Instrument

If repeated use of an instrument under similar conditions gives similar results, the instrument is considered reliable. The reliability of an instrument is the degree

of consistency with which it measures the attribute it is supposed to be measuring (Polit and Hungler, 1978). The higher the degree of consistency, the greater the reliability of the instrument. Reliability can be assessed by addressing the stability, consistency, and dependability of an instrument.

An instrument is said to be internally consistent to the extent that all of the subparts (in this study beliefs about diet, medications and impact of job on therapy) are measuring the same characteristics (commitment to diet, commitment to medications, impact of job on therapy). A high degree of interrelatedness among the subparts indicates a high degree of internal consistency. Two techniques used to evaluate internal consistency are the split half reliability method and coefficient alpha (or Cronbach's Method as it is also called). The measure used in this study to determine the internal consistency of the subscales in the beliefs about hypertension scale was coefficient alpha. The reliability coefficient for the beliefs about commitment to medication subscale was .79. The reliability coefficient for the beliefs about commitment to diet subscale was .69, and the reliability coefficient for the impact of job on following therapy was .91. These values all represent an adequate level of internal consistency.

Validity of the Instrument

Validity refers to the "degree to which an instrument measures what it is supposed to be measuring" (Polit and Hungler, 1978), and can be difficult to establish. Problems of validity relate to the question, "Are we really measuring the attribute we think we are measuring?" (Polit and Hungler, 1978). The types of validity most important to this study are content and construct validity.

Content validity is concerned with the sampling adequacy of the content area being measured (Polit and Hungler, 1978). Objective methods for assessing adequate content coverage of an instrument are hard to find. Subjective methods, experts' analyses of the items used in the instrument, and the researcher's good judgment to carefully plan the items to be used in the instrument are ways to insure content validity. Content validity can be assessed by examining methods used to develop the questions in the instrument. The beliefs about hypertension instrument was developed from interviews with hypertensive subjects, from an extensive review of the literature, by pretesting the instrument, and from the experience of the co-principal investigators.

Construct validity concerns the attribute being measured. The researcher is concerned with the question, What is the instrument really measuring? and is the concept (in this case, beliefs) being adequately measured using this instrument?

The co-principal investigators evaluated construct validity of the beliefs about hypertension instrument by using factor analysis with varimax rotation.

Scoring

Data comprising the sociodemographic instrument included information about the age, sex, race, marital status, living arrangements, educational status, work status, income, and duration of diagnosis of hypertension of the participants. Subjects selected the most appropriate response. The response was scored by the corresponding number to each response. Age was recorded and scored as a continuous variable. Questions are noted in Appendix B.

The subscales used to measure perceived barriers to diet and medications, and the subscale that measured perceived impact of job on efficacy of treatment were scored using a Likert five-point response. Statements were balanced in terms of positive and negative wording and responses were recorded on a five-point scale that ranged from (1) strongly agree; (2) agree; (3) undecided; (4) disagree; (5) strongly disagree. Each belief in each subscale was scored individually. A low score of one or two on a negatively worded statement would indicate the subject perceived the belief as a barrier. An example of a negatively worded statement was, I am confused by all the medication the doctor has given me. A high score

of four or five on a positively worded statement would indicate the subject perceived that belief as a barrier. An example of a positively worded statement was, I believe my medications will control my high blood pressure. Scores for each belief were analyzed to determine how many subjects perceived the belief as a barrier.

Procedure for Data Analysis

Both descriptive and inferential statistical techniques were used in this study. Descriptive techniques used in this study were frequency distributions including percentages, means, and standard deviation. They were used to describe the potential modifying variables and to describe the score responses on the barrier to diet subscale, barrier to medication subscale and the impact of job on efficacy of treatment subscale and to answer the research questions posited. The inferential statistical technique used in this study was the Pearson Product Moment Correlation. This correlation was used to determine if a relationship existed between the modifying variables and the study variables. By determining a correlation between the variables, it could be determined if and to what degree the modifying variables affected the subjects' perception of barriers.

The minimal level of significance which was acceptable in this study was to the .05 level.

Human Rights Protection

All subjects were informed about the purpose of the study, the procedures for collecting the data, and the confidentially of the participants and the results. All subjects were informed that they had the right to refuse to participate, that they had the right to withdraw at any time, and if they did not participate in the study, their care would not be affected. Written consent was obtained from the subjects.

Summary

The purpose of Chapter IV was to present the methodology and procedures used in this descriptive study analyzing subjects' perceived barriers to following a prescribed diet, barriers to taking prescribed antihypertensive medication, and the impact of a job on following prescribed regimens. Areas discussed were sample, setting, instruments, data collection procedures, scoring procedures for data analysis, and human rights protection. In Chapter V, the analysis of the data and a discussion of the interpretation of the results will be presented.

CHAPTER V

DATA PRESENTATION AND ANALYSIS

The data presented in this chapter describe the study population and the study population's perceived barriers to following a recommended health regimen for controlling hypertension. Data are also presented to describe the relationship among the study variables and the extraneous variables (modifying variables). Finally, data are presented describing the relationship among the three scales used to assess perceived barriers (barriers to taking medications, barriers to following a diet, job barriers).

A volunteer sample of 158 English-speaking men and women, aged 24 to 65 years comprised the study sample. This population participated in the research project: Patient Contributions to Care--Link to Process and Outcome (Given and Given, 1982).

In this chapter, a description of the findings of the study and data presentation for the following questions are included:

1. What do hypertensive subjects perceive as barriers to following a prescribed diet for controlling hypertension?
2. What do hypertensive subjects perceive as barriers

to taking prescribed medications for controlling hypertension?

3. What do hypertensive subjects perceive as job barriers to following a prescribed diet or taking prescribed medications for controlling hypertension?

Descriptive Findings of the Study Sample

The study population was obtained from three ambulatory care sites and one internal medicine private practice office located in large cities in southern Michigan.

Modifying Factors

As presented in the conceptual model in Chapter II, there are several factors which may modify an individual's health beliefs.

In this study, modifying variables were divided into three groups: demographics, sociopsychological and modifiers specific to hypertensive individuals. In the following section, the study population will be described within the context of these variables.

Demographic Variables

The demographic variables utilized in this study were age, sex, and race:

1. Age. The age of the study population ranged from 24 to 65 years. The mean age of the subjects was

46.8 years (see Table 2).

2. Sex. The distribution of males and females in this study was fairly even with 50.6% (n = 80) women and 48.4% men (n = 78) participating in the study (see Table 2).

3. Race. Race was determined for 156 subjects in the study. One hundred thirty-six (86.6%) subjects were white, 19 (12.1%) subjects were black and 1 subject (0.6%) was Mexican-American (see Table 2).

Sociopsychological Variables

The sociopsychological variables measured in this study were marital status, living arrangement, education, work status, and income.

Marital status. One hundred twenty-four of the subjects (78.5%) were married. The remaining 21.5% of the subjects were single (n = 11, 7.0%), separated (n = 5, 3.2%), divorced (n = 10, 6.3%) or widowed (n = 8, 5.1%). The 1980 U.S. census reports the following percentages of marital status for persons over 18 years: single, 20.3%; married, 65.5%; widowed, 8.0%; and divorced, 6.2% (see Table 2).

The study sample had a lower percentage of single persons in comparison to the general population, but the remaining statistics are similar.

Table 2

Distribution and Percentage of Subjects by Demographic Variables and Modifiers Specific to Hypertension

	Number of Subjects	Percentage
Age	(n = 158)	
24-35	22	13.9
36-45	45	28.5
46-55	53	33.5
56-65	38	24.1
Sex	(n = 158)	
Male	78	49.4
Female	80	50.6
Race	(n = 157)	
White	136	86.6
Black	19	12.1
Mexican-American	1	.6
Other	1	.6
Marital Status	(n = 158)	
Married	124	78.5
Single	11	7.0
Separated	5	3.2
Divorced	10	6.3
Widowed	8	5.1
Living Arrangements	(n = 158)	
Living alone	18	11.4
Living with children	7	4.4
Living with other relatives	6	3.8
Living with spouse and children	80	50.6

Table 2 (Continued)

	Number of Subjects	Percentage
Living Arrangements (Continued)		
Living with spouse	39	24.7
Living with spouse, children, relatives	3	1.9
Living with spouse's relatives	2	1.3
Other living arrangements	3	1.9
Educational Status	(n = 158)	
Completed high school	7	4.4
Junior high school	6	3.8
Some high school	20	12.7
Graduated high school	54	34.2
Technical, business or trade school	7	4.4
Some college	18	11.4
Postgraduate or Professional	16	10.1
Work Status	(n = 158)	
Work at regular job	104	65.8
Unemployed or laid off	10	6.3
Retired	9	5.7
Disabled	5	3.2
Housewife	26	16.6
Other	3	1.9
Income	(n = 158)	
Less than $5,000	4	2.6
$ 5,000 - $10,999	21	13.9
$11,000 - $19,999	31	20.5
$20,000 - $24,999	28	18.5
$25,000 or more	67	44.4

Table 2 (Continued)

	Number of Subjects	Percentage
Duration of Diagnosed Hypertension	(n = 152)	
Less than 2 years	45	29.6
3-5 years	38	25.0
6-8 years	27	17.8
9-11 years	15	9.9
12-14 years	5	3.3
15 years or more	22	14.5
Systolic Blood Pressure	(n = 151)	
108 - 140 mm Hg	56	37.1
141 - 165 mm Hg	64	49.0
166 - 190 mm Hg	17	11.3
191 - 210 mm Hg	4	2.6
Diastolic Blood Pressure	(n = 151)	
70 - 89 mm Hg	22	14.6
90 - 104 mm Hg	103	68.2
105 - 114 mm Hg	23	15.2
115 - 120 mm Hg	3	2.0
Percentage Overweight	(n = 150)	
20% over ideal body weight	101	67.3
Less than 20% over ideal body weight	49	32.7

Living arrangements. One-half of the subjects (50.6%) were married and living with a spouse and children. Married and living with spouse alone was reported by 39 subjects (24.7%). Seven (4.4%) persons reported they were single and lived with children and 18 subjects (11.4%) reported living alone (see Table 2).

Marital status and living arrangement. The marital status and living arrangement of each participant was obtained. Thus, the majority of participants were married and lived with a spouse and children. The distribution of participants by the variables of marital status and living arrangement can be seen in Table 3.

Educational status. The educational status was determined for each participant. Fifty-four subjects (34.2%) graduated high school, 33 (20.9%) participants did not graduate high school while 37 (23.4%) participants went on to receive some college education. This included trade or business school. Thirty-four (21.5%) of the participants were college graduates, postgraduates or professionals (see Table 2).

Work status. The work status of 155 participants was obtained. One hundred four subjects (66.2%) worked at a regular job. Twenty-six (16.5%) were housewives. Ten participants (6.4%) were unemployed or laid off, 9 participants (5.7%) were retired, and 5 (3.2%) participants were disabled (see Table 2).

Table 3

Distribution and Percentage of Subjects by Marital Status and Living Arrangement (n = 158)

Marital Status and Living Arrangement	Number of Subjects	Percentage
Married, living with spouse and children	80	50.6%
Married, living with spouse	39	24.7%
Unmarried, living alone	18	11.4%
Single, living with children	7	4.4%
Unmarried, living with other individuals	6	3.8%
Married, living with spouse, children, other relatives	3	1.9
Married, living with spouse, relatives	3	1.9%
Other living arrangements	2	1.3%
	158	100.00%

Income. The total family income on a yearly basis was obtained from 151 participants. Sixty-seven subjects (44.4%) reported a yearly income of more than $25,000. Four participants (2.6%) earned less than $5,000. Twenty-one participants (13.9%) earned between $5,000 and $10,000/year. Thirty-one participants (20.5%) earned between $11,000 and $19,999 and 28 participants (18.5%) reported yearly incomes between $20,000 and $24,999 (see Table 2).

Modifiers Specific to Hypertension

The modifying variables specific to hypertension that were measured in the present study were the duration of hypertension, systolic blood pressure, diastolic blood pressure, and weight.

Duration of diagnosed hypertension. Data concerning the duration of diagnosed hypertension were obtained from 152 participants. Eighty-three subjects (54.6%) had been diagnosed with hypertension for five years or less. Twenty-seven subjects (17.8%) had been diagnosed with hypertension for 9 to 11 years while 42 subjects had been diagnosed with hypertension greater than 11 years (see Table 2).

Systolic blood pressure. One hundred fifty-one subjects' systolic blood pressures were recorded. Sixty-four subjects (49%) had systolic blood pressures ranging from 141-165 mm Hg,

37.1% (n = 56) of subjects' systolic blood pressure was 108-140 mm Hg and 13.9% (n = 21) of subjects' systolic blood pressure was 166-210 mm Hg (see Table 2).

Diastolic blood pressure. One hundred fifty-one subjects' diastolic blood pressures were recorded. One hundred three subjects' (68.2%) diastolic blood pressures were classified as mild hypertension with ranges from 90-104 mm Hg (1984 Joint National Committee Report). Based on this 1984 Joint Committee Report, 15.2% (n = 23) of the subjects had moderate hypertension (diastolic blood pressure ranging from 105-114 mm Hg), and 2.0% of the subjects had severe hypertension (diastolic blood pressure equal to or greater than 115 mm Hg). Fourteen and six-tenths percent of the sample population had normotensive blood pressures (diastolic blood pressures less than 85 mm Hg) (see Table 2).

Weight. Data covering 150 subjects' body weight were collected. Twice as many subjects (67.3%) were 20% over ideal body weight compared to 32.7% subjects who were normal body weight, less than 20% over ideal body weight (see Table 2).

Summary

The descriptive findings of the study population were presented in the previous section. The descriptors of the study or the modifying variables were presented by demographic

variables, sociopsychologic variables and variables specific to hypertension. The results of the descriptive data indicate that the study population included an even distribution of men and women ranging in age from 24 to 65. The majority of the participants were white, middle-class, married and living with a spouse and/or children. The majority of participants had a high school education and worked at a regular job. Finally, the mean years diagnosed with hypertension was 3.6 years.

Data Presentation for Research Questions

In this section, each research question will be presented with its associated data as well as an explanation of the statistical analyses utilized.

Research Question #1

What do hypertensive subjects perceive as barriers to following a prescribed diet for controlling hypertension?

Perceived barriers to following a prescribed diet. Following are the statistical techniques utilized and the results:

1. **Statistical techniques for obtaining perceived barriers.** To obtain descriptive data regarding perceived barriers to following a prescribed diet, frequency distributions were calculated. Possible response

scores ranged from one to five. For descriptive purposes, the responses "strongly agree" and "agree" were collapsed into an "agree" category and responses "strongly disagree" and "disagree" were collapsed into a "disagree" category. A low score indicated the subject perceived the statement as a barrier. Statements 32, 36, 39, 40 (Appendix A) were positively worded so a high score would indicate the subject perceived the statement as a barrier. Each statement was scored separately. Data are presented as the number of subjects and percentage of subjects who did/did not perceive the statement as a barrier, the mean score of the responses and the standard deviation.

2. The statistical results. The perceived barriers and number of subjects who perceived the statements as barriers to diet are presented in Table 4. The total frequency distribution is presented in Appendix E. Fifty-one subjects (33.1%) believed it was difficult to follow the prescribed diet for controlling hypertension. Thirty-four subjects (22.0%) perceived lack of family support as a barrier. Hunger when following the diet (20.7%) and the prescribed diet interfering with personal life (21.9%) were perceived barriers for 32 subjects. Less than 10% (n = 15)

Table 4

Distribution and Percentage of Subjects by Perceived Barriers to Following a Prescribed Diet for Controlling Hypertension

Belief	Total N	Subjects Who Perceived Belief as Barrier	
		N	Percentage
Following my diet does not interfere with my normal daily activities	155	18	11.6%
I am always hungry when I stick to my diet	155	32	20.7%
I dislike the tastes of foods on my diet	155	19	12.3%
It has been difficult following the diet prescribed for me	154	51	33.1%
I have time to follow the diet the doctor ordered for me	154	15	9.7%
I can count on my family when I need help following my diet	154	34	22.0%
My personal life does not interfere with my diet	153	32	21.9%

of the subjects believed they did not have time to follow the prescribed diet. Thus, perceived barriers included lack of family support, hunger and difficulty making changes in personal life.

Research Question #2

What do hypertensive subjects perceive as barriers to taking prescribed medications for controlling hypertension?

Perceived barriers to taking prescribed medications. Following are the statistical techniques utilized and the results:

1. Statistical techniques for obtaining perceived barriers. To obtain descriptive data regarding perceived barriers to taking prescribed antihypertensive medications, frequency distributions were calculated. Possible response scores ranged from one to five. The response "strongly agree" and "agree" were collapsed into the category "agree," while the responses "strongly disagree" and "disagree" were collapsed in the category "disagree." Statements 28, 29, and 30 (Appendix A) were positively worded so a high score would indicate the subjects perceived the statement as a barrier. A low score would indicate the subjects perceived the statement as a barrier. Data are presented as the number of subjects

responding to each statement, the number and percentage of subjects who did/did not perceive the statements as barriers, the mean score of the responses, and the standard deviation.

2. The statistical results. The perceived barriers to taking medications and the number of subjects who perceived the statements as barriers are presented in Table 5. The total frequency distribution is presented in Appendix F. Thirteen subjects (8.4%) believed they must take medications even if they didn't believe they would get better. Twelve subjects (7.9%) perceived possible dependence on the medications as a barrier. Other perceived barriers included confusion with all the medications prescribed, lack of interest in taking the medications and interference with daily activities. Only one subject (0.7%) perceived change in lifestyle as a barrier. Perceived barriers for this study population included confusion, lack of interest in taking medications and interference with daily activities.

Research Question #3

What do hypertensive subjects perceive as job barriers to following a prescribed diet or taking prescribed medications for controlling hypertension?

Table 5

Distribution and Percentage of Subjects by Perceived Barriers to Taking Prescribed Medications for Controlling Hypertension

Belief	Total N	Subjects Who Perceived Belief as Barrier	
		N	Percentage
I am confused by all the medications the doctor has given me	154	5	3.2%
I would have to change too many habits to take my medications	153	1	.7%
If I take my medications I may become dependent on them	153	12	7.9%
I am not interested in taking my medications regularly	154	4	2.5%
Taking my medications interfere with my normal daily activities	153	7	4.6%
I must take my high blood pressure medications even if I don't think I'm getting better	154	13	8.4%
I believe my medications will control my high blood pressure	153	3	2.0%
Taking medications is something a person must do no matter how hard it is	154	3	1.9%

Perceived job barriers to following antihypertensive regimens. Following are the statistical techniques utilized and the results:

1. Statistical techniques for obtaining perceived barriers. To obtain descriptive data regarding perceived barriers to following therapeutic regimens, frequency distributions were calculated. For descriptive purposes, the "strongly agree" and "agree" responses were collapsed into an "agree" category and the "strongly disagree" and "disagree" responses were collapsed into the "disagree" category. Data are presented as the number of subjects who did/did not perceive the statements as barriers, the mean score of the responses and the standard deviation.

2. The statistical results. The perceived job barriers to following prescribed regimens for controlling hypertension and the number of subjects who perceived the statements as barriers are presented in Table 6. The total frequency distribution is presented in Appendix G. Eleven subjects (9.8%) perceived their work habits as difficult. Eight subjects (7.2%) perceived their job as a barrier to following a diet. Fewer subjects (n = 2, 1.8%) perceived their job as a barrier to taking prescribed medications. Two subjects (1.8%) perceived their worry about

Table 6

Distribution and Percentage of Subjects by Perceived Job Barriers Impacting Efficacy of Treatment for Controlling Hypertension

Belief	Total N	Subjects Who Perceived Belief as Barrier	
		N	Percentage
If I changed jobs, it would be easier to take my medications	112	2	1.8%
I worry so much about my job that I can't take my medications	112	2	1.8%
If I changed jobs, it would be easier to follow my diet	111	8	7.2%
I could control my weight if the pressures of my job weren't so great	113	3	2.7%
It has been difficult to follow the work habits prescribed	112	11	9.8%
My job does not interfere with taking my medications	112	3	2.7%

their job as a barrier to taking their medications. Less than 10% of the subjects perceived any of the statements as barriers to following a prescribed regimen. Although the majority of subjects did not perceive job barriers, subjects did perceive barriers. These barriers to following health regimens included worry about job and the pressure of the job.

In summary, data were presented in this section of Chapter V describing the perceived barriers to following a prescribed diet to control hypertension, taking prescribed medications to control hypertension and the perceived job barriers to following a regimen to control hypertension.

In the next section of Chapter V, the reliability coefficients of the scales and the relationship among the scales will be presented.

Reliability of the Scales

The reliability of the scales was measured through the computation of the coefficient alpha. Coefficient alpha was computed individually for each of the scales: beliefs about commitment to diet, beliefs about commitment to medication, and beliefs about impact of job on therapy.

The reliability coefficient for beliefs about commitment to diet subscale was .81. This alpha coefficient represented

a fairly high degree of internal consistency among the beliefs measured to following a prescribed diet for controlling hypertension. Six items were deleted from the original beliefs about commitment to diet subscale to obtain this reliability coefficient (Appendix A, items 34, 37, 41, 42, 43, 44).

The reliability coefficient for the beliefs about commitment to medications subscale was .75 which represents a fairly high internal consistency among the items measuring perceived barriers to taking medications for controlling hypertension. Three items wre deleted from the original subscale to obtain this alpha coefficient (Appendix A, items 21, 27, 31).

The reliability coefficient for the beliefs about impact of job on therapy was .88 which represents a fairly high internal consistency among the items measuring perceived job barriers to following a prescribed regimen for controlling hypertension. One item was deleted from the original subscale to obtain this alpha coefficient (Appendix A, item 49).

In summary, the alpha coefficients computed to measure the reliability of the subscales in this study were:

Beliefs about commitment to diet	.81
Beliefs about commitment to medications	.75
Beliefs about impact of job on therapy	.88

Relationships Among the Scales

The degree and direction of the relationship among the three scales were calculated by means of Pearson Product Moment Correlation. The correlation (r) between the commitment to medication subscale and commitment to diet subscale was r = .3201 with a significance level of p = .001. The correlation between the commitment to medication subscale and the belief about impact of job on therapy subscale was r = .6450 with a significance level of p = .001. The correlation between the beliefs about commitment to diet subscale and the beliefs about impact of job on therapy subscale was r = .3304 with a significance level of p = .001. These findings indicate there was a significant relationship between the beliefs about commitment to medications subscale and the beliefs about impact of job on therapy subscale. The relationship among the modifying variables and beliefs about barriers to medications, diet, and beliefs about job barriers will be presented in the next section.

Modifying Variables

The degree and direction of the relationships among the modifying variables and the subscales, beliefs about perceived barriers were calculated by means of Pearson Product Moment Correlation including point biserial correlations when the

data were in the form of discrete categories rather than continuous scores. The total correlation matrix can be seen in Table 10. The following are the relationships between the modifying variables and the major study variables:

1. Age. There was a moderate positive relationship between age and beliefs about commitment to diet ($r = .2330$, $p = .002$), indicating the older the individual the fewer the perceived barriers.
2. Sex. There were no significant relationships between sex and the subscales.
3. Race. There were no significant relationships between race and the subscales.
4. Marital status. There were no significant relationships between marital status and the subscales.
5. Living arrangement. There were no significant relationships between living arrangements and the subscales.
6. Educational status. There was a moderate positive relationship between educational status and beliefs about commitment to medications ($r = .2253$, $p = .003$), indicating the higher the educational level, the fewer perceived barriers.
7. Work status. There were no significant relationships between work status and the subscales.

8. Income. There were no significant relationships between income and the subscales.

9. Duration of diagnosed hypertension. There was no significant relationship between duration of hypertension and the subscales.

10. Systolic blood pressure. There was a moderate positive relationship between systolic blood pressure and beliefs about commitment to medications ($r = .1710$, $p = .028$), indicating the higher the systolic blood pressure the fewer perceived barriers. There was also a moderate positive relationship between systolic blood pressure and beliefs about impact of job on efficacy of treatment ($r = .2024$, $p = .023$), indicating the higher the systolic blood pressure the fewer the perceived barriers.

11. Diastolic blood pressure. There were no significant relationships between diastolic blood pressure and the subscales.

12. Weight. There were no significant relationships between weight and the subscales.

In summary, the relationship among the modifying variables and the major study variables of beliefs about diet, beliefs about medications, and beliefs about job were addressed in this section. There was a moderate positive relationship between educational status and beliefs about medications

indicating the more education the fewer the perceived barriers. There was a moderate positive relationship between age and beliefs about diet indicating the older the individual the fewer the perceived barriers. There was also a moderate positive relationship between systolic blood pressure and beliefs about medications and beliefs about impact of job on efficacy of treatment indicating the higher the systolic blood pressure the fewer the perceived barriers. Finally, there were no relationships among the other modifying variables and the major study variables.

Summary

In this chapter, data were presented that described the study sample, the perceived barriers to taking prescribed medications for controlling hypertension, the perceived barriers to following a prescribed diet for controlling hypertension, and the perceived job barriers to following therapeutic regimens. The Pearson Product Moment Correlation was utilized to identify the degree and direction of relationships among the beliefs about perceived barriers. The modifying variables were also correlated with the individual beliefs and the subscales. Reliability analyses were described concerning the subscales utilized in this study.

In Chapter VI, the research study and the data described in Chapter V will be interpreted. Conclusions will be

discussed in relation to the research questions. Limitations of the present study and implications for nursing practice, education and research will be presented.

CHAPTER VI

SUMMARY INTERPRETATIONS AND RECOMMENDATIONS

Introduction

In Chapter VI a summary and interpretation of the research findings are presented. This summary and interpretation will include a description of the study sample, results of the research questions, limitations of the present study, and implications of this for nursing practice, education and research.

Summary and Interpretation

A descriptive study was completed to determine what hypertensive subjects perceive as barriers to following a prescribed diet (weight loss and/or sodium restriction) and taking antihypertensive medications to control hypertension. Perceived job barriers that interfered with subjects' ability to follow the therapeutic regimen were also assessed.

This study consisted of 158 hypertensive subjects who ranged in age from 24 to 65 years. The sample consisted of an even distribution of men and women and included married persons living with either a spouse and/or children. The subjects included persons currently working at a job, homemakers, and a small number of unemployed, retired, or disabled

persons. More than one-half the subjects had a high school education or higher. Duration of diagnosed hypertension for subjects in this study ranged from less than one year to 15 or more years, with the majority of persons having hypertension five years or less.

There was a greater proportion of white subjects than black subjects, but the proportion was similar to that of the general population. Median family income for the sample was higher than for the general population.

Therefore, the study population was composed primarily of white men and women, aged 24 to 65, who worked at regular jobs and lived with a spouse and children. These findings are consistent with statistics of the general population. This sample population is similar to sample populations in other studies that assess perceived barriers to therapeutic regimens (Tuck, et al., 1981; Glanz, et al., 1981).

One instrument was used in this study and was developed based on expectancy value models and Rosenstock's Health Belief Model. One instrument was a questionnaire analyzing subjects' beliefs about hypertension with specific questions assessing subjects' beliefs about taking medications, following a specified diet, and the effect of job on following recommended regimens. This instrument was developed by B. Given and C. W. Given, principal co-investigators of the study: Patient Contributions to Care--Link to Process and Outcome (Appendix A).

A questionnaire designed to gather sociodemographic information about the study participants was also used.

A combination of descriptive and inferential statistical techniques were used to analyze the data. Descriptive techniques were done on each item comprising a scale and reliability of each scale was determined through computation of coefficient alpha. All scales had a moderate to high reliability (Chapter V).

The purpose of the study, as discussed in Chapter I, was to answer the research questions:

1. What do hypertensive subjects perceive as barriers to following a diet for controlling hypertension?
2. What do hypertensive subjects perceive as barriers to taking prescribed antihypertensive medications for controlling hypertension?
3. What do hypertensive subjects perceive as job barriers to following a prescribed diet or taking prescribed antihypertensive medications for controlling hypertension?

In the following section, the relationship of sociodemographic variables or modifying variables to the major study variables will be discussed.

Modifying Variables

As discussed in the literature review, proponents of the Health Belief Model believe that an individual's perception of barriers to aspects of prescribed therapy affect the likelihood of following a recommended health action (Becker, 1974; Kirscht, 1974). Modifying variables or sociodemographic variables may also affect an individual's perceptions of barriers to care. For a hypertensive individual, age, sex, race, education, marital status, income, work status, living arrangement, and duration of hypertension may affect perceptions of barriers to following therapeutic regimens (see conceptual framework).

A Pearson Product Moment Correlation was performed to determine relationships among the modifying variables and the major study variables of barriers to medications, barriers to diet, and job barriers (Table 10, Appendix H). Significant relationships were not found between sex, race, marital status, living arrangement, work status, income, and duration of hypertension.

A positive relationship, albeit moderate, was found, between educational status and beliefs about medications, indicating the more education an individual has, the fewer perceived barriers to taking medications. This is consistent with studies which show correlation between educational level and compliance with medical regimens (Caldwell, et al., 1970;

Kirscht and Rosenstock, 1977). However, this is contrary to the findings of other researchers who found no correlation between educational status and compliance with medical regimens (Greene, et al., 1982). This researcher hypothesized that it was possible that the more education an individual had, the more the perceived barriers to taking medications. Individuals with more education may be cognizant of the possible side effects of medications and the lifelong commitment to taking medications, thus perceiving more barriers.

Individuals with more education may also be aware of non-pharmacologic measures for controlling blood pressure; diet and exercise may be viewed as less intrusive and may be a part of their lifestyle. The feeling of dependence on medications also may be viewed as a barrier. Thus, health care providers must include an assessment of the individual's beliefs, sociodemographic status including educational level and lifestyle. The individual should be an active participant in establishing a program for controlling hypertension and the programs should be tailored to fit the individual's lifestyle.

This researcher believed that although some conclusions concerning perceptions of barriers to care and the effects of modifying variables may be drawn, it is ill-advised to make generalizations concerning the sociodemographic variables of an individual and his/her perceived barriers to care.

In combining the results of several studies, one may draw false conclusions because studies that have determined perceived barriers to care have analyzed different medical conditions, patient populations, used varying research designs, ways of gathering data methods and outcome measures. The information obtained from these studies may provide useful data to identify individuals who may perceive more barriers, but the findings do not help to account for the many individuals who have one or more of the characteristics and do not perceive barriers to care. Therefore, sociodemographic or modifying variables may be called "risk factors." Health care providers may use these modifying variables as an aid for identifying persons who will potentially perceive barriers, but these modifying variables should not be used to categorize persons as perceiving greater barriers to care. Clinical Nurse Specialists (CNS) must be aware of the modifying variables that can affect an individual's ability to follow a therapeutic regimen. Most importantly, the CNS must explore with the individual modifying variables the <u>individual</u> believes may put him/her "at risk" for noncompliance.

In summary, there was a moderate positive relationship between education and perceived barriers to medications indicating the more education the fewer perceived barriers. There were no significant relationships between the modifying variables of sex, race, marital status, income, work status, living

arrangement, and duration of hypertension and the major study variables. In the next section, the major study variables and research findings will be discussed.

Research Questions

1. What do hypertensive subjects perceive as barriers to following a diet for controlling hypertension?

Descriptive statistical techniques were used to determine what barriers subjects perceived to following a diet for controlling hypertension. A percentage ranging from 9.7 to 33.1 of the subjects perceived barriers to following a specified diet, but the majority of study participants did not perceive barriers to following a prescribed diet.

Researchers have shown that it is more difficult to adhere to a dietary regimen than taking medications for controlling hypertension (Glanz, 1980). Glanz reported that dietary regimens are often restrictive rather than additive. Medication regimens often require changes in lifestyle and are of long or permanent duration. This researcher also anticipated that lack of social support, cost of food, and the taste of low sodium foods would be identified as barriers. However, this was not found in this study. It was anticipated that the majority of subjects would perceive barriers, thus, the finding of low perceived barriers to following a diet was an unexpected one.

There are several possible explanations for this finding. Some explanations may be related to the modifying variables of the study sample. The age range for people in this study was 41 years (range 24 to 65 years). The broad range of 41 years could account for differences in the subjects' perceptions of barriers.

The marital status and living arrangements could also influence subjects' perceptions and account for the low percentage of perceived barriers. Caldwell, et al. (1983) found that hypertensive patients who were unmarried had poor blood pressure control. The majority of the participants in this study were married and living with a spouse and children. Seventy-eight percent felt they could count on their family when they needed help following the diet.

Another possible explanation could be that individuals are becoming more aware through the media of the importance of low sodium foods. Family journals, magazines, diet and exercise journals, and newspapers all have articles on the value of low sodium foods and no added salt diets. Persons may be decreasing their sodium intake for reasons unrelated to their hypertension; peer pressure or social desirability. As individuals become more aware of their sodium intake, they may find more creative ways to prepare their foods and make food preparation a part of their daily activities. These possibilities would substantiate the findings that only 19

subjects (12.3%) disliked the tastes of their foods, that 15 subjects (9.7%) did not have time to follow the prescribed diets and that 155 subjects believed following the diet recommended to them did not interfere with daily activities.

Research findings indicate that longer duration of a disease and adherence to a regimen are negatively associated (Becker, et al., 1977; Glanz, 1980). Findings indicate that the longer an individual has been diagnosed with hypertension the more perceived barriers to following a therapeutic diet. The majority of subjects (54.6%) had been diagnosed with hypertension five years or less and perceived fewer barriers to diet, thus supporting previous findings.

At this point, it might be hypothesized that the subjects perceived few barriers to following a diet because they had no difficulty. If this were the case, blood pressure and weight should be within normal limits. One hundred one subjects (67.3%) were more than 20% overweight. Systolic blood pressures ranged from 108-210 mm Hg with a mean of 149.3 mm Hg. Diastolic blood pressures ranged from 60 to 120 mm Hg with a mean of 96.7 mm Hg. As discussed in the literature review, high normal blood pressure should be 140/90 and individuals should be within normal limits for weight (High Blood Pressure Detection and Follow-Up, 1984). Therefore, the scale used to assess perceived barriers to care may not have tapped the barriers to diet perceived by this sample population. The subjects

may not have been following their diet and the barriers may not have been real to them. Another possibility, though, could be the subjects did perceive themselves as following their diet (thus perceiving few barriers), but did not take medications, did not exercise, and continued to follow poor health practices (smoke, alcohol intake), which could account for elevated blood pressure. It is also possible that the individuals in this study were not following a prescribed diet for hypertension control. One criteria for inclusion in the study was following a diet for controlling hypertension and/or taking antihypertensive medications. This researcher did not determine what diets individuals were prescribed or if they did follow their diets. Thus, it is possible that individuals were <u>not</u> prescribed diets or did not follow dietary regimens. If so, then it would be logical that individuals would not perceive barriers to recommended dietary regimens.

A final possibility is that data concerning perceived barriers were collected from a group of individuals diagnosed with hypertension and being seen by a physician. These people were in no educational or counseling programs to identify barriers and/or assist with increasing adherence. Because there were no "incentives" to lose weight or decrease blood pressure; for instance, weekly monitoring, home blood pressure testing, small group counseling, the subjects did not perceive a need to follow a diet; again, the outcome would be few

perceived barriers to care. If subjects were in educational or counseling groups and the outcome was weight loss and/or blood pressure reduction, it is possible more barriers would be identified.

Nursing Implications

The rank order of perceived barriers was presented in Table 4. Fifty-one subjects (33.1%) perceived their recommended diet as being difficult to follow. Identified barriers for the difficulty in following recommended diets were lack of family support (n = 34, 22.0%), personal life interfering with diet (n = 32, 21.9%), although only 18 subjects (11.6%) believed that following their diet interfered with normal daily activities and hunger when following the recommended diet (n = 32, 20.7%) was a barrier.

Nurses, especially those in advanced practice can assist individuals to follow recommended diets for controlling hypertension. Nurses can meet with patients on an individual basis for assessment and patient education. At the initial visit, a nutritional assessment including a dietary history, food habits, and exercise habits would be done. The individual's lifestyle, family history, and medical history would also be assessed at this time. The patient would be educated about the basics of the prescribed diet and barriers to following the diet as perceived by the patient would be discussed.

Simple recommendations or diet diaries may decrease the feeling of being overwhelmed. At the next visit, the nurse and patient may want to include a significant other or the person involved in food preparation. At this time, a plan based on the individual's lifestyle, capabilities and the mutually established outcomes would be developed.

The patient may be given food lists or booklets to assist in understanding dietary habits. Evaluation of progress and of patient's understanding of the regimen should be done. Perceived barriers would be reassessed because the patient may perceive different barriers as therapy is initiated. Depending on the patient's lifestyle and needs, the nurse may take on the role of counselor, resource person, or support person. Different techniques to improve adherence to a diet may include tailoring the dietary regimen to fit the person's lifestyle, contracting with the individual, group sessions or individual refresher courses (Heine, 1981).

2. What do hypertensive subjects perceive as barriers to taking prescribed antihypertensive medications for controlling hypertension?

Many studies have been done to assess hypertensive individuals' perceived barriers to following therapeutic regimens. Cummings, et al. (1982) found hypertensive patients' perceived lack of interest (4.7%), and dependence on the medications

(2.3%) as barriers to taking medications. Kirscht and Rosenstock (1977) found that individuals who had difficulty following physician's advice had difficulty adhering to health regimens. Finally, Caldwell, et al. (1970) found hypertensive patients perceived poor instruction (36.0%) and discouragement (7.0%) as barriers to continuing treatment.

Because so many hypertensive patients have difficulty following antihypertensive medication regimens, this researcher anticipated that more subjects would perceive barriers. Yet, the percentage of patients who perceived "lack of interest," as a barrier was similar in this study and the Cummings' study. It is very difficult to make comparisons between studies because the perceived outcomes vary with each study. Adherence to antihypertensive regimens has been measured by blood pressure, pill counts, prescription refills, and appointment keeping. Adherence has also been measured on Likert-type scales where the subjects choose always to take medications, sometimes to take medications, never to take medications. This wide variety of definitions makes assessing specific barriers to taking antihypertensive medications difficult.

In the present study, there are several possible reasons why few subjects perceived barriers.

The sociodemographic variables may have affected the perception of barriers. It has been shown in reseach studies that the very young and the very old are more likely to perceive

barriers to care (Gillum, et al., 1979; Blackwell, 1973). The age range of the sample in this study was 24 to 65, with no very young or very old participating in the study.

There was a moderate positive relationship between educational status and beliefs about medications ($r = .2253$, $p = .003$) in the present study; the higher the educational status the fewer the perceived barriers. Almost half the subjects (43.9%) had at least some college education while 54 subjects (34.2%) had a high school education. These findings support the results that few barriers were perceived in this study.

Results of research studies have indicated that persons who are unmarried are less likely to follow therapeutic regimens (Gillum, et al., 1979). In the present study, 124 subjects (78.5%) were married. These subjects may perceive their spouses as being supportive and knowledgeable about the therapeutic regimen. The spouse may help decrease the confusion and disinterest a hypertensive subject will feel when adhering to lifelong therapy. A spouse may also help to incorporate medication regimens into the hypertensive subject's daily routine.

An interesting finding in the present study was that 13 subjects (8.4%) felt they must take their antihypertensive medications even if they did not feel they were getting better. The symptoms of hypertension are often asymptomatic and studies have shown that patients often stop taking their medications because they "feel fine" (Caldwell, et al., 1970). It would

be interesting to know why these people didn't feel they were getting better; was their blood pressure elevated, were they not taking their medications regularly or, because they were told they had to continue medications did they perceive they were not getting better? These subjects may benefit from a refresher course about hypertension and the rationale for therapy.

Another possible reason few subjects' perceived barriers to taking medications is that subjects were attuned to their health status and realized that taking medications for blood pressure would improve health and possibly lengthen lifespan. The majority of subjects were professionals with some college education. These subjects may be more "health conscious" and be aware of regimens for controlling hypertension.

Hypertension is a major health problem in the United States and more individuals are becoming aware of this fact. Many articles have been published discussing the physiology of hypertension and methods of treatment. More people are being diagnosed with hypertension due in part to better screening and detection programs (1984 Report of the Joint National Committee). Hypertensive individuals may find it "easier" to follow medication regimens because they know friends or relatives with hypertension. The sample population may find other individuals with hypertension are support persons.

The criteria for inclusion in this study included taking

at least one antihypertensive medication. Data were not gathered by this researcher concerning how many medications individual subjects were taking. Some medications for controlling blood pressure can be taken once each day. It is possible subjects did not perceive confusion concerning their medications because they were only taking one medication daily. Persons may also feel their antihypertensive regimen does not interfere with their lifestyle because their regimen consists of one medication daily.

Another possible reason few barriers were perceived is that subjects in the present study did not consistently take their medications as directed. A subject may take his/her medications "most of the time," feel no adverse effects and believe he/she is adhering to the regimen. If an individual believes he/she can take medications fairly regularly and maintain blood pressure control, they are not likely to believe their medications interfere with their lifestyle or that they have to change too many habits to take medications.

Finally, the sample participants' perceived barriers were measured at one point in time. It is possible subjects were feeling confused or disinterested the day data were collected for the study. It is also possible the subscale did not tap the barriers to medications perceived by the study sample. There were no items to measure perceived barriers due to cost, side effects, or physician-patient relationship.

Nursing Implications

Descriptive statistical techniques were used to determine what barriers subjects perceived to taking prescribed antihypertensive medications to control hypertension. Results of the analysis showed that 13 subjects felt they must take their antihypertensive medications even if they felt they were not getting better. Twelve subjects (7.9%) perceived dependence on the medications as a barrier. Seven subjects (4.6%) perceived disruption in lifestyle as a barrier while five subjects (3.2%) perceived confusion about medications as a barrier. Four subjects (2.5%) were not interested in taking the medications on a regular basis. Only three subjects (2.0%) did not believe their medications would control their blood pressure.

Inability to take antihypertensive medications on a regular basis has been recognized as a major problem in the control of hypertension. The nurse in an advanced practice role is in a key position to elicit the individual's perceptions about hypertension and assist the individual to develop appropriate beliefs about hypertension and the treatment regimen. The nurse must assess the individual's needs, status, and priorities and answer the questions: "How willing is the patient to begin treatment?" "What does the patient expect from treatment?" or "What is a realistic goal for the patient?"

The nurse should assess the patient's beliefs concerning

medications. Educational strategies including lecture/discussion format, group sessions, self-instructional materials, and handouts will provide the patient with appropriate information which may decrease perceived dependence or confusion about medications (Heine, 1981).

A treatment regimen must be based on mutual agreement and responsibilities between the patient and the health care provider. The mutual goal should be a reduction in blood pressure to a normotensive level. Patient responsibilities could include: making the decision to control hypertension, following prescribed therapeutic regimens, and identifying possible barriers to following regimens. The health care provider's responsibilities may include: encouraging the patient to take an active role in his/her care, developing a therapeutic relationship with the patient and assisting the patient to find ways to incorporate the regimen into his/her lifestyle. Methods to incorporate an individualized medication regimen into a patient's lifestyle include: tailoring the regimen, providing cues to take medications, contracting with the patient, gradually implementing the regimen, if possible, teaching the patient to self monitor blood pressure and, finally, reinforcing the patient's progress.

It is important for nurses to assess an individual's support system and involve this system in providing social and emotional support to the patient. Finally, health care

providers should utilize the team approach in assisting the hypertensive patient to follow a medication regimen. Pharmacists, physicians, social workers, and nurses all provide unique services that may benefit a patient at different times.

In summary, hypertensive patients should be included when designing a therapeutic regimen to control hypertension. By assessing patient's beliefs and desired outcomes, an individualized plan can be developed that will help reduce perceived barriers.

3. What do hypertensive subjects perceive as job barriers to following a prescribed diet or taking prescribed medications for controlling hypertension?

Fewer subjects responded to the beliefs in this scale. The number of subjects who responded ranged from 114 to 123 subjects. One hundred four subjects stated they were employed at the time the data were collected and 26 subjects indicated they were housewives. Since more subjects responded to the beliefs than stated they were employed at regular jobs, it can be assumed that housewives believed their occupation was considered a regular job and/or persons who were not currently employed responded to the section regarding job barriers. This may have an effect on the type of barriers perceived by this sample. It may also have an effect of the actual percentage of working persons who perceived the statements as

barriers. This researcher would hypothesize that persons who were retired (5.4%) would not perceive their job as affecting their ability to follow therapeutic regimens. Conversely, it is possible that persons who were unemployed or laid off (6.4%) were so worried about finding a job that they had difficulty taking medication. Few persons perceived barriers, but there are reasons why some people did perceive their job as a barrier to following suggested regimens. Data from studies by Haynes, et al. (1978) and Charlson, et al. (1982) found that labeling an individual "hypertensive" does affect absenteeism from work. Haynes, et al. found that absenteeism was related to the employee's awareness of the diagnosis but was not affected by the institution of therapy or the success in reducing blood pressure. Charlson, et al. found that younger (less than 30) employees were more inclined to miss work after being labeled hypertensive than older (greater than 30) employees. More than one-half (54.6%) of the sample population had been diagnosed with hypertension five years or less. It is possible that the increased absenteeism from work following the individual being labeled hypertensive was now causing problems at work. Individual's job performances may be below acceptable levels due to absenteeism. The employees may have been experiencing greater pressures to improve work or have been told their jobs were in jeopardy. If this is so, it may have been difficult to follow therapeutic regimens for blood

pressure control.

Three subjects did perceive their job as interfering with taking their medications. This is an important finding for persons who prescribe medications. Antihypertensive medications may be taken daily, but depending on the control needed, individuals may have to take combinations of drugs two or three times each day. Many drugs do cause side effects that may affect an individual's ability to perform a job duty.

If an individual's job requires working with machinery or working in high places and the patient is experiencing side effects from the medications, the patient may not be able to perform his/her job. Thus, the individual may believe that changing jobs would make it easier to take medications.

Individuals in the sample population may work shifts that require sleeping through the day or working in the evening. It may be difficult for these individuals to follow low sodium diets because they eat alone or prepare their own meals. It may also be difficult to take medications three times each day with meals. Thus, these individuals may believe that changing jobs would make it easier to take medications (n = 2) and follow a diet (n = 8).

Few respondents perceived the beliefs as job barriers and there are several possible reasons for these findings. One possible reason would be that the individuals' jobs were not causing stress or worry. Almost half of the population

(44.9%) had received some college education or were college graduates. It is likely these individuals were working in a job of their choice. There are stresses with all jobs, but if these individuals were controlling their stresses, it is probable they did not perceive their job as affecting their ability to follow a therapeutic regimen. This is borne out in the analysis of the data which shows that few individuals believed the pressures of the job were too great (n = 3) or that worry about job affected medication regimens (n = 2).

The majority of subjects were married (78.5%) and living with a spouse and children. These individuals would provide support to the hypertensive individual. Many individuals in this study may have used a spouse as a confidant to discuss the pressures and worries of the job situation. The spouse may provide a supportive environment for taking medications and following a diet by preparing low sodium meals and tailoring the patient's medication regimen to his/her lifestyle.

Another reason few individuals perceived these beliefs as barriers would be that they were not taking their medications or following their diets regularly. Because subjects were not having difficulty taking medications or following a diet, does not mean they were adhering to the regimen. It is possible that a job would cause barriers to taking medications if the individual was taking medications as directed. This researcher did not measure individual's level of adherence

to suggested regimens.

A final possibility as to why individuals perceived few job barriers was that the concept of barriers was not tapped. One or two questions were used to assess the concepts of job barriers to taking medication and following a prescribed diet. It is possible these statements did not correctly assess the sample populations' perception of job barriers.

Nursing Implications

Descriptive statistical techniques were used to determine what job barriers hypertensive subjects perceive to following a recommended health regimen for controlling hypertension. No previous research has analyzed this question and thus no findings exist to either support or refute the findings in this study.

Eleven subjects (9.8%) felt that their work habits were difficult to follow. Eight subjects (7.2%) believed it would be easier to follow their recommended diet if they changed jobs and three subjects (2.7%) believed they could control their weight if job pressures weren't so great. Three subjects (2.7%) believed their job interfered with their medication regimen. Two subjects (1.8%) believed it would be easier to take their medications if they changed jobs and two subjects (1.8%) felt they worried so much about their jobs that they could not take their medications. An individual's job or

work status must be considered a possible barrier to following regimens for controlling hypertension based on these findings.

Nurses in advanced practice should include job status in their assessment. Included in this assessment should be data associated with a job that may affect a hypertensive individual's ability or desire to follow a regimen. Type of work (labor or management), working hours (shift work), work conditions (indoors, outdoors, high places, hot, crowded, or noisy work sites, working alone or in groups) and environmental stresses (psychological stress, exposure to chemicals or heavy metals) should be assessed for an individual who perceives job as a barrier.

The hypertensive individual could be taught stress reduction or anticipatory guidance which would reduce worry and job pressures. Labeling an individual as hypertensive should be done when the diagnosis would be accurate. The nurse should educate the individual concerning hypertension using appropriate strategies, but base the diagnosis of hypertension on correct criteria. Once the therapeutic regimen is initiated, health care providers must collaborate to individualize the regimen. Medication and diet scheduling should be based on the individual's type of work, work conditions and work hours. The individual's job should be considered when scheduling follow-up visits.

For patients who believe it would be easier to follow therapeutic regimens if they changed jobs, the nurse should use anticipatory guidance and assist the individual in suitable job placement. Finally, the nurse in advanced practice in collaboration with other health care providers may design work-site programs to monitor hypertensive patients, provide information about hypertension to employers and co-workers, or develop work-site health promotion programs.

Limitations of the Study

In addition to the limitations stated in Chapter I, the following limitations have been identified which may have affected the results of the study.

Data for work status was gathered on the sociodemographic instrument, but this researcher did not determine the main occupation of study participants. The type of job each participant performed may have affected perceived job barriers. This researcher did not gather data for level of career commitment or job satisfaction. These variables may also have affected perceived job barriers.

Data for family yearly income was obtained but this researcher did not correlate income with living arrangement for each subject. This analysis would have been helpful in determining sociodemographic status of the subjects.

There were no measures of adherence in the present study.

There were measures of adherence in the parent study by Given and Given (1982), but this researcher did not measure how often patients believed they took their medications or how well they followed their prescribed diets. These findings may have affected individuals' perceptions of barriers.

There was no measure of social support in the present study. This variable may have had an effect of the subjects' perceptions of barriers related to job and following therapeutic regimens.

Data were not gathered on other types of perceived barriers including side effects, cost of medications and cost of low sodium foods. These beliefs may have been perceived as barriers by the study population.

Implications for Nursing Practice

The implications for nursing practice will be discussed within the context of the nursing process adapted from Orem (1980). Research has shown that individuals who are unable to follow therapeutic regimens perceive barriers to care. There are several types of barriers that affect individuals' abilities to follow regimens and these have been addressed in the present study.

If an individual's perceived barriers prevent him/her from following a therapeutic regimen, then the person is unable to perform optimal self care (Orem, 1984). Individuals

perceive barriers that are unique to them and are influenced by a variety of factors including sociodemographic variables. Health regimens that require an individual to change lifelong habits (for instance, weight reduction, sodium restriction, or taking medications on a daily basis) cannot be initiated and often will not be successful if the individual perceives barriers to following regimens. Thus, the goal of nursing is to help individuals perceive and overcome barriers and perform self care.

In practice, nurses must be aware of the effect of barriers on following a therapeutic regimen. The nurse must value the importance of an individual providing his/her own self care and access the effect of barriers on a person's ability to perform self care activities. Nurses must focus on individuals, and more importantly, the nurse's perspective must encompass the patient's perspective of his/her health situation and perception of barriers.

The nursing process consists of assessment, diagnosis, planning, implementation and evaluation. Using this process, the nurse in advanced practice can practice within the supportive-educative nursing system and provide guidance, support, and education to help individuals identify barriers and assist the individual in learning ways to overcome barriers.

During the assessment phase or diagnosis and prescription phase (Orem, 1984) of the nursing process, the nurse

must help the individual identify barriers that prevent the individual from following regimens designed to improve the health state. The nurse should assess the individual's socio-demographic status and identify "at risk" individuals. The nurse would assess the individual's perception of barriers to medications, diet and job barriers. The assessment tools used in this study could be used for this purpose. The nurse would form her own perceptions of the patient's health state and perceived barriers than share these perceptions with the patient; thus, the two would form a therapeutic relationship and base the goals or outcomes of the relationship on mutually defined problems (Orem, 1980).

During the assessment phase, the nurse must assess the individual's understanding of the term "barrier." It is possible the individual may not perceive barriers and the nurse may use anticipatory guidance to assist the individual in identifying real and potential problems. An individual may not identify barriers before starting a regimen, but once the individual begins treatment or as the regimen becomes more complex, barriers may be identified. This is especially possible when a person is asked to alter dietary patterns that require the individual and family to change lifelong patterns. By assisting the patient to understand the concept of barriers, how barriers can affect adherence to regimens, and how barriers can change over time, the nurse helps the

patient identify potential problems. At this point, a nursing diagnosis should be developed and used to guide nursing interventions.

Based on the findings of this study, nurses should be aware that perceived barriers may include hunger when following a diet, lack of family support, and interference with lifestyle. Nurses should be aware that educational status affects perceived barriers to taking medications. Nurses should also be aware that an individual's job may cause so many stresses that an individual does not have the resources left to follow therapeutic regimens.

Hunger, family support, and how a regimen affects lifestyle are rarely assessed. The nurse in an expanded role must include these aspects in a complete assessment. Thus, the therapeutic regimen will be based on the individual's beliefs and perceptions and individualized to the patient.

Findings from this study indicate that individuals will perceive barriers to care, but the peceived barriers are not necessarily the same barriers the nurse perceives; therefore, the nurse's values or assumptions may not be the same as the patient's values. Thus, it is vital to determine the patient's perception of barriers and base nursing interventions on the patient's perceptions.

In planning and implementation, the nurse and patient design a system of nursing assistance (Orem, 1980), which

includes guidance, support, and education. Together, the nurse and patient mutually agree on priorities and set realistic goals for overcoming barriers. These goals may include providing the patient with information about the various alternatives for treating hypertension and guiding the patient to fit these alternatives into his/her lifestyle. The nurse may instruct the patient on various strategies that could be incorporated into the plan to help patients overcome barriers. These strategies include tailoring, medication recording, pill dispensers, use of community resources, contracting and educating patients about medications, diet, exercise, stress reduction, and smoking and alcohol use.

Nurses should provide support to the patient and family or significant other support systems. Nurses and patients need to understand the stages of adaptation to a chronic disease and lifelong therapy and understand that once the patient acknowledges and accepts hypertension as a lifelong situation, educational interventions can take place. Nurses in advanced roles should assist individuals to examine lifestyle including the individual's job status. These areas may need to be altered to make a therapeutic regimen successful. These areas are often difficult to change even when recognized as barriers and assisting the individual to use stress reduction and anticipatory guidance is an important nursing function.

The nurse may want to involve the family in counseling and educating the patient. This social and emotional support may increase the patient's self confidence in his/her ability to overcome barriers and lower psychological stress.

Educating the patient about hypertension and its treatment is another method to decrease barriers. Individualized educational strategies can help the patient appreciate the reasons for lifelong treatment and recognize the importance of taking medications even if there are no symptoms of disease. The nurse must assess the patient's ability and desire to learn and individualize educational approaches. The nurse must also encourage the patient to continue to learn as changes occur or regimens become more complex. At the same time, educational strategies should be combined with other strategies.

Individual educational sessions can prove successful for conveying support and information. The sessions can be individualized for each patient and can progress at the patient's rate of learning. Group sessions could also be successful because they allow for peer support and the patients can share problems and solutions. For example, by discussing barriers to taking medications, a group may come up with several suggestions or ways to remember to take medications. The group may also provide support and education concerning side effects and cost. Another educational strategy is self instruction. By providing the patient and support system

with an audiovisual about hypertension, pamphlets or books, the individuals can learn on their own and at their own speed. Self-instructional materials are also helpful to the patient when he/she needs a refresher course concerning some aspect of therapy. Because the materials are self taught, the patient is most likely to use them when he/she is motivated to learn, thus enhancing education.

The nurse may provide anticipatory guidance to the patient concerning perceived barriers and strategies for overcoming barriers. The patient may not perceive barriers as he/she begins the health care program, but as the patient continues the program, barriers may develop or become recognized.

The nurse may help the patient develop problem-solving strategies and coping strategies relative to overcoming barriers. Nursing interventions could include stress reduction and blood pressure monitoring by the patient and family with a goal being the patient taking an active role and determining the effects of his/her self care.

In the production and management phase (Orem, 1980), or evaluation phase, progress toward the goals and change in the system as necessary is assessed. Progress would be based on behavioral outcomes; decrease in barriers to taking medications, decrease in barriers to following diet, increase in ability to control job-related stress, and increased ability to follow health regimens and health outcomes; decreased

blood pressure and weight.

In summary, the clinical nurse specialist must encourage the hypertensive individual to take an active role in developing his/her therapeutic regimen for controlling hypertension. The patient must be encouraged to base the rationale for decisions on appropriate beliefs and attitudes. The nursing process; assessment, diagnosis, plan, intervention and evaluation should guide the nurse's role in assisting the individual. The nurse may take on the roles of counselor, resource person, educator, patient advocate, and use behavioral and educative strategies, when assisting the individual. The nursing profession should collaborate and consult with other health care providers and work employers to educate and develop individualized and appropriate therapeutic regimens for hypertensive individuals.

The nursing profession must become assertive in assisting hypertensive individuals to perform self care. Nurses should develop innovative nursing programs to assist individuals to recognize and overcome barriers. This means nurses must become politically aware and active and support policy changes that would recognize nursing assistance financially.

Finally, nurses must become knowledgeable about community resources that are available to assist hypertensive individuals and develop networks of resource people for consultation and collaboration.

Implications for Nursing Education

The recommendations for nursing education apply to undergraduate, graduate and continuing education programs for nurses.

Nursing education programs should include the Health Belief Model as a theoretical framework for predicting and understanding health related behaviors. Nurses should be educated to all variables in the Health Belief Model but special emphasis should be on perception of barriers. Nurses should be educated to the effect barriers have on individuals' abilities to follow therapeutic regimens. Nurses should be educated to the diverse behaviors the Health Belief Model has been used to describe; from preventive to sick role behaviors to chronic illness behaviors. At the same time, nursing education should focus on the "at risk" role as described by Baric (1969). The present study has introduced three potential variables that may influence individuals' ability for following therapeutic regimens, barriers to diet, barriers to medication and job barriers.

Educational programs for nurses should include the concept of the therapeutic regimen. Nurses should know there are often several correct and effective ways to treat a problem based on health care providers' preferences, success with interventions, and latest scientific findings. Nurses must also be educated to the nursing management plan and to the

use of nursing diagnoses when developing a plan of care for an individual.

It is important that educational programs include the concept of barriers and how barriers affect the ability to follow therapeutic regimens. An individual's perception of barriers to following recommended therapies must be taken into consideration when developing a nursing management plan. Nurses must know that each individual will have his/her own perception of barriers and that nursing management plans must be unique and individualized based on perceived barriers.

Nurses must also be educated to the fact that an individual's perceived barriers may be different based on what is expected in the therapeutic regimen. Thus, an individual may perceive certain barriers to taking medications, but these barriers may be different than perceived barriers to following a low sodium diet.

Nurses must become aware of the many types of perceived barriers and how important it is to overcome barriers to benefit from therapeutic regimens. At the same time, nurses must learn how difficult it is for individuals to change lifelong perceptions and barriers.

The concept of role barriers, particularly the barriers that may come about due to an individual's job must be a part of nursing education. People often do not receive as much support or recognition for the effects of a job on

following a therapeutic regimen. Nurses must recognize the effect a job has on producing barriers to following regimens. The nurse may be the one to identify job as producing barriers to an individual and his family.

Nursing education programs must include the effect of a chronic illness on an individual and his family. A person with a chronic illness has certain "rights" and "roles" that are different from a person with a terminal illness or an acute illness. The rights and roles of an individual with a chronic illness are often more ambiguous and of longer duration. Individuals and support persons often need to be educated to these rights and roles, and be taught ways to work within the "rules." Nurses must also be educated to the aspects of different chronic diseases and recognize that the rights and roles associated with hypertension differ from those associated with diabetes or renal failure.

Nursing education programs should also include the effects of sociodemographic variables on individuals' perceptions of barriers. Although the present study showed the sociodemographic variables had minimal effect on the major study variables, it is valuable to be aware of an individual's ethnicity, living arrangement, financial status, and educational level when developing nursing management plans.

Nurses must also be educated to the many nursing interventions that can be used to decrease an individual's perceived

barriers to following therapeutic regimens. Nurses must be aware of the different educative strategies: individual and group sessions, behavior modification, tailoring, cueing, when working with an individual to increase his/her perceptions of barriers. Nurses must also be taught to provide anticipatory guidance, especially to individuals who perceive job and changes in lifestyle as barriers. If the nurse can provide anticipatory guidance and discuss potential barriers with the patient, noncompliance may be reduced. Nurses must be educated to understand they can help individuals change beliefs by re-educating the patient.

Noncompliance is recognized as a major problem for hypertensive individuals. Nursing education should include factors associated with noncompliance and the role perception of barriers has in the concept of compliance.

Finally, nursing education programs should include the importance of using nursing diagnoses when developing nursing management plans. A nursing diagnosis describing the perceived barriers an individual has to following a therapeutic regimen would be invaluable when developing strategies to increase a hypertensive individual's adherence to a medical regimen. Diagnoses related to barriers to medications, barriers to diet, and job barriers could be included in the Health Perception-Health Management Pattern category.

Implications for Future Nursing Research

Many research studies have been carried out to examine individuals' perceived barriers to following therapeutic regimens. Perceived barriers to taking medications and following specialized diets have been addressed, but the effect of the social role of job as producing barriers to following therapeutic regimens has not been studied in previous research. Thus, the present study should be replicated to further test the research question of perceived job barriers to following therapeutic regimens.

Recommendations for future research would include assessing how the type of job, work hours, job description, and job satisfaction affect perceptions of job barriers. Another recommendation would be to use the interview method and open-ended questions to gather information about how hypertensive individuals perceive their job. The effect of job on taking antihypertensive medications verses following a recommended diet would provide an interesting study. The limitations of this study should be considered when designing the methodology for future study.

The study should be replicated using different types of sample populations: all men or all women or individuals who make up socioeconomic extremes. Men and women may perceive different barriers and a comparison of the differences could be done. Studies could be done using individuals in specific

age groups; for instance, young adults or old adults. A very interesting study would be a cross sectional study to compare or differentiate the types of barriers perceived by individuals in different developmental stages.

A longitudinal study analyzing how perceptions of barriers change over time as individuals go from one developmental stage to the next would be an interesting focus. The effect of the duration of a chronic illness on perceived barriers would also provide an interesting study. An individual newly diagnosed with hypertension may perceive different barriers than an individual who has had hypertension for ten years. The effect of the duration and/or complexity of the regimen on perception of barriers is also a recommendation for future research.

This study should be replicated using different socio-demographic variables; for instance, the economic status of the individual. Another study should be done to determine common sociodemographic characteristics of a group of hypertensive individuals who perceive a high percentage of barriers than compare and/or contrast the variables with a group of individuals who perceive a low percentage of barriers. From this research, it may be possible to develop "at risk" parameters.

This study should also be replicated using subjects with different chronic diseases. Using similar sociodemographic

variables, it would be interesting to compare or contrast barriers perceived by hypertensive individuals with those perceived by diabetic individuals or individuals with chronic obstructive pulmonary disease.

The subscales of beliefs about medications, beliefs about diet, and beliefs about job barriers could be expanded. Each subscale was comprised of five to seven beliefs. By increasing the number of beliefs, more perceived barriers may have been tapped. It is possible individuals did not perceive the same barriers as proposed by the researchers. Development of an open-ended questionnaire to identify perceived barriers to regimens would be another method for tapping barriers. Another method for tapping barriers would be to present patients with a list of potential barriers and have them rank the perceived barriers from perceived as barriers to not perceived as barriers.

This study should be replicated using different parts of the Health Belief Model and the effects of perception of barriers. Nursing research could include development of nursing interventions to help individuals decrease their perceptions of barriers. These interventions would be based on individual barriers identified by subjects. In the present study, perceived barriers were analyzed once; before a nursing intervention was initiated. A very interesting study would be to assess individuals' perceived barriers at two points

in time; before the nursing intervention then again half way through the nursing intervention as was done in the parent study. The number and type of perceived barriers at the two points in time may prove to be different.

Another recommendation for further research would be to assess how social support affects an individual's perception of barriers. Assessing the perceived roles of the patient and identified social support and how these roles may support or hinder a hypertensive individual's ability to follow a regimen could provide enlightening results.

Therapeutic regimens for controlling hypertension incorporate several treatment plans. An assessment of barriers by individuals who are following different regimens would make an interesting study. Finally, by defining perceived barriers as being determined based on an individual's self concept, perception of health, or locus of control would provide for several interesting studies.

The findings of this study have implications not only for nursing practice, but for other disciplines as well. Nurses and other professionals such as nutritionists, psychologists, pharmacists, and physicians must be aware of the barriers individuals perceive to following diets or taking medications. There is a need for increased awareness of the factors which may affect adherence to regimens designed to control hypertension. The perspective of several disciplines

is needed to develop strategies that would be helpful to hypertensive patients to reduce their perception of barriers. Thus, recommendations for future research would include:

1. Assess how the social role, job, affects or creates barriers to following therapeutic regimens.
2. Assess how individuals with different sociodemographic factors perceive barriers to following therapeutic regimens.
3. Assess how perceived barriers may change based on the duration or complexity of a regimen, the introduction of a nursing intervention, or a change in sociodemographic variables.
4. Assess how individuals with different chronic diseases perceive barriers to following therapeutic recommendations.
5. Assess how social support may affect perceived barriers.
6. Assess how a hypertensive individual's self concept, perception of health or locus of control affect perception of barriers.

In summary, interpretation of the research findings in the present study were discussed in Chapter VI. This chapter also included recommendations and implications for nursing practice, education, and research.

APPENDIX A

BELIEFS ABOUT HYPERTENSION INSTRUMENT

APPENDIX A

BELIEFS ABOUT HYPERTENSION INSTRUMENT

Everyone has certain beliefs about high blood pressure and what helps them to feel better. Below is a list of statements that some people believe about high blood pressure 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.

Please answer all questions in the following way.

If you strongly agree with the statement, then circle strongly agree.

If you agree with the statement, then circle agree.

If you are undecided about the statement, then circle undecided.

If you disagree with the statement, then circle disagree.

If you strongly agree with the statement, then circle strongly disagree.

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

   Strongly Agree Agree Undecided Disagree Strongly Disagree

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

   Strongly Agree Agree Undecided Disagree Strongly Disagree

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

   Strongly Agree Agree Undecided Disagree Strongly Disagree

4. My high blood pressure is well controlled.

   Strongly Agree Agree Undecided Disagree Strongly Disagree

APPENDIX A (Continued)

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

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

6. I believe that I can control my high blood pressure.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

7. In general, the doctor has helped my high blood pressure.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

8. High blood pressure is much less serious than pneumonia.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

9. My high blood pressure will go away when I don't have so many other problems.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

10. So many doctors have talked to me I don't know what to do for my high blood pressure.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

11. The treatment that has been prescribed isn't exactly right for me.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

12. I am not really sure I have high blood pressure.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

13. High blood pressure is not as serious as some people say.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

APPENDIX A (Continued)

14. Right now I have more important things to worry about than my high blood pressure.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

15. High blood pressure is much less serious than diabetes.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

16. Since my high blood pressure isn't serious, I don't have to worry so much.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

17. Taking care of my blood pressure is worth the effort it requires.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

18. Treatment for high blood pressure is doing me a lot of good.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

19. A person could do everything he/she is supposed to do to control high blood pressure but it won't help much.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

20. Some patients have to take pills (medication) to help control their high blood pressure. Do you take <u>any</u> pills for your high blood pressure? (check one)

a. Yes, take pills ___. (If you checked a., answer questions 21 thru to 31)

b. No, do not take pills ___ (If you checked b., go straight to question 31)

<u>Take Pills</u>

21. I could take my medications regularly if my family problems weren't so great.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

APPENDIX A (Continued)

22. I am confused by all the medications the doctor has given me.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

23. I would have to change too many habits to take my medications.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

24. If I take my medications I may become dependent upon them.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

25. I am not interested in taking my medications regularly.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

26. Taking my medications interferes with my normal daily activities.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

27. I believe that my medications for high blood pressure will help me to feel better.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

28. I must take my high blood pressure medications even if I don't think I am getting better.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

29. I believe that my medications will control my high blood pressure.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

30. Taking medication is something a person must do no matter how hard it is.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

APPENDIX A (Continued)

31. I believe that my medications will help prevent diseases (complications) related to high blood pressure.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

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

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

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

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

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

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

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

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

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

37. I cannot understand what the doctor told me about my diet.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

38. It has been difficult following the diet prescribed for me.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

APPENDIX A (Continued)

39. I have time to follow the diet the doctor ordered for me.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

40. I can count on my family when I need help following my diet.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

41. My husband/wife helps me to follow my diet.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

42. I believe that my diet will help prevent diseases (complications) related to high blood pressure.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

43. I must follow my diet even if I don't think I am getting better.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

44. Do you work outside your home for money either full-time or part-time? (check one)

a. Yes ___ (If you answered yes, answer questions 45 thru to 51)

b. No ___ (If you answered no, then go to the end of the questionnaire)

Work

Please indicate the extent of your agreement with each of the following statements that describe beliefs some people have about working and their illness. Circle one choice for each statement.

45. If I changed jobs it would be easier to take my medications.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

APPENDIX A (Continued)

46. My job does not interfere with taking my medications.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

47. I worry so much about my job that I can't take my medications.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

48. If I changed jobs, it would be easier to follow my diet.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

49. My work makes me so tired it is hard to follow my diet.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

50. I could control my weight if the pressures of my job weren't so great.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

51. It has been difficult to follow the work habits prescribed.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree

End: You have now completed this part of the questionnaire. Please begin answering the "Effects of High Blood Pressure" section.

APPENDIX B

SOCIODEMOGRAPHIC QUESTIONNAIRE

APPENDIX B

SOCIODEMOGRAPHIC QUESTIONNAIRE

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

1. Sex: Male ___ Female ___

2. Age: ___

3. What is your racial or ethnic background? (check one)

___ a. White
___ b. Black
___ c. Mexican-American
___ d. American Indian
___ e. Oriental
___ f. Other (specify)

4. What is your marital status? (check one)

___ a. Married
___ b. Single, never married
___ c. Separated
___ d. Divorced
___ e. Widowed

5. How many living children do you have, including adopted and stepchildren?

___ a. No living children
___ b. Number of living children (write in number)

6. Taking all sources of money into consideration, what was your family's total income before taxes and other deductions for the past 12 months? (check one)

___ a. below $5,000
___ b. $5,000-$6,999
___ c. $7,000-$8,999
___ d. $9,000-$10,999
___ e. $11,000-$12,999
___ f. $13,000-$14,999
___ g. $15,000-$16,999
___ h. $17,000-$19,999
___ i. $20,000-$24,999
___ j. $25,000 or over

APPENDIX B (Continued)

7. Are you working now at a regular job, unemployed, retired, a housewife, or what? (check one)

___ a. Working now at a regular job
(If you answered a., then answer questions 8 and 9)

___ b. Unemployed or laid off
___ c. Retired
___ d. Disabled
___ e. Housewife
___ f. Other (specify)
(If you answered b, c, d, e, or f, then go to question 10)

8. What is the main occupation you work at? (Write in what type of work you do) _____

_____

9. What kind of business or industry is that in? (Write in what they make or do. Is it your own business?)

_____

_____

10. How much schooling have you had (highest grade completed)? (check one)

___ a. None or some grammar school (less than 7 grades completed)
___ b. Junior high school (9 grades completed)
___ c. Some high school (10 or 11 grades)
___ d. Graduated high school
___ e. Technical, business, or trade school
___ f. Some college (less than 4 years completed)
___ g. Graduated college
___ h. Postgraduate college or professional

APPENDIX B (Continued)

11. Who lives in your household besides yourself? (check as many as apply)

___ a. No one else

___ b. Husband/wife

___ c. Children (write in number living at home)

___ d. Other relatives (write in relationships: example, mother-in-law; niece)

___ e. Non-related persons (write in: example, 2 friends; 1 boarder) _____

12. Do you have hypertension? (check one)

___ Yes (If you answered yes, then answer question 13)

___ No (If you answered no, then go to question 14)

13. How long have you had hypertension? (check one)

___ a. less than 1 year

___ b. 1 to 2 years

___ c. 3 to five years

___ d. 6 to 8 years

___ e. 9 to 11 years

___ f. 12 to 14 years

___ g. 15 years or more

14. Do you smoke cigarettes? (check one)

___ Yes (If you answered yes, then answer question 15)

___ No (If you answered no, then go to question 16)

15. How many cigarettes do you smoke in a day? (check one)

___ a. less than 5 cigarettes a day

___ b. 6 to 9 cigarettes a day

___ c. 10 to 19 cigarettes a day

___ d. 20 to 29 cigarettes a day

___ e. 30 or more cigarettes a day

APPENDIX B (Continued)

16. Do you drink alcoholic beverages? (check one)

___ Yes (If you answered yes, then answer question 17)

___ No (If you answered no, then go to question 18)

17. How often do you drink alcoholic beverages? (check one)

___ a. Occasionally

___ b. Weekends only

___ c. Several times a week

___ d. 1 to 2 drinks a day

___ e. more than 2 drinks a day

18. Do you have diabetes? (check one)

___ Yes (If you answered yes, then answer question 19)

___ No (If you answered no, then go to the end of the questionnaire)

19. How long have you had diabetes? (check one)

___ a. Less than 1 year

___ b. 1 to 2 years

___ c. 3 to 5 years

___ d. 6 to 8 years

___ e. 9 to 11 years

___ f. 12 to 14 years

___ g. 15 years or more

End: You have completed this part of the questionnaire
Please begin answering the next section.

APPENDIX C

PARTICIPATION LETTER

APPENDIX C

PARTICIPATION LETTER

October 14, 1980

Dear

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 15 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 strictly confidential. 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.

APPENDIX C (Continued)

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

Sincerely,

Dr. H. E. Crow, M.D.
Director

HEC/srt

APPENDIX D

CONSENT FORM

APPENDIX D

CONSENT FORM

The study in which you are about to participate is designed to find out the beliefs that persons with diabetes (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.

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

Signed _____ (signature of patient)

Date _____

APPENDIX E

FREQUENCY DISTRIBUTION BELIEFS ABOUT DIET SUBSCALE

APPENDIX E

Table 7

Frequency Distribution Beliefs About Diet Subscale

Statement	Sample N=	Perceived Statement as Barrier: No. of Subj.	Perceived Statement as Barrier: % of Subj.	Did Not Perceive Statement as Barrier: No. of Subj.	Did Not Perceive Statement as Barrier: % of Subj.	Mean Score	S.D.
Following my diet does not interfere with my normal daily activities	155	18	11.6%	128	81.6%	2.14	.856
I am always hungry when I stick to my diet	155	32	20.7%	104	67.1%	3.52	.935
I dislike the tastes of foods on my diet	155	19	12.3%	115	74.2%	3.74	.834
My personal life does not interfere with my diet	153	32	21.9%	110	71.9%	2.42	.998
It has been difficult following the diet prescribed for me	154	51	33.1%	84	54.6%	3.29	1.09
I have time to follow the diet the doctor ordered for me	154	15	97.7%	117	76.0%	2.22	.796
I can count on my family when I need help following my diet	154	34	22.0%	103	66.9%	2.46	.991

APPENDIX F

FREQUENCY DISTRIBUTION BELIEFS ABOUT MEDICATION SUBSCALE

APPENDIX F

Table 8

Frequency Distribution Beliefs About Medication Subscale

Statement	Sample N=	Perceived Statement as Barrier: No. of Subj.	Perceived Statement as Barrier: % of Subj.	Did Not Perceive Statement as Barrier: No. of Subj.	Did Not Perceive Statement as Barrier: % of Subj.	Mean Score	S.D.
I am confused by all the medications the doctor has given me	154	5	3.2%	145	94.1%	4.3	.676
I would have to change too many habits to take my medications	153	1	.7%	150	98.0%	4.4	.550
If I take my medications I may become dependent on them	153	12	7.9%	114	74.6%	3.9	.893
I am not interested in taking my medications regularly	154	4	2.5%	147	95.4%	4.3	.680
Taking my medications interferes with my normal daily activities	153	7	4.6%	14	92.1%	4.3	.759
I must take my high blood pressure medications even if I don't think I'm getting better	154	13	8.4%	132	85.7%	2.0	.804
I believe my medications will control my high blood pressure	153	3	2.0%	130	85.0%	1.9	.704
Taking medications is something a person must do no matter how hard it is	154	3	1.9%	146	94.8%	1.8	.591

APPENDIX G

FREQUENCY DISTRIBUTION BELIEFS ABOUT IMPACT OF JOB ON EFFICACY OF TREATMENT SUBSCALE

APPENDIX G

Table 9

Frequency Distribution Beliefs About Impact of Job on Efficacy of Treatment Subscale

Statement	Sample N=	Perceived Statement as Barrier: No. of Subj.	Perceived Statement as Barrier: % of Subj.	Did Not Perceive Statement as Barrier: No. of Subj.	Did Not Perceive Statement as Barrier: % of Subj.	Mean Score	S.D.
If I changed jobs it would be easier to take my medications	112	2	1.8%	107	95.6%	4.0	.804
I worry so much about my job that I can't take my medications	112	2	1.8%	109	97.3%	4.3	.580
If I changed jobs it would be easier to follow my diet	111	8	7.2%	99	89.2%	4.0	.804
I could control my weight if the pressures of my job weren't so great	113	3	2.7%	100	88.5%	4.0	.694
It has been difficult to follow the work habits prescribed	112	11	9.8%	92	82.1%	3.9	.850
My job does not interfere with taking my medications	112	3	2.7%	107	95.5%	1.7	.738

APPENDIX H

CORRELATION MATRIX: MODIFYING VARIABLES AND MAJOR STUDY VARIABLES USING PRODUCT MOMENT CORRELATION

Table 10

Correlation Matrix: Modifying Variables and Major Study Variables Using Product Moment Correlation

	Beliefs About Commitment to Medications	Beliefs About Commitment to Diet	Beliefs About Impact of Job on Efficacy of Treatment
Age	.0691	.2330**	.0459
Sex	.0690	.0572	.1549
Race	.0094	.0469	.1340
Marital Status	.0973	-.0557	-.0802
Living Arrangement	-.0204	.1341	.0824
Educational Status	.2253**	.0031	.1286
Work Status	-.1083	.0032	-.0412
Income	.1209	.0595	.0390
Duration of Diagnosed Hypertension	-.0906	-.1232	-.0458
Systolic Blood Pressure	.1710*	-.0221	.2024*
Diastolic Blood Pressure	-.0201	.1225	.0226
Weight	.0336	-.0328	-.1081

*significant at the .05 level

**significant at the .01 level

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