1989

A study of a blood pressure monitoring program for elderly hypertensive individuals

Carol A. Michnowicz
San Jose State University

Order Number 1339635

A study of a blood pressure monitoring program for elderly hypertensive individuals

Michnowicz, Carol Anne, M.S.

San Jose State University, 1989

U·M·I
300 N. Zeeb Rd.
Ann Arbor, MI 48106

A STUDY OF A BLOOD PRESSURE MONITORING PROGRAM FOR ELDERLY HYPERTENSIVE INDIVIDUALS

A Thesis

Presented to

The Faculty of the Department of Nursing

San Jose State University

In Partial Fulfillment

of the Requirements for the Degree

Master of Science

By

Carol A. Michnowicz

December, 1989

APPROVED FOR THE DEPARTMENT OF NURSING

Elizabeth O. Dietz

Elizabeth O. Dietz, RN, EdD, FNP

Virgil Parsons

Virgil Parsons, RN, DNSc

Bobbye Gorenberg

Bobbye Gorenberg, RN, DNSc

APPROVED FOR THE UNIVERSITY

M. Lou Lewandowski

ABSTRACT

A STUDY OF A BLOOD PRESSURE MONITORING PROGRAM FOR ELDERLY HYPERTENSIVE INDIVIDUALS

by Carol A. Michnowicz

This research study utilized a single group, pretest-posttest design to determine if a 3 month blood pressure monitoring program was effective for hypertension control of 21 elderly hypertensive individuals. A Self-Reporting Adherence Scale (SRAS), designed by the researcher, and a blood pressure reading were the two methods of measurement to determine blood pressure control. Both methods of measurement were administered prior to the implementation of the program and in 3 months at the completion of the program.

The statistical results indicated that there was not a significant difference between the pretest and posttest SRAS. However, there was a significant difference between the blood pressure readings that were taken before the initiation of the program and the readings at the completion of the program. Even though there was not a significant difference in self-reporting adherence, the program was effective for blood pressure control.

TABLE OF CONTENTS

		Page
LIST OF TABLES		vi
Chapter		
1.	INTRODUCTION	1
	Statement of the Problem	2
	Research Questions	3
	Purpose and Need	4
	Definitions	6
	Research Design	8
	Data Analysis	9
	Scope and Limitations	10
2.	CONCEPTUAL FRAMEWORK AND RELATED LITERATURE	12
	Conceptual Framework	12
	Summary	16
	Related Literature	17
	Summary	25
3.	METHOD	27
	Research Design	27
	Setting and Sample	29
	Procedure for Data Collection	31
	Instruments for Measurements	35
	Analysis of Data	40
4.	ANALYSIS AND INTERPRETATION OF DATA	43
	Demographic and Health Characteristics	43

Chapter Page

Research Question #1 46

Research Question #2 51

5. CONCLUSIONS AND RECOMMENDATIONS 57

Conclusions 57

Influencing Factors 60

Recommendations 63

Implications of the Study 66

REFERENCES 69

APPENDIXES

A. Self-Reporting Adherence Scale 76

B. Recommended Treatments Reference 80

C. Reinforcement Checklist 91

D. Blood Pressure Monitoring Guidelines. . . 93

E. Blood Pressure Card 96

F. Permission Letter 98

G. Consent Form 100

H. San Jose State University Human Subjects Institutional Review Board Approval . . 102

List of Tables

Table Page

1. Sign Test Scores From the Self-Reporting Adherence Scale of Respondents 48

2. Difference By Number and Percentage of Self-Reporting Adherence Scale 50

3. Difference Between Blood Pressure Measurements Before and After the Program 53

Chapter 1

INTRODUCTION

Hypertension is a disease that may affect people of all ages, but the age group most often diagnosed with the problem of high blood pressure is the elderly. It has been estimated that hypertension may affect as many as 50% of people over the age of 65 (Davidson & Caranasos, 1987). Many chronic and acute illnesses are related to untreated hypertension. Kannel et al. (1984) reported that hypertension increases the risk of heart attack, stroke, congestive heart failure, chronic peripheral vascular disease, aortic aneurysms, and renal decompensation. These authors further stated that, "the risk of each of the major cardiovascular diseases is directly related to hypertension, and even mild elevations impose a substantial excess risk" (p. 173A). Hypertension is a major public health problem for the elderly because it is prevalent among that age group, and because the sequelae of high blood pressure account for the majority of deaths in this country among elderly people (Gifford, 1987).

Because hypertension and its sequelae affect a large number of elderly people, treatment and control are advocated in order that its complications can be reduced and/or prevented. To control the disease of hypertension, elderly hypertensive individuals may be treated with a

medication therapy as well as nondrug therapies. The effectiveness of the treatment often depends on the adherence to the health care therapies. Though hypertension can be detected and treated by health care providers, the effectiveness of the treatment and the control of the disease is placed in the direct care of the individual. Therefore, in order to control hypertension, a positive self-care attitude by the elderly hypertensive individual is necessary to follow recommended treatments. Orem's (1985) theory of self-care may be utilized by the nurse in the community to assist elderly hypertensive individuals in developing positive self-care attitudes in controlling the disease.

Statement of the Problem

The number of elderly people in this country is increasing, and that fact creates a concern about the increased incidence of acute and chronic diseases. The disease of hypertension affects a large percentage of elderly people, and high blood pressure increases the risk of developing many associated diseases. Because of that concern, it would be beneficial to treat the disease of high blood pressure in order to prevent the increased mortality and morbidity that is related to uncontrolled hypertension (Davidson & Caranasos, 1987). Hypertension is treated with a combination of therapies that may include diet, exercise, and medication. In order to determine if hypertension is

being controlled, it is important to routinely evaluate the treatment for effectiveness.

Treatments for hypertension may be ineffective for various reasons. Adherence problems due to social, physical, and psychological limitations of hypertensive elderly individuals can be related to ineffective treatments (Gifford et al., 1986). Lack of adherence to a medical regimen has been studied by many researchers as the cause for treatment failure in hypertensive individuals. Sackett (1978) states that more research should be focused on testing strategies instead of reasons for lack of compliance. Therefore, this research was conducted to test a strategy to determine if a blood pressure monitoring program was effective in assisting elderly hypertensive individuals in controlling hypertension.

Research Questions

In order to determine the effectiveness of a blood pressure monitoring program, adherence to recommended treatments for hypertension was measured. A Self-Reporting Adherence Scale (SRAS), designed by the researcher, was the indirect method of measuring adherence (Appendix A). A second measure to verify adherence was the blood pressure readings. The following questions were addressed:

1. Is there a significant difference between the written pretest scores on the SRAS before the implementation of the blood pressure monitoring program and the posttest

scores at the completion of the program of regularly attending elderly hypertensive individuals?

2. Is there a significant difference between the recorded blood pressure readings before the implementation of a blood pressure monitoring program and the recorded blood pressure readings at the completion of the monitoring program of regularly attending elderly hypertensive individuals?

Purpose and Need

The purpose of this study was to determine if a blood pressure monitoring program can assist the elderly hypertensive individual in controlling hypertension. The monitoring program consisted of a routine screening to measure and record the blood pressure followed by individual reinforcement of recommended treatments of hypertensive elderly individuals. Gifford et al. (1986) addressed the need for assisting the elderly to adhere to treatments for hypertension. The purpose of the monitoring program was to assist elderly hypertensive individuals to take an active part in managing the reduction of their blood pressure.

Managing the disease of hypertension consists of recommended treatments that can vary somewhat, and there are four basic therapies. Those therapies for elderly hypertensive individuals include (a) medication, (b) diet, (c) exercise, and (d) follow-up visits to primary health care providers (Mosher, 1987; Kaplan, 1986).

Medication is primarily used to control hypertension, and there are a variety of medications that are effective for elderly individuals. Schulman and Gerstenblith (1986) advise the stepped-care approach as being safest for elderly individuals. This approach involves the use of (a) a diuretic as step one therapy, (b) a sympathetic depressant (adrenergic inhibitor) as step two therapy, and (c) a vasodilator as step three therapy (Appendix B). The stepped-care approach starts with a diuretic with a gradual addition of the other steps if necessary to control hypertension.

Even though medication is primarily used to control high blood pressure, nondrug therapy is also important. Dietary restrictions and exercise can also be a factor to control hypertension or to maximize the effect of the lowest dose of medication (Kaplan, 1986, p. 146). Using nondrug approaches in elderly hypertensive individuals is especially important. Medication should be minimized to prevent adverse reactions since elderly individuals are sensitive to drugs (Mosher, 1987). Often the nondrug therapy is ignored by primary health care providers because of lack of adherence to the therapy. Gifford et al. (1986) addressed that concern by reminding primary health care providers that other health providers, including nurses, are available to assist with the nondrug therapy. To further assess the effects of the drug and nondrug therapies, follow-up visits

to primary health care providers are included in the management of hypertension.

Uncontrolled hypertension is often asymptomatic which prevents individuals with the disease from recognizing the need for adherence to treatments (Borhani, 1985). In order to determine if hypertension is being controlled, a blood pressure reading is measured, and if found to be elevated, effectiveness of recommended treatments or lack of adherence can be evaluated. The detection of one elevated blood pressure reading does not necessarily mean a lack of compliance or ineffectiveness of treatment. However, a regular screening could detect a pattern with problems of medication, diet, or exercise which could necessitate a need for a referral or a follow-up visit for further evaluation of the therapeutic regimen. For a variety of reasons, a blood pressure may be elevated, and the measurement of three weekly readings can be beneficial in evaluating the blood pressure reading (Hartley, Velez, Morris, D'Souza, & Heller, 1983). Additionally, Souchek, Stamler, Dyer, Paul, and Lepper (1979) advise that three sets of readings should be taken at each visit. The mean of the three readings is the determinate of blood pressure status.

Definitions

The following definitions were used in this study. The definitions are a composite of many ideas, and the meanings are applicable for this research.

1. Adherence\Compliance is the self-reporting of the extent to which the elderly hypertensive individual's behavior of taking medications, following diet, performing exercise, attending follow-up visits, and changing lifestyle follows with health advice (Yoos, 1981).

2. Blood pressure monitoring program is a program consisting of a screening for blood pressure status and individual reinforcement of recommended treatments. The blood pressure status is the mean of the three readings that are measured at each visit (Souchek et al., 1979). The blood pressure is measured (a) on arrival, (b) after a pulse is palpated for 30 seconds and recorded, and (c) after individual reinforcement of recommended treatments. The recommended treatments for elderly hypertensive individuals are based on the protocols of the Recommended Treatments Reference (RTR) compiled by the researcher (Appendix B). A Reinforcement Checklist (RCL), designed by the researcher, is completed when reinforcement is provided (Appendix C).

3. Blood pressure screening is the measuring of the blood pressure according to Kaplan's (1986) guidelines (Appendix D), and the recording of the reading on the individual card given to the elderly for their records (Appendix E) and on the filed RCL.

4. Elderly are those individuals who have reached the age of 60 years and older which is the age that meets the

requirements of the retirement community selected as the setting for the study.

5. Hypertensives are those individuals who self-report that they have been diagnosed with high blood pressure and that they require antihypertensive medication.

6. Regular attendance is indicated by attending the blood pressure monitoring program once a month. Three consecutive weekly follow-up visits are required if the systolic blood pressure (SBP) is greater than or equal to 160 mm\Hg and\or if the diastolic blood pressure (DBP) is greater than or equal to 90 mm\Hg (Armstrong, 1987; Hartley, et al., 1983; Schulman & Gerstenblith, 1986).

7. Therapy refers to the utilization of a specific type of recommended treatment for hypertension. Therapies may include medication therapy or nondrug therapy (Kaplan, 1986, p. 147).

Research Design

The study was a single-group, pretest-posttest design. Measurements were taken prior to the start of the monitoring program and in 3 months at the completion of the program. "The single-group, pretest-posttest design has considerable intuitive appeal. One measures behavior, administers a treatment, and then measures behavior again. If there is a change, such change must be a result of the treatment" (Wood, 1981, p. 145). The 3 month time period for the monitoring program was based on other studies that were

conducted on hypertensive adherence (Stanton, 1987; Kerr, 1986).

Both indirect and physiological methods of measuring control of hypertension were chosen. The indirect method was a written Self-Reported Adherence Scale (SRAS) that was designed for this study by the investigator. Some of the questions for the SRAS instrument were based on a compliance scale of nominal forced response questions used in other studies including Sands and Holman (1985) and Morisky, Levine, Green, and Smith (1982). A Likert scale with forced response questions was devised to determine a more quantitative relationship in the pretest and posttest SRAS. A pilot study was conducted for content validity of the instrument. The SRAS was administered at the start of the monitoring program and repeated again at the completion of the 3 month program.

A blood pressure reading was the physiological method of measuring the control of hypertension. The blood pressure was measured with a mercury sphygmomanometer, and the guidelines of Kaplan (1986) who excerpted ideas from the American Heart Association and the Canadian Hypertension Society were followed (Appendix D). The first reading was taken prior to pretesting the SRAS. After completion of the 3 month monitoring program, the initial blood pressure reading was compared to the final reading to determine if there was a difference between the two readings.

Data Analysis

The data were analyzed by the use of descriptive, nonparametric, and inferential statistics. Descriptive statistics were used for demographics and health characteristics. Frequency and percentages were also used to determine differences between the medication therapy groups of the participants with the individual SRAS scores and the blood pressure readings.

A summation of the SRAS scores was compared to a nonparametric sign test which was applied to a chi square for a critical value in determination of difference between the pretest and the posttest. The mean blood pressure readings were tested for a difference by the use of a *t*-test.

Scope and Limitations

The study was limited to hypertensive individuals who were 60 years of age and over, and generalization to individuals with hypertension of other age groups is questionable. The sample size of 21 was not sufficient to enable generalization to all elderly hypertensive individuals. In addition to sample size, a sample of convenience was selected which also presented limitations for the study.

The indirect method of measurement and the diagnosis of hypertension requires self-reporting which also has limitations. Lobiondo-Wood and Haber (1986) state that

respondents may answer questions in a way that may be acceptable socially which may not always be truthful, but the researcher is forced to assume that the respondent is answering correctly. These authors stressed that self-reporting questionnaires are acceptable and are strong approaches to gathering information for research (p. 161).

The physiological method of measuring control of hypertension also has limitations. All avenues of compliance may be followed, but the blood pressure may be elevated due to other variables. Some over-the-counter and prescribed medications may be linked to elevated blood pressure (Berglund, 1985). Emotional factors may also cause an elevation of blood pressure. Marmot (1985) states that, "there is evidence in human subjects that emotional stimuli can raise blood pressure in the short term" (p. 100).

Besides these extraneous variables, the blood pressure instrument and method of measurement may also be factors in variability of blood pressure. Utilizing measurement guidelines when reading the blood pressure will decrease variability. However, certain extraneous factors cannot always be controlled during measurement which creates definite limitations.

Chapter 2

CONCEPTUAL FRAMEWORK AND RELATED LITERATURE

This chapter includes a discussion of the theoretical constructs of Orem as they relate to hypertensive elderly individuals and the role of the nurse. Related literature on hypertension control and the elderly individual is also reviewed. Studies conducted on adherence\compliance, factors affecting control of the disease, education intervention, and participation results are included.

Conceptual Framework

The conceptual framework used in the study is based on Orem's theories of self-care, self-care deficits, and the nursing systems. Orem (1985) addresses self-care as the practice of activities that individuals perform in order to maintain life, health, and well being (p. 84). The concepts of Orem can be integrated by nursing in assisting elderly hypertensive individuals to practice the activities of self-care in order to control the disease of hypertension. Because hypertension can be related to many other diseases, the maintenance of life, health, and well being can be jeopardized if the disease is not controlled. Control of the life-long disease of hypertension is placed in the direct care of the individual because of the type of treatment that is required for lowering the elevated blood pressure. Adherence to recommended treatments must be

established by the individual in order for the treatment to be effective.

Self-Care Deficit

Adherence to treatments for hypertensive elderly individuals involves self-care demands. The demands include drug therapies for hypertension that require knowledge concerning method of self-administration as well as awareness of side effects. These demands are often complicated by other medications that are taken by elderly individuals for other physical or emotional problems. The necessity of dietary restrictions, exercise, and follow-up visits are also involved in the demands that are included in the treatments that require adherence.

Adhering to treatments for control of hypertension is a therapeutic self-care demand. Orem (1985) states that a therapeutic self-care demand is "essentially a prescription for continuous self-care action" (p. 88). Because the disease of hypertension requires continuous action, a self-care deficit may occur if the therapeutic self-care demand is not met.

A self-care deficit may be complete, partial, real, or potential, and all of these types of self-care deficits may require nursing intervention (Harper, 1984). Orem (1985) defines an individual with a complete self-care deficit as one who has no capability to meet a therapeutic self-care demand. A partial self-care deficit may limit the

capability of an individual from meeting a therapeutic self-care demand (p. 128). A hypertensive elderly individual may have a self-care deficit that is complete or partial which presents a real or potential problem that needs assistance.

Role of the Nursing Agency

Self-care deficits for the hypertensive elderly individual in the community may be a complete or a partial self-care deficit which requires the support of another or an agency to intervene for problems preventing hypertension control. When hypertension is not being controlled, a therapeutic self-care demand needs to be met. Orem (1985) addresses the nursing agency as a helping service that utilizes deliberate action for the purpose of the well-being of others. The deliberate action of the nursing agency is based on nursing knowledge, disciplines, and experience which formulate the nursing system in practice situations (p. 143).

Harper (1984) conducted a study that applied Orem's theory of self-care for elderly, black, hypertensive women. The study dealt with a control group (n = 30) in a hypertension teaching program and an experimental group (n = 30) in a medication self-care program during a 6 week period. The results showed that the nursing system was effective in assisting the elderly hypertensive women with medication self-care deficits. However, follow-up studies 4 weeks after the program showed a diminished effect.

Orem (1985) identifies the actions of the nurse in several capacities while influencing self-care. The nursing system is described by Orem as (a) wholly compensatory nursing systems, (b) partly compensatory nursing systems, and (c) supportive-educative nursing systems. In the wholly compensatory nursing system, the individual is unable to engage in self-care which requires the nurse to recognize and to perform the therapeutic self-care. The partly compensatory system is necessary when the individual can perform some self-care but needs assistance. When the individual can accomplish self-care but needs some regulation or guidance, the supportive-educative system is effective (p. 153).

The supportive-educative nursing system describes the actions for the role of the nurse in the community in assisting elderly hypertensive individuals in controlling hypertension. The nurse provides assistance by offering guidance and support. Teaching and consultation are also important factors in assisting elderly hypertensive individuals in meeting therapeutic self-care demands. By meeting therapeutic self-care demands, the elderly hypertensive individual is practicing self-care.

Even though the individual performs the actions of self-care, the nurse in a supportive-educative nursing role can be instrumental in assisting with the practices of the self-care theory. Chang, Uman, Linn, Ware, and Kane (1985)

conducted a study on adherence to health care regimens by elderly women using the conceptual framework of Orem. This study tested 268 women (ages 56-89) at 26 senior citizen centers in a metropolitan area. Their intent to adhere to health care therapy was tested by the use of hypothetically depicted medical scenarios via video tape viewing. The purpose of the study was to determine if specific components of care could be related to intent to adhere to health care regimen of nurse practitioners by elderly women. The study by Chang et al. was able to partially support Orem's self-care theory by determining that the changes in basic self-care actions were integrated by the nursing actions, thereby creating an intent to adhere. When the individual characteristics remained constant, the study did not show a significant relationship with intent to adhere.

Summary

With the hypertensive elderly individuals having the decision of adherence, the nurse can help to influence the decision by providing information about the treatments of the disease and the necessity of adherence. Providing reinforcement of recommended treatments, measuring the blood pressure, and recording the blood pressure readings on records retained by the hypertensive elderly individual are actions by a nurse to influence self-care. Chang et al. (1985) stated that, "self-care does not preclude obtaining relevant information from physicians or nurses, it shifts

decision making to patients" (p. 27). This action can also stimulate personal control of the disease by the individual. The nursing system is using deliberate action to influence hypertensive elderly individuals to perform activities to maintain life, health, and well-being as described by Orem (1985) in the concept of the self-care theory.

Related Literature

The importance of managing hypertension of elderly individuals has been documented in the literature based on recent studies and clinical trials. The European Working Party on High Blood Pressure in the Elderly (1985) conducted clinical trials on diuretics with 840 individuals with the average age of 71 years old. There was a decrease in blood pressure in the treated individuals over a 5 year period. The overall mortality rate was also decreased from cardiovascular, cardiac, and cerebrovascular diseases. The Hypertension Detection and Follow-up Program (1979) and the Australian National Blood Pressure Study (1980) obtained similar results in individuals between the ages of 60-69 years old. Once treatment is started, Gifford et al. (1986) state that it is important for elderly hypertensive individuals to be evaluated for effectiveness of management which includes problems that may interfere with adherence to recommended treatments.

Adherence\Compliance Studies

Research studies have been conducted on hypertensive

individuals of all age groups concerning adherence\compliance with prescribed therapy, and more recent studies have focused on studies of elderly hypertensive individuals (Sands & Holman, 1985; Bandini, 1981; Morgan, Nowson, Murphy, & Snowden, 1986). Some studies are directed at reasons for compliance or noncompliance, and both conflicting results and agreement have been established.

Age is often a factor discussed for determination of compliance, but that factor is also controversial in the literature concerning the elderly population. The results of a study by Bile (1977) were based on a telephone questionnaire 1 month after teaching interventions were instituted. The individuals (n = 24) ranged from 32-75 years old, and the results indicated that the older individuals were more compliant than the other age groups in the study. The specific age for the older individuals was not mentioned. On the other hand, Sands and Holman (1985) using a written self-reporting compliance scale on 93 elderly hypertensive individuals between the ages of 65-100 years old found that an increase in age showed less compliance. The subjects for Sands and Holman were older elderly hypertensive individuals, which may be a factor for the discrepancy.

Studies conducted specifically on hypertensive elderly individuals showed conflicting results with regard to

knowledge enhancing compliance. Sands and Holman (1985) conducted a study in a senior center blood pressure screening over a 4 week period using a written self-reporting compliance scale and a knowledge scale. The results indicated that hypertensive elderly individuals with a high degree of knowledge about the disease and treatments were not more compliant than those who lacked knowledge.

On the other hand, Bandini (1981) indicated that lack of knowledge was related to failure to follow recommended treatments. Bandini tested 45 elderly hypertensive individuals about hypertension knowledge using a descriptive survey. Results showed that participants were lacking knowledge about the disease and the treatments. The author stressed that 51% of the tested individuals had systolic blood pressures over 160 mm\Hg indicating noncompliance with treatments. While lack of knowledge was discussed as the reason for noncompliance, other factors including ineffective treatment were not discussed as the factor for elevated blood pressure.

Fletcher, Fletcher, Thomas, and Hamann (1979) concur that lack of knowledge about medication results in failure to follow medical advice. Interviewing 143 elderly hypertensive individuals after an office visit about their hypertension medication, results showed that 66 (42%) of the individuals were unaware of their correct dosage schedules. The physicians were also interviewed to compare the

information given by the individuals to the actual medication prescribed. The authors concluded that lack of communication between the physician and elderly hypertensive individuals results in noncompliance with medical treatments. Morgan et al. (1986) reviewed numerous studies on compliance of elderly hypertensive individuals. The research showed that two main factors that were successful in achieving compliance were simplification of drug therapy and the "use of informed personnel giving adequate explanations" (p. 174). Giving adequate information about the disease and the reinforcement of recommended treatments for hypertension can be accomplished in a blood pressure monitoring program for elderly hypertensive individuals.

Factors Affecting Hypertension Control

Research has shown that specific strategies can assist in hypertension detection and control (Young, 1986). Drug and nondrug therapies are often ordered to control the disease, and the drug type and dosage is dependent on the blood pressure reading. Prescribing a simplified but effective medication at the correct dose for elderly hypertensive individuals is important because of the sensitivity to medication by elderly individuals (Mosher, 1987). The medication and dose is often prescribed on the basis of an elevated blood pressure that was measured in the primary care provider's office.

Often the physician is the primary care provider, and

Pickering et al. (1988) conducted a study to determine if some individuals have an elevated blood pressure reading only in the physician's office. This phenomena is referred to as "white coat" hypertension. The study used three groups of subjects who were classified as (a) normotensive (n = 37), (b) borderline hypertensives whose diastolic blood pressure was between 90 and 104 mm\Hg (n = 292), and (c) established hypertensives (n = 42) whose diastolic blood pressure was equal to or above 105 mm\Hg. All of the subjects, except the normotensive volunteers, were chosen from referral evaluations at one hospital cardiovascular center, and no antihypertensive medication was administered during the 4 week testing period. A mercury sphygmomanometer was used by the physicians and technicians, and the 24-hour blood pressure recorder was tested prior to being fitted to the individuals. Twenty-one percent of the 292 borderline hypertensives and 5% of the 42 established hypertensives were considered as having white coat hypertension. Those individuals had elevated blood pressure readings in the physician's office, but a technician's reading and an ambulatory monitored reading were normal. Even though this study was conducted on individuals whose ages ranged between 31 and 47 years old, the possibility of white coat hypertension should be applied to elderly hypertensive individuals so that medication therapy can be correct. The results of the research suggests that other

health personnel and different settings may be more conducive to an accurate blood pressure reading.

Besides the variation of the blood pressure reading in the physician's office, the single reading of a blood pressure in any setting may not be indicative of blood pressure status. Souchek, Stamler, Dyer, Paul, and Lepper (1979) have shown through an 8 year longitudinal study of 1,777 men that two or three blood pressures readings at a visit are more indicative of a true reading on which to base treatment. The participants ranged in age from 40-55 years of age and were employees of Western Electric in Chicago. These authors stressed that blood pressure assessment at community screenings and health facilities are more precise if at least two or three readings at a single visit are performed and the mean should be used as the measure of the level.

For hypertension to be controlled, follow-up visits are necessary. The Joint National Committee on Detection, Evaluation, and Treatment of High Blood Pressure (1984) recommends that stable hypertensive individuals, regardless of age, be seen every 3-6 months for continuity of care and control of the disease. McClellan, Hall, Brogan, Miles, and Wilber (1988) surveyed 4,688 adults, including 512 over the age of 60 years. Twenty percent of the age group over the age of 60 years was classified as "nonattenders," meaning that they did not receive follow-up care in 6 months.

Jones, Jones, and Katz (1987) used a control group and a combination of 3 intervention methods involving instruction and phone calls to improve follow-up visits. This study involved 72 subjects, of which 16 were over the age of 60 years, and no association was found between age and compliance. However, the research did show that 47% more of the experimental group were more likely to attend appointments made for them than the control group.

Education and Participation Intervention

Studies have been conducted on elderly hypertensive individuals to determine the effects of education on hypertension control. Morisky, Levine. Green, and Smith (1982) conducted a 5 year study on 350 ambulatory subjects, of which 90 were 65 years of age or older. Three types of educational interventions were available depending on the specific needs of the individual. The interventions consisted of (a) conferences that lasted from 5-10 minutes after a medical appointment, or (b) three 1 hour group sessions about management of the disease, or (c) reinforcement of family for individual support. The results of the study showed that at the end of 5 years, both age groups continued to increase the proportions of their blood pressure control. The younger group (n = 260) had an 83% increase in blood pressure control from baseline to 5 years while the elderly group (n = 90) increased 90% over the same time. Besides blood pressure control, the study also

demonstrated that the elderly subjects were more compliant with drug therapy and follow-up visits than the younger subjects who were exposed to the same interventions.

In contrast, Pender (1984) conducted a study involving health counseling and relaxation methods. The 44 participants ranged between 28-62 years of age, with a mean age of 55 plus or minus 8 years. The number of elderly individuals in the study was not mentioned. For a 6 week period, the control group received health counseling, blood pressure monitoring, and weight checks, while the experimental group received individual and group relaxation methods. The control group with health education and blood pressure monitoring showed no difference in blood pressure readings at the completion of the study. However, the experimental group who received the relaxation methods showed a lower systolic and diastolic blood pressure reading. Since the experimental group received no health education, the relaxation method was more effective than the educational interventions in reducing blood pressure readings.

Active participation by individuals in their health care is another consideration in controlling hypertension. Schulman (1979) studied hypertensive individuals and determined that active participation among individuals increased the likelihood of blood pressure control as well

as more positive behavioral responses to their disease and the management of it.

In another study on participation, Strull, Lo, and Charles (1984) studied 210 hypertensive individuals between the ages of 28-82 concerning their preference in medical decision making. The total number of elderly individuals in the study was not mentioned, but the mean age was 58 years old. In the same study, 50 clinicians (41 physicians and 9 nurse practitioners and clinical pharmacists) were questioned about their appreciation of shared decision making between clinician and client. The study showed that 41% of clients preferred more information, and 53% wanted more participation in decisions. On the other hand, the clinicians' response was lower at 29% for clients who desired more information, and their response of 78% for client participation was higher than client response. Strull et al. stressed that the difference in the figures indicate that more communication is needed regarding individual participation and medical decision making. The difference also indicates that a concern exists for more information that is requested from hypertensive individuals concerning therapy about the disease of hypertension.

Summary

Adherence\compliance to a prescribed therapy is necessary for hypertensive elderly individuals to manage the disease of hypertension (Gifford, 1987). Studies have shown

agreement and conflicting results about factors that enhance adherence\compliance with recommended treatments for hypertension control among the elderly. Adherence to treatments for hypertension is necessary for control of the disease, but methods of encouraging self-care of the disease is complex. Multiple alterations in behavior for a disease that may have no immediate discomforts for the individual is partly responsible for the complex task of encouraging adherence (Swain & Steckel, 1981).

Age, knowledge of the disease, medication dosage, and awareness of drug results and side effects have been studied as reasons for compliance and noncompliance. The method of measuring the blood pressure reading, follow-up care, education intervention, and active participation in the care have been effective in some studies and ineffective in others. Evidence points to two factors that have been most effective in encouraging adherence to recommended treatments. These factors are a simplification of drug therapy and the utilization of health care personnel who can give pertinent information about the disease and the treatments of hypertension for elderly individuals (Morgan et al., 1986).

Chapter 3

METHOD

This chapter includes a discussion of the methodology of the study of a of blood pressure monitoring program for hypertensive elderly individuals. The research design, sample and setting, procedure for data collection, instruments for measurement, and data analysis are included.

Research Design

The study was a single-group, pretest-posttest design to determine if a blood pressure monitoring program was effective in controlling hypertension of elderly individuals. The single-group hypertensive elderly individuals were tested by a physiological method and by an indirect method of measurement prior to the implementation of a blood pressure monitoring program. After a 3 month monitoring program was completed, the same two methods were measured and differences were determined. Wood (1981) stated that the single group, pretest-posttest design measures a change in behavior, and she emphasized that the change in behavior is determined by measuring behavior before and after administration of treatment (p. 145). If a behavior change occurs, the introduced treatment can be considered the factor responsible for the change.

The physiological method of measuring blood pressure control was a blood pressure reading. The systolic and

diastolic blood pressure reading that was taken prior to the initiation of the program gave an indication of the blood pressure control before a blood pressure monitoring program was started.

The indirect method of measuring blood pressure control was the use of a Self Reporting Adherence Scale (SRAS) that was designed by the researcher (Appendix A) to determine the degree of adherence/compliance to recommended treatments prior to the monitoring program. After both the physiological and indirect methods were measured, the intervention of blood pressure screenings and the reinforcement of recommended treatments were instituted on a weekly basis. After a 3 month period, both methods were again measured to determine if there was a significant difference between the pre and post methods of measurement.

Since the study sought to determine if there were significant differences between the measurable methods prior to and after the intervention of a blood pressure monitoring program, the pretest-posttest design was the most feasible. Posttesting with the same SRAS instrument may sensitize subjects to the questions, and the scores may be higher due to the experience gained through testing (LoBiondo-Wood & Haber, 1986, p. 109). The fact that the posttest was given 3 months after the pretest may decrease the possibility of sensitized subjects. Because of this possibility, the physiological method of a blood pressure reading after the

intervention gave an added measurement for results in determining blood pressure control.

Setting and Sample

The setting selected was a 100 resident retirement home located in northern California where a blood pressure screening service was not available on a regular basis. Permission from the participating institution was obtained (Appendix F), and approval through San Jose State University Human Subjects Institutional Review Board was granted prior to testing (Appendix H).

All of the residents were informed of a weekly blood pressure screening on the premises, and the participants were chosen from a sample of convenience from those residents attending the clinic. A sample of convenience was chosen in order to obtain an adequate sample size. The age criteria to be a resident of the retirement home is 60 years of age or older, and for that reason, the age requirement to participate in the study was the same. All residents who identified themselves as being on medication for hypertension were eligible to participate in the study. Their age and the fact that they were on medication for hypertension was verified only by their own admission.

According to Davidson and Caranasos (1987), 50% of elderly individuals have the disease of hypertension, which meant that 50 of the residents would be eligible to be subjects for the study. The number 50 was based on the fact

that all of the residents would participate in the study, but since 100% participation was unlikely, that number is inflated. The fact that only those hypertensive individuals being medicated for the disease were eligible, and that a 3 month study could have a drop-out rate, the sample size was based on the number of residents who attended the blood pressure screenings. Over the 3 month period, 46 elderly individuals attended the screenings of which 23 were eligible to take part in the study. The sample size of 23 from the 46 who attended the blood pressure screening correlates with Davidson and Caranasos estimation that 50% of elderly have the disease of hypertension.

The residents not participating in the study were offered the blood pressure screening which involved measuring their blood pressure and recording the measurement on cards given to the elderly individuals. If an elderly individual who was not diagnosed as being hypertensive had an elevated blood pressure reading, the resident was advised to return for three weekly readings for evaluation. Referrals were to be made to primary health care providers if the blood pressure remained elevated for three consecutive weekly readings. No referrals were necessary for the nonparticipants of the study, but those residents who had an elevated reading were advised to attend the blood pressure screenings once a month for further evaluation.

Procedure for Data Collection

The residents were informed of a weekly blood pressure screening by a notice in the monthly calendar at the retirement home. Fliers were also sent to each resident by the retirement home director. The fliers supplied written information about (a) the time and frequency of the screening, (b) the investigator, (c) the location of the screening within the retirement home, and (d) the fact that a study was being done on hypertensive elderly individuals in conjunction with the blood pressure screenings. All residents were invited to attend the blood pressure screenings, but only those meeting the criteria already described were asked to participate in the study. The other residents were invited to attend the blood pressure screening as previously described.

The investigator measured and recorded the blood pressure reading, and if verbal confirmation determined that the elderly individual was on blood pressure medication, individually, they were asked to volunteer for the study. Each participant was informed of the study, and a written consent form was reviewed with them and signed (Appendix G). Information about the fact that no identifiable physical or mental risks were involved with the study was communicated verbally and on the consent form. Benefits of learning more about hypertension and the control of the disease among elderly individuals were stressed. The consent form also

included the investigator's name and other information if they wished to direct questions or concerns about the research as well as to obtain results.

The participants were asked to read the questions and to answer by circling the number under the word that best described their behavior. They were also informed that there were three questions that contained if in the question and to answer the question only if it applied to them. One blind participant had the questions read, and the responses were recorded by the researcher.

Four demographic questions were also included which involved checking the correct response or a brief written response. One health status question was asked which involved a list of medical problems. Many of the participants had difficulty answering this question completely by a written response. They were able to supply the information when they were asked to bring either a list of their medications or the medication containers to verify their medical treatments.

Confidentiality was maintained and stressed on the consent form. Names of participants were not used on the SRAS, but each participant was assigned a number at pretesting so the same person was posttested in order to determine a difference with the results. The assigned number with the name was written on a separate form, kept in a locked drawer, and known only by the researcher. After

the data collection was completed, the form with the assigned number was destroyed to maintain confidentiality.

The initial blood pressure reading, the explanation of the consent form, and the completion of the SRAS pretesting and demographic questions took approximately 15 minutes. Each participant was informed of the length of the study as well as the day and time for the monitoring program. On the first day of testing, 33 residents attended the blood pressure screening and 10 of them were eligible and volunteered to participate in the study. A resident who was also the chairperson of the council for the retirement home assisted in obtaining more subjects for the study. The chairperson made announcements at lunch and dinner to inform and\or remind residents of the blood pressure screening and the study. By the end of 3 weeks, a total of 46 residents attended the blood pressure screening, of which 23 volunteered for the study. At the completion of the 3 month study, 21 participants regularly attended the blood pressure monitoring program. One man and one woman who had started the study did not attend the program after the initial testing.

Each Tuesday from June 20, 1989, and ending September 19, 1989, between the hours of 8:30 AM and 11:50 AM, the investigator conducted the blood pressure monitoring program. The program consisted of a blood pressure screening and individual reinforcement of recommended

treatments for hypertension of elderly individuals. A Reinforcement Checklist (RCL) was utilized for each individual participant (Appendix C). In order to provide continuity of reinforcement, a Recommended Treatment Reference (RTR) was available as a resource teaching guide (Appendix D). The RTR and the RCL were developed for the study by the researcher. Nursing 89 Drug Handbook (1989) and Understanding Nutrition (Whitney & Hamilton, 1981) were available to complement the RTR. Blood pressure readings were recorded on the filed RCL and on the blood pressure cards (Appendix E) given to the elderly for their records. The residents were encouraged to share their blood pressure card with their primary health care provider on follow-up visits.

After the monitoring program was started, the participants were advised to return once a month. The date for the return visit was written on their blood pressure card. If a systolic blood pressure (SBP) was equal to or greater than 160 mm/Hg and/or if a diastolic blood pressure (DBP) was greater than or equal to 90 mm/Hg, then three consecutive weekly readings were required. Referrals were made to primary health care providers when the SBP remained greater than or equal to 160 mm\Hg and\or the DBP remained greater than or equal to 90 mm\Hg after three readings. Seven participants required referrals. Referral statistics were maintained and recorded on the filed RCL. Regular

attendance at the program was determined at the completion of the study by the number and reading of recorded blood pressures on the filed RCL.

Instruments for Measurements

A blood pressure reading was the physiological method for measuring hypertension control, and the sphygmomanometer was the instrument used for measuring blood pressure. A mercury manometer was used because it is considered to be more accurate than an aneroid manometer (Kaplan, 1986, p. 35). In order to decrease variability in blood pressure readings during measurement, the guidelines of Kaplan were followed (Appendix D). The guidelines included the (a) cuff size and placement, (b) arm position, (c) eye level of observer, and (d) proper inflation and deflation of cuff. Precautions and hints were also followed according to the guidelines of Kaplan.

Three blood pressure readings were taken at each visit. A blood pressure was measured on arrival, after a pulse was palpated for 30 seconds and recorded, and after reinforcement of recommended treatments. The mean of the three readings was recorded in order to obtain a more accurate blood pressure status (Souchek, Stamler, Dyer, Paul, & Lepper, 1979).

Besides the physiological method of measurement, an indirect method was utilized for measuring hypertension control. Since adherence to recommended treatments is

necessary for control, a scale for measuring adherence was designed by the researcher. The Self Reporting Adherence Scale (SRAS) was based on a compliance scale used by Sands and Holman (1985) and Morisky, Levine, Green, and Smith (1982). When used by Morisky et al., the scale contained four questions, but two more questions were added when used by Sands and Holman.

The compliance scale used in the other studies was a questionnaire of nominal forced response of yes and no only for answers. Each question was given one point, and the degree of compliance was based on the number of correct responses. The four original questions dealt with adherence to taking medication. The questions were:

1. Do you ever forget to take your medicine?

2. Are you careless at times about taking your medicine?

3. When you feel better, do you sometimes stop taking your medicine?

4. Sometimes, if you feel worse when you take the medicine, do you stop taking it?

When Sands and Holman (1985) used the scale, two questions were added. The two questions were:

1. Are there any reasons why you might not follow your doctor's advice?

2. Did you miss your last appointment to see your doctor or nurse about your high blood pressure?

The original concern about medications adherence was retained in the SRAS design, but five questions were formulated that involved medication therapy for hypertension. The adherence to medication questions was changed to focus more specifically on frequency, dosage, and factors interfering with continuity of medication therapy.

Besides the five questions on medication adherence, three other questions were included in the SRAS that involved nondrug treatments for hypertension. These questions dealt with adherence to exercise, diet, and follow-up care. To obtain a more quantitative relationship between the pretest and the posttest, the SRAS offered a choice of five forced responses in a Likert scale. The scale responses ranged from never (1) to always (5) for a determination of quantitative adherence to therapy.

Three of the questions were if questions which meant that the question needed to be answered only if it was applicable to the participant. Two of the if questions were in reference to nondrug therapies that may have been part of their therapeutic regimen to decrease their blood pressure. These were included because the hypertensive elderly individuals participating in the study were required to be on medication in order to participate, but the nondrug therapies may not have been included in their medical therapy. Adherence to the nondrug therapies was being tested only if it was previously advised. The other if

question referred to the adherence pattern of new medication, and if the hypertensive elderly individual was on the same medication for a long period of time, it did not apply to them.

Since the SRAS instrument was designed for the study, a test for validity content was necessary. LoBiondo-Wood and Haber (1986) state that content validity is necessary in order to determine if the contents of the tool are representative of the behavior domain (p. 186). To evaluate the content validity, a pilot study was conducted. Eight elderly hypertensive individuals who work as volunteers at a local hospital agreed to complete the SRAS and the demographic questionnaire.

The pilot study revealed that one question created a problem for all of the volunteers. That question was: If you feel worse when you take blood pressure medicine, do you continue to take the medicine?

The purpose of the question was to ascertain if the transitory, uncomfortable feeling that sometimes occurs when placed on new antihypertensive medication would cause a lack of adherence with the prescribed medicine (Kaplan, 1986, p. 210). Three elderly individuals thought that the question pertained to whether their blood pressure medication was taken when an illness occurred that was unrelated to their hypertension. The other volunteers thought that the question was referring to a sudden

occurrence of feeling worse from the medication not being effective. In order to clarify the question, it was changed to:

1. Sometimes if you feel worse after you take a NEW blood pressure medicine, do you continue to take the medicine?

Another question that created a problem for four of the volunteers was:

2. If you have been told to avoid certain foods or to change your eating habits to decrease your blood pressure, how often do you stick to your diet?

Each of the four volunteers thought that the word diet was only indicative of a weight reduction diet and denied that they were told about dietary changes, even though they were on a salt reduction diet. The question was reworded to read:

2. If you have been told to avoid certain foods or to change your eating habits to improve your blood pressure, how often do you follow your instructions?

After making the correction, two more volunteers were asked to complete the test and no problems were found. The actual time in answering the questions was timed, and the least amount of time was 3 minutes and the most was 7 minutes.

Attached to the pretest SRAS, a demographic questionnaire was included. Five questions were asked in

order to determine demographic characteristics of the sample which assisted in evaluating the sampling procedure more accurately (LoBiondo-Wood & Haber, 1986, p. 218). Two questions that involved a brief medical description as well as the onset of the disease of hypertension were included for determination of factors that may influence the severity of the hypertension.

Analysis of Data

Descriptive statistics were used to describe the demographic and present health characteristics of the total sample (N = 21). Frequency and percentages were also summarized for the individual SRAS scores and blood pressure readings as a method to show a comparison of scores and readings between the pre and post methods of measurement.

A nonparametric sign test was the method of analysis for determining if there was a significant difference between the pretest and posttest scores of the SRAS instrument. The sign test is used in a before and after type of study when categorical or ranked data are used (Gilbert, 1981, p. 167). Since the SRAS was coded with responses ranging from a sequential code of 1 for never to 5 for always, a summation of total scores was calculated for each pretest and posttest. Only the questions that were answered in both the pretest and the posttest were included in the summation of the score. If a question was answered on the pretest and not on the posttest, or vice versa, the

question was excluded. Positive and negative differences were determined, and the zero scores were eliminated with the sample number reduced accordingly. The results of the sign test were compared to chi square with one degree of freedom in order to determine the probability of association of the sign test values (Schuyler, Cormier, & Bounds, 1974, p. 203).

In order to determine if there was a significant difference between the pre and post measurement of blood pressures overall, inferential statistics were used. A dependent two-tailed t test was calculated for the difference between the pre and post diastolic blood pressure readings and the same type of test was calculated for the pre and post systolic blood pressure readings.

The respondents were also subclassified into two medication therapy groups in order to determine if there was a significant difference in blood pressure control. One group consisted of those hypertensive elderly individuals who were on one type of antihypertensive medication (mono pharmacotherapy), and the other group included those who were on more than one antihypertensive medication (multiple pharmacotherapy). The mean change was calculated for each group from the mean between the pre and post readings for the diastolic and the systolic blood pressure readings. In order to determine if a significant difference existed between the diastolic and the systolic blood pressure

readings of the two groups, an independent *t*-test was utilized. Tables were provided for clarification of the results of the blood pressure readings and the SRAS scores.

Chapter 4

ANALYSIS AND INTERPRETATION OF DATA

This chapter includes the analysis and interpretation of the data of the study of a blood pressure monitoring program. The descriptive analysis of the demographic and present health characteristics is included. The research questions concerning the methods of measurement for determination of differences in blood pressure control are examined, and the results are discussed.

Demographic and Health Characteristics

Demographic and health characteristics were obtained from written information from a questionnaire that was included with the pretest. Besides the written information, some of the health characteristics were obtained when the participants verbally self-reported their current medication therapy. This information was obtained from the 21 elderly hypertensive individuals who completed the study and regularly attended the blood pressure monitoring program. Twenty-three hypertensive individuals started the study, but one man and one woman did not complete the program.

Sex, Marital Status, and Age

Eighteen (86%) of the participants were female. Of the 21 participants, 3 (24%) were married and 18 (86%) were widowed. Both spouses of only one married couple participated.

The ages of the participants ranged from 72-91 years. The mean age was 84 years, with a standard deviation of 6 years. Participants were diagnosed with the disease of hypertension as early as the age of 40 and as late as 83 years of age. Five (23%) participants did not list an age when their disease was diagnosed. The mean age when treatment was first started for 16 of the participants was 67 years of age, with a standard deviation of 14. Four (25%) were diagnosed with hypertension prior to the age of 60 years, but the large majority (75%) were diagnosed after 60 years of age.

Antihypertensive Medication Therapy

All of the elderly individuals were on antihypertensive medication. Eleven (52%) of the participants were receiving only 1 antihypertensive medication (mono pharmacotherapy), while 10 (48%) were receiving 2 or more antihypertensive medications (multiple pharmacotherapy). The classifications and types of drugs varied, and the stepped-care approach of antihypertensive medication for elderly hypertensive individuals was followed in detailing the medication therapy. The stepped-care approach consists of the use of (a) a diuretic, (b) a sympathetic depressant, and (c) a vasodilator.

The mono pharmacotherapy group included: (a) 5 participants, who were on a diuretic only; (b) 2 participants, who were receiving a sympathetic depressant;

and (c) 2 participants, who were receiving a vasodilator. The other 10 participants were on multiple pharmacotherapy that ranged from 2 to 3 medications for their hypertension. The multiple pharmacotherapy group included: (a) 4 participants, each of whom was receiving a diuretic and a vasodilator; (b) 3 participants, each of whom was receiving a diuretic, a sympathetic depressant, and a vasodilator; (c) 2 participants, each of whom was receiving a sympathetic depressant and a vasodilator; and (d) 1 participant, who was receiving 3 different types of vasodilators.

Medications for Other Medical Problems

The number of daily prescribed medications, including the hypertensive medication, for the participants ranged from 1 to 11 prescriptions with a mean of 4 prescriptions for each participant. Three (14%) participants were not being medically treated for any diseases other than hypertension, while the other 18 (86%) were being treated for a variety of other diseases. A total of 14 disorders were being treated by prescribed medications. Ten (48%) of the hypertensive elderly individuals were being treated for cardiac problems. Arthritis medications were prescribed for 8 (38%) of the participants.

Besides coronary diseases and arthritis, there were 12 other diseases for which the participants were receiving medications. The number and percentage of participants with the following disorders were (a) 3 (14%) with thyroid

disorder, (b) 3 (14%) with anxiety, (c) 3 (14%) with pulmonary disease, (d) 2 (10%) with eye disease, (e) 2 (10%) with estrogen replacement needs, (f) 2 (10%) with gastro-intestinal disturbance, (g) 1 with leg cramps, (h) 1 with a seizure disorders, (i) 1 with anemia (j) 1 with a skin disorder, (k) 1 with a urinary tract infection, and (l) 1 with hypercholesteremia.

Research Question #1

In order to determine if a blood pressure monitoring program was effective for elderly hypertensive individuals, two research questions were asked. The first research question was: Is there a significant difference between the written pretest scores on the Self-Reporting Adherence Scale (SRAS) before the implementation of the blood pressure monitoring program and the posttest scores at the completion of the program of regularly attending elderly hypertensive individuals?

Indirect Measurement Results

The SRAS was the indirect method of measurement of blood pressure control. A pretest SRAS was administered before the blood pressure monitoring program, and a posttest SRAS was administered at the completion of the program. The pretest scores of the SRAS were calculated for a difference with the posttest scores of the SRAS. The total scores of the pretest and posttest were determined by the summation of the number codes of the SRAS Likert scale that ranged from

never (1) to always (5) for each question. Since there were 8 questions, the scores could range from 8 to 40. Only the questions that were answered in both the pretest and the posttest were included in the summation of the scores. Thirteen (62%) participants did not respond to question C, and 1 participant did not respond to question G in the pretest or posttest or both. Those responses were not calculated in the total summation of the individual SRAS scores of the respondents.

After the total scores were determined, the SRAS scores were analyzed by the utilization of the sign test. The difference in score between the pretest and posttest was determined by a plus or minus sign, with a plus sign indicating an improvement in the posttest scores test over the pretest scores. The results indicated that there were 11 plus signs and 3 minus signs. The other 7 scores were zero, and those scores were eliminated. Because of the zeros, the sample size was reduced to 14 for determination of the critical value. See Table 1 for the sign test scores of each participant.

In order to determine an associated probability with the sign test results, the total number of plus signs ($n = 11$) and the total number of minus signs ($n = 3$) as the observed frequency were compared to a chi square distribution. The expected frequency was 7, since the sample size was reduced to 14 by the sign test. The

Table 1

Sign Test Scores From the Self-Reporting Adherence Scale (SRAS) of Respondents (N=21)

	SRAS		
Respondent	Pretest	Posttest	Sign of Difference
1	38	37	-
2	29	28	-
3[a]			
4	32	34	+
5	34	34	0
6	32	33	+
7	28	29	+
8	32	34	+
9	26	30	+
10[b]			
11	25	32	+
12	34	34	0
13	35	37	+
14	34	34	0
15	32	33	+
16	31	31	0
17	30	31	+
18	33	34	+
19	36	36	0
20	31	31	0
21	35	32	-
22	35	35	0
23	25	30	+

[a]This respondent did not complete the program.

[b]This respondent did not complete the program.

obtained chi square (1, n = 14) was equal to 3.5, p > .05. There was not a significant difference between the pretest and posttest scores of the SRAS.

Frequency and Percentage Differences

In order to compare the difference in the frequency and percentage of the SRAS responses between the pretest and the posttest, the SRAS was compared item-by-item for the 8 questions (A-H). The total number and percentage of responses for each of the questions that ranged from always (1) to never (5) were calculated from the pretest and posttest of the 21 participants. On the posttest, there was a slight (6%) increase on the combined percentage of the two most adherent responses (always and most of the time responses) between the pretest and the posttest. On the pretest, the always response was circled 55%, and the most of the time response was circled 23%, while the posttest showed a 56% and a 28%, respectively. The pretest combined percentage of the two most adherent responses was 78%, while the posttest combined percentage was 84%. See Table 2 for the compete list of the responses by number and percentage for all of the questions.

Comparison of Therapy Groups

Since 52% of the participants were receiving mono pharmacotherapy in comparison to the 48% who were receiving multiple pharmacotherapy, an item-by-item comparison was completed for a determination of difference in adherence.

Table 2

Differences by Number and Percentage of the Self-Reporting Adherence Scale (SRAS) of Respondents (N=21)

	SRAS Response	
Response Category	Pretest	Posttest
Never	6 (4%)	1 (.6%)
Seldom	6 (4%)	6 (4%)
Half the time	11 (6%)	6 (4%)
Most of the time	39 (23%)	47 (28%)
Always	92 (55%)	94 (56%)
Not answered	14 (8%)	14 (8%)
Totals	168 (100%)	168 (100%)

Note. Totals indicate number of questions (8) multiplied by respondents (21).

The two therapy groups were compared by total number and percentage of responses in order to compare the difference between the pretest SRAS and the posttest SRAS. The item-by-item comparison of the 8 questions (A-H) was calculated for the mono pharmacotherapy group (n = 11) and the multiple pharmacotherapy group (n = 10).

The pretest results showed that the mono pharmacotherapy group responded with a 79% rate on the pretest on the combined percentage of the two most adherent responses (always and most of the time responses), while the multiple pharmacotherapy group responded with a 74%. On the posttest, the difference was only 1% between the two groups. The mono pharmacotherapy group had a score of 85% on the combined percentage of the two most adherent responses, and the multiple pharmacotherapy group had a scored of 84%.

Research Question #2

Another research question was asked to determine the effectiveness of a blood pressure monitoring program for elderly hypertensive individuals. The second question of the study was: Is there a significant difference between the recorded blood pressure readings before the implementation of a blood pressure monitoring program and the recorded blood pressure readings at the completion of the monitoring program of regularly attending elderly hypertensive individuals?

Physiological Measurement Results

The blood pressure reading was the physiological method of measuring the effects of the blood pressure monitoring program. In order to determine the effects of the program, a test for difference was calculated between the blood pressure readings that were taken before the program was started and the readings after the completion of the program. The mean was calculated for the systolic blood pressure (SBP) and the diastolic blood pressure (DBP) of the pre readings and of the post readings.

The mean SBP reading before the program was started was 157 mm\Hg with a range of 120-210 mm\Hg. The mean SBP reading after the completion of the program was 144 mm\Hg with a range of 108-200 mm\Hg. The mean DBP reading before and after the program was 82 mm\Hg with a range of 60-110 mm\Hg and 75 mm\Hg with a range of 60-90 mm\Hg, respectively. A two-tailed dependent t-test indicated that there was a significant difference of both the SBP ($t = 5.14$, $df = 20$, $p < .005$) and the DBP ($t = 2.93$, $df = 20$, $p < .005$) between the pre readings and the post readings (Table 3).

Therapy Groups Mean Change Comparison

The two medication therapy groups were also compared for significant differences between the blood pressure readings that were taken prior to the program and the readings that were taken at the completion of program. The

Table 3

Difference Between Blood Pressure Measurements Before and After the Program (N=21)

Variables	Program	
	Before	After
Systolic Blood Pressure (SBP)		
Mean (SD)	157 mm/Hg (26)	144 mm/Hg (21)
Range	120-210 mm/Hg	108-200 mm/Hg
Diastolic Blood Pressure (DBP)		
Mean (SD)	82 mm/Hg (11)	75 mm/Hg (9)
Range	60-110 mm/Hg	60-90 mm/Hg

Note. $p < .005$, two-tailed dependent t test ($t = 5.138$ and $t = 2.93$, respectively, $df = 20$).

mono pharmacotherapy group (n = 11) and the multiple pharmacotherapy group (n = 10) were compared to determine if there was a difference in the mean change of the SBP readings and the DBP readings between the groups.

The mono pharmacotherapy group before the implementation of the program had a mean SBP reading of 157 mm\Hg (SD = 31) and a range of 120-210 mm\Hg compared to a mean of 159 mm\Hg (SD = 22) and a range of 128-190 mm\Hg for the multiple pharmacotherapy group. The SBP readings of the mono pharmacotherapy group after the completion of the program showed a mean of 145 mm\Hg (SD = 25) and a range of 108-200 mm\Hg while the multiple pharmacotherapy group showed a mean of 143 mm\Hg (SD = 18) and a range of 120-168 mm\Hg.

When comparing the DBP readings before the program was started, the mono pharmacotherapy group had a mean reading of 81 mm\Hg (SD = 11), with a range of 60-96 mm\Hg. In comparison, the multiple pharmacotherapy group had a mean of 83 mm\Hg (SD = 12), with a range of 70-110 mm\Hg. After the program was completed, the DBP of the mono pharmacotherapy group had a mean reading of 75 mm\Hg (SD = 8), with a range of 60-88 mm\Hg, while the other group showed a mean of 75 mm\Hg (SD = 11), with a range of 60-90 mm\Hg.

A mean change (mean change = pre readings - post readings) was calculated for the readings of the SBP and the DBP of the pharmacotherapy groups. The mono pharmacotherapy

group mean change of the SBP was 12 mm\Hg (SD = 13), while the DBP mean change was 5 mm\Hg (SD = 11). In comparison, the multiple pharmacotherapy group had a SBP mean change of 15 mm\Hg (SD = 10), while the DBP mean change was 12 mm\Hg (SD = 8). An independent *t*-test was utilized with the mean change of the SBP and the DBP in order to determine if there was a difference between the two groups. There was not a significant difference at the .05 level between the two groups in either the SBP mean change reading (*t* = .608, *df* = 19) or the DBP mean change reading (*t* = 1.17, *df* = 19).

Descriptive Analysis of Elevated Readings

The mean and range of the blood pressure readings before the monitoring program was started, as well as the mean and range of the readings after the program was completed, have already been discussed for all of the participants. However, the blood pressure readings that were taken prior to the start of the blood pressure program indicated that 11 (52%) of the participants' measurements were elevated readings. A blood pressure was considered elevated if the SBP was equal to or higher than 160 mm\Hg and\or if the DBP was equal to or higher than 90 mm\Hg. At the start of the program, the mean and range of the elevated SBP readings were 177 mm\Hg and 150-208 mm\Hg, respectively. In order, the DBP mean and range were 90 mm\Hg and 80-110 mm\Hg. At the completion of the program, the 52% who had elevated readings had a SBP mean and range reading of 158

mm\Hg and 138-200 mm\Hg, while the DBP mean and range was 75 mm\Hg and 60-90 mm\Hg, respectively. Besides having a decrease in the mean and range of the SDP and DBP readings, the number was reduced to 7 (33%) participants with blood pressure readings in the elevated range at the completion of the program.

The elevated blood pressure readings were also compared between the two medication therapy groups. Six (55%) of the mono pharmacotherapy group (n = 11) had elevated blood pressure readings prior to the program, and 3 (27%) remained elevated after the program. In comparison, the multiple pharmacotherapy group (n = 10) had 5 (50%) elevated readings before the program and 4 (40%) remained elevated after the program.

Chapter 5

CONCLUSIONS AND RECOMMENDATIONS

Conclusions of the study are presented in this chapter based on the analysis of the data. Influencing factors are included to assist with interpretation of the findings. Recommendations for future research and implications of the study are also presented.

Conclusions

In answer to the first research question, the study found that there was no significant difference at the .05 level between the pretest and the posttest of the Self-Reporting Adherence Scale (SRAS) of elderly hypertensive individuals who regularly attended a 3 month blood pressure monitoring program. However, in answer to the second research question, there was a significant difference ($p < .005$) between the blood pressure readings that were taken before the initiation of the blood pressure monitoring program and the readings at the completion of the program. Even though there was not a significant difference between the pretest and posttest SRAS, the significant difference in the blood pressure readings at the completion of the program indicated that the blood pressure program was effective in assisting elderly hypertensive individuals with blood pressure control. Because of the small sample size

(N = 21), it would be difficult to generalize the findings to all elderly hypertensive individuals.

An item-by-item comparison of the SRAS was also done to determine a percentage comparison of self-reported adherence between the pretest and the posttest. In the pretest, 78% of all of the responses circled were the most adherent responses (always and most of the time). In the posttest, 84% of the pretest responses were the most adherent responses. Even though 78% of the pretest responses indicated that many of the elderly hypertensive individuals were adherent to most of the recommended treatments, 11 (52%) of the participants prior to the program had elevated blood pressure readings. An elevated reading was indicative if the systolic blood pressure (SBP) was equal to or greater than 160 mm\Hg and\or if the diastolic blood pressure (DBP) was equal to or greater than 90 mm\Hg. At the completion of the program, 7 (33%) participants had an elevated reading. However, the mean and range of the elevated readings were less than the mean and range of the readings before the program was started.

Bandini (1981) also found in a study with hypertensive elderly individuals that 51% of the participants (N = 45) had blood pressure readings that were elevated. Bandini was testing the effects of lack of knowledge as being related to the failure of elderly hypertensive individuals to follow recommended treatments for hypertension. However, in

comparison to this present study, the elderly individuals self-reported that they were following recommended treatments, but it is true that the percentage of elevated blood pressure readings decreased after reinforcement of recommended treatments which may have increased their knowledge.

Because studies have shown that adherence to treatments is enhanced with a simplification of medication therapy, this research study also examined the participants (N = 21) as being part of two medication therapy groups. One group (n = 11) was receiving only 1 antihypertensive medication (mono pharmacotherapy) while the other group (n = 10) was receiving 2 to 3 antihypertensive medications (multiple pharmacotherapy). There was no significant difference ($p > .05$) between the mean change of the blood pressure readings that were taken before the program was started and the readings after the completion of the program between the mono pharmacotherapy group and the multiple pharmacotherapy group.

These two groups showed a high percentage of adherence (mono pharmacotherapy group was 79% and multiple pharmacotherapy group was 74%) in the pretest as well as in the posttest (85% and 84%, respectively). The similar percentages in the pretest and posttest SRAS indicated little difference in adherence to treatments between the groups. This finding does not support the study of Morgan,

Nowson, Murphy, and Snowden (1986). These authors addressed the importance of a simplification of medication therapy in influencing adherence to treatments. Even though the medication group with the simplification of therapy of this present study (mono pharmacotherapy) showed no difference in influencing adherence, the small sample size of the two groups may have been responsible for the lack of agreement with other studies.

The literature shows conflicting results regarding age as being a factor in enhancing adherence to treatments. Bile's (1977) study indicated that elderly individuals were more compliant, but Sands and Holman's (1985) study did not support age as being an influencing factor in enhancing compliance to treatments. The participants in Sands and Holman's study had a mean age of 73 years, while Bile's participants had a mean age of 54 years. The fact that the participants in Sands and Holman's study were older was suggested as the reason for lack of compliance. In this present study, the mean age was 84 years, and adherence to recommended treatments was evident. There was no significant difference between the pretest and the posttest, but the high percentage of responses to the most adherent questions would indicate that the elderly individuals were more compliant.

Influencing Factors

Since there was a significant difference in the blood

pressure readings, there may have been several factors that influenced the change. After three weekly blood pressure readings, those participants who continued to have elevated readings were referred to a primary care provider for an evaluation. Seven (33%) of the participants were referred to their physician, and two of the participants had medication or dosage changes. One refused to go to her physician because she saw a decrease in the reading even though it was still in the elevated range. The other 4 participants had no specific changes made, but they were encouraged by their physician to continue to be monitored and to return for a follow-up visit in 3-6 months. Those who had an elevated reading at the end of the program had lower blood pressure readings than the initial reading.

While it is true that adherence to treatments for diseases does not automatically mean that the disease is under control, adherence can be an factor in keeping the disease under control. Testing for adherence\compliance remains difficult, but it is necessary in order to determine factors that may encourage compliance.

According to LoBiondo-Wood and Haber (1986), respondents may not always answer truthfully on questionnaires, or they may answer as to what is considered socially acceptable. Answering in a way that is socially acceptable may have been a factor in determining the high compliance rate in conjunction with the elevated blood

pressure reading. It is also possible that most of the participants may actually have considered themselves compliant to recommended treatments. The fact that all of these participants have reached an age that surpasses the life expectancy by many years may be an indication of compliance to health treatments most of their life. This fact is another reason that the findings from this study differ with Sands and Holman's (1985) study that concluded that age does not enhance compliance.

Besides age, Ramsey (1982) supports the suggestion that participants in compliance studies have a tendency to be compliant. In a study of 293 hypertensive individuals in a hospital clinic, Ramsey concluded that participants in compliant behavior studies were more inclined to be compliant than those who did not volunteer for compliance studies. Since the findings of this present study indicated that the participants were compliant, the question arises about the degree of compliance of the residents of the retirement home who did not volunteer for the study. Since only 46 of the 100 residents participated in the blood pressure screening (23 of the 46 were eligible to participate in the study), perhaps only those who have a tendency to adhere to treatments volunteered for the study. It is possible, according to Ramsey's study, that the hypertensive individuals of the remaining 54 residents are less compliant than those who volunteered.

Active participation may be another factor. Attending the program, listening to the reinforcement of treatment, and receiving recorded blood pressure readings may have encouraged participants to modify their behavior to a higher degree of compliance. That higher degree of compliance may have been responsible for the lower blood pressure reading. It is possible that the higher degree of compliance could not be measured for a significant difference by the SRAS instrument that was designed for the study.

Social support offered by a health provider and the reinforcement of adequate explanations about treatments has been suggested as reasons for adherence to medical therapy. Gardner and Wheeler (1987) in a study on defining perceptions of social support by patients suggests that social support by nurses can result in effective health care behaviors. Orth, Stiles, Scherwitz, Hennrikus, and Valbona (1987) broadened that possibility in their study on elderly hypertensive individuals that involved health provider explanations in blood pressure control. These authors concluded that explanations about treatment and information concerning the disease of hypertension can promote blood pressure control. Morgan et al. (1986) also found that informed health personnel who can give adequate information about the disease and treatments of hypertension for elderly individuals can influence adherence to treatments.

Recommendations

Conducting a study for 3 months is a short period of time for a disease that is life long and affects a large majority of elderly individuals. Because of the significance of the many diseases that are related to hypertension, more studies should be conducted to determine if elderly individuals can be assisted with controlling the disease of hypertension. While the study showed a significant difference in blood pressure readings of the participants over the 3 month period, more studies need to be conducted. The following recommendations are offered:

1. Design a longitudinal study to determine if there are diminishing effects of the blood pressure monitoring program.

2. Allow for a generalization of the findings by utilizing a larger and randomized sample.

3. Design a study with a control group.

4. Develop or improve the reliability and validity of measurements for testing adherence.

The SRAS instrument was tested for content validity, but there was one question that indicated a problem with validity. Question C was found to have a problems in the pilot study, and with corrections it was thought to be solved, but 13 (62%) participants did not answer the question. It was an *if* question which meant that it only needed to be answered if the situation applied to them. Not

answering the question was not the problem. It was answered by some respondents on the pretest, but not on the posttest, or vice versa. If the question were understood by the respondents, there should have been a response, or no response, to both the pretest and posttest question.

The question deals with the uncomfortable, but time limiting, feeling that may occur when placed on a new antihypertensive prescription. The question was included because noncompliance often occurs because of the initial adverse reaction to some drug therapy. Perhaps, question C ought to be eliminated because it seems to be quizzing more about knowledge instead of compliance to the medication. Also, most (95%) of the participants had been on the same antihypertensive medication for several years, and only one had a medication change during the 3 month time period. This aspect of a newly ordered medication can be included as part of the reinforcement program instead of an adherence question.

Another observation from the study was that elderly individuals do not seem to hesitate answering questions that involve checking an answer or giving brief responses. They did have difficulty in writing their medical problems if it involved more than one disorder. Some had concerns about (a) improper spelling, (b) inability to express the problems correctly, or (c) their hand being too shaky to write. Because of these concerns, questionnaires for elderly

individuals should exclude written responses. Interviews may also be more useful in order to avoid the writing difficulties.

Implications of the Study

While this study showed a significant difference in blood pressure readings between pre and post intervention with the participants of the study, more studies need to be conducted to determine a generalization to the elderly population. However, the implications of the study reflect that there is a need for assistance of elderly hypertensive individuals in the community.

Even with the results of one small setting, the blood pressure monitoring program could be expanded to involve a large number of elderly individuals. Presently, blood pressure screenings are offered at various settings for elderly individuals. The blood pressure readings are measured by a variety of professionals and nonprofessional, and the information that is disseminated to elderly individuals about the disease and treatment varies.

Screenings are conducted at senior citizen centers, retirement facilities, hospital clinics, and other sites. Sometimes the service is free while other times the elderly individual is charged for the service. The blood pressure may be measured by public health nurses, health educators, student nurses, retired nurses and\or nursing assistants, or other paramedical assistants in the community. Sometimes,

the location's convenience is questioned, and there may be inconsistency for frequency of the screenings which makes it difficult for the elderly to routinely schedule a reading.

Because of the variety of settings and personnel measuring the blood pressure, the elderly person may be receiving mixed information about the significance of the reading and the method for controlling the disease. The equipment and method for reading the blood pressure may also vary. Often, the primary health care provider of hypertensive elderly individuals does not recommend these services to the elderly because of the inconsistencies of the method and information provided.

Because of the lack of trust by some primary health care providers regarding the inconsistencies of blood pressure screenings, the elderly individual is often encouraged not to utilize the service. As a result, the elderly hypertensive individual may be asked to return for more frequent follow-up visits to the primary health care provider which could be a burden because of time, transportation, and money for the elderly individual. This added burden could encourage elderly hypertensive individuals to be neglectful in follow-up visits.

Development of a blood pressure monitoring program with protocols and guidelines could help to prevent some of the inconsistencies in blood pressure measuring and teaching interventions. A monitoring program could also develop a

collaboration between primary health care providers and nurses to focus on treatment effectiveness and control of the disease of hypertension. The purpose of preventing the many diseases related to an elevated blood pressure could be accomplished if the disease of hypertension is controlled.

A blood pressure monitoring program could be utilized to assist elderly hypertensive individuals to control hypertension. Based on Orem's (1985) theoretical constructs regarding (a) self-care theory, (b) self-care deficit theory, and (c) nursing systems theory, the nurse is guided in attaining a method to assist elderly hypertensive individuals. The nurse is relating Orem's theories to practice by developing protocols and standardized guidelines for a blood pressure monitoring program for elderly hypertensive individuals in the community setting. In developing a program that assists in controlling a disease that may effect as many as 50% of elderly individuals, the nurse is utilizing a nursing theory in assisting elderly hypertensive individuals in preventing the many related diseases associated with hypertension. The goal of promoting health and preventing disease among elderly individuals can be accomplished by a blood pressure monitoring program.

REFERENCES

References

Armstrong, B. (1987). Protocol: Isolated systolic hypertension in the elderly. Nurse Practitioner, 10(6), 24-32.

Australian National Blood Pressure Study. (1980). Australian therapeutic trial in mild hypertension. The Lancet, 1, 1261-1267.

Bandini, J. (1981). Knowledge about hypertension in affected elderly persons. Journal of Gerontological Nursing, 9, 543-551.

Berglund, G. (1985). Secondary hypertension in the community.In C. J. Bulpitt (Ed.), Handbook of hypertension, Vol. 6:Epidemiology of hypertension (pp. 249-254). New York: Elsevier Science.

Bile, D. (1977). The role of body image in patient compliance and education. Heart & Lung, 6, 143-148.

Borhani, N. O. (1985). Community control of hypertension in the United States. In C. J. Bulpitt (Ed.), Handbook of hypertension, Vol. 6: Epidemiology of hypertension (pp. 359-372). New York: Elsevier Science.

Chang, B., Uman, G., Linn, L., Ware, J., & Kane, R. (1985). Adherence to health care regimens among elderly women. Nursing Research, 34, 27-31.

Davidson, R., & Caranasos, G. (1987). Should the elderly hypertensive be treated? Archives of Internal Medicine, 147, 1933-1937.

European Working Party on High Blood Pressure in the Elderly. (1985). Mortality and morbidity results from the European working party on high blood pressure in the elderly trial. The Lancet, 1, 1349-1354.

Fletcher, S., Fletcher, R., Thomas, D., & Hamann, C. (1979). Patients' understanding of prescribed drugs. Journal of Community Health, 4, 183-189.

Gardner, K., & Wheeler, E. (1987). Patients' perceptions of support. Journal of Nursing Research, 9(1), 115-131.

Gifford, R. (1987). Geriatric hypertension: Chairman's comments on the NIH working group report. Geriatrics, 32(5), 45-50.

Gifford, R., Furberg, C., Ostfeld, A., Perry, H., Schnaper, H., Roccella, E., Bowler, A., & Gillen, F. (1986). Statement on hypertension in the elderly. Journal of the American Medical Association, 256, 70-74.

Gilbert, N. (1981). Statistics. New York: Saunders.

Harper, D. C. (1984). Application of Orem's theoretical constructs to self-care medication behaviors in the elderly. Advances in Nursing Science, 2(4), 29-46.

Hartley, R. M., Velez, R., Morris, R. W., D'Souza, M. F., & Heller, R. F. (1983). Confirming the diagnosis of mild hypertension. British Medical Journal, 286, 287-289.

Hypertension Detection and Follow-up Program Cooperative Group. (1979). Five year findings of the hypertension detection and follow-up program: 11. Mortality by race, sex, and age. Journal of the American Medical Association, 242, 2562-2577.

Joint National Committee on Detection, Evaluation, and Treatment of High Blood Pressure. (1984). The 1984 report of the joint national committee on detection, evaluation, and treatment of high blood pressure. Archives of Internal Medicine, 144, 1045-1057.

Jones, P. K., Jones, S. L., & Katz, J. (1987). Improving follow-up among hypertensive patients using a health belief model intervention. Archives of Internal Medicine, 147, 1557-1560.

Kannel, W. B., Doyle, J. T., Ostfeld, A. M., Jenkins, C. D., Kuller, L., Podell, R., & Stamler, J. (1984). Optimal resources for primary prevention of atherosclerotic diseases. Circulation, 70, 157A-205A.

Kaplan, N. (1986). Clinical hypertension. Baltimore: Williams & Wilkins.

Kerr, J. (1986). Multidimensional health locus of control, adherence, and lowered diastolic blood pressure. Heart & Lung, 15, 87-92.

Lobiondo-Wood, G., & Haber, J. (1986). Nursing research. St. Louis: C. V. Mosby.

Marmot, M. G. (1985). Psychosocial factors and blood pressure. In C. J. Bulpitt (Ed), Handbook of hypertension, Vol 6: Epidemiology of hypertension (pp. 89-103). New York: Elsevier Science.

McClellan, W. M., Hall, W. D., Brogan, D., Miles, C., & Wilber, J. A. (1988). Continuity of care in hypertension. Archives of Internal Medicine, 148, 525-528.

Morgan, T. O., Nowson, C., Murphy, J. & Snowden, R. (1986). Compliance and the elderly hypertensive. Drugs, 31, 174-183.

Morisky, D. E., Levine, D. M., Green, L. W., & Smith, O. R. (1982). Health education program effects on the management of hypertension in the elderly. Archives of Internal Medicine, 142, 1835-1838.

Mosher, M. (1987). Diuretics and alternative drugs in geriatric hypertension. Geriatrics, 42(2), 39-44.

Nursing 89 Drug Handbook. (1989). Springhouse, PA: Springhouse Corporation.

Orem, D. E. (1985). Nursing concepts of practice (3rd ed.). New York: Mc Graw-Hill.

Orth, J. E., Stiles, W. B., Scherwitz, L., Hennrikus, D., & Valbona, C. (1987). Patient exposition and provider explanation in routine interviews and hypertensive patients' blood pressure control. Health Psychology, 6(1), 29-42.

Pender, N. J. (1984). Physiologic response of clients with essential hypertension to progressive muscle relaxation training. Research in Nursing and Health, 7, 197-203.

Pickering , T. G., James, G. D., Boddie, C., Harshfield, G. A., Blank, S., & Laragh, J. H. (1988). How common is white coat hypertension? Journal of the American Medical Association, 259, 225-228.

Ramsey, J. A. (1982). Participants in noncompliance research: Compliant or noncompliant? Medical Care, 20, 615-622.

Sackett, D. L. (1978). Patients and therapies: Getting the two together. New England Journal of Medicine, 298, 278-279.

Sands, D., & Holman, E. (1985). Does knowledge enhance patient compliance? Journal of Gerontological Nursing, 11(4), 23-29.

Schulman, B. A. (1979). Active patient orientation and outcomes in hypertensives treatment. Medical Care,17, 267-279.

Schulman, S. P., & Gerstenblith, G. (1986). Hypertension in the elderly: Treatment. Geriatric Cardiology, 4, 245-252.

Schuyler, W. H., Cormier, W. H., & Bounds, W. G. (1974). Reading statistics and research. New York: Harper & Row.

Souchek, J., Stamler, J., Dyer, A. R., Paul, O., & Lepper, M. (1979). The value of two or three versus a single reading of blood pressure at a first visit. Journal of Chronic Disease, 32, 197-210.

Stanton, A. L. (1987). Determinants of adherence to medical regimens by hypertensive patients. Journal of Behavioral Medicine, 4, 377-394.

Strull, W. M., Lo, B., & Charles, G. (1984). Do patients want to participate in medical decision making? Journal of the American Medical Association, 252, 2990-2994.

Swain, M. A., & Steckel, S. B. (1981). Influencing adherence among hypertensives. Research in Nursing and Health, 4, 213-222.

Whitney, E. N., & Hamilton, E.M.N.(1981). Understanding nutrition (2nd ed.). St Paul: West Publishing.

Wood, G. (1981). Fundamentals of psychology research (3rd ed.). Boston: Little, Brown and Company.

Yoos, L. (1981) Compliance: Ethical considerations. Nurse Practitioner, 10, 27-30.

Young, M. S. (1986). Strategies for improving compliance. Topics in Clinical Nursing, 7(4), 31-38.

APPENDIX A

Self-Reporting Adherence Scale

Please circle one number for each question that best describes your answer. Please be sure to circle ONLY ONE for each question. Thank you!

A. Do you take your blood pressure medicine as it is ordered by your doctor or nurse practitioner?

Never	Seldom	Half the time	Most of the time	Always
1	2	3	4	5

B. Even though you feel well, do you continue to take your blood pressure medicine?

Never	Seldom	Half the time	Most of the time	Always
1	2	3	4	5

C. Sometimes if you feel worse after you take a NEW blood pressure medicine, do you continue to take the medicine?

Never	Seldom	Half the time	Most of the time	Always
1	2	3	4	5

D. Do you get another prescription filled or call your doctor or nurse practitioner BEFORE you run out of the blood pressure pills that you are taking?

Never	Seldom	Half the time	Most of the time	Always
1	2	3	4	5

PLEASE CONTINUE TO THE NEXT PAGE

E. Do you attend scheduled appointments with your doctor or nurse about your high blood pressure?

Never	Seldom	Half the time	Most of the time	Always
1	2	3	4	5

F. Sometimes it is hard to remember to take medicine. How often do you remember to take your blood pressure medicine that is ordered for you?

Never	Seldom	Half the time	Most of the time	Always
1	2	3	4	5

G. If you have been told to avoid certain foods or to change your eating habits to decrease your blood pressure, how often do you follow your instructions?

Never	Seldom	Half the time	Most of the time	Always
1	2	3	4	5

H. If you have been told to take walks or to do some type of exercise because it helps to decrease your blood pressure, how often do you try to do your exercise?

Never	Seldom	Half the time	Most of the time	Always
1	2	3	4	5

PLEASE CONTINUE TO THE NEXT PAGE

Please answer the following questions by checking appropriate answer or filling in blank space. Thank you.

I. What is your age? _____

J. What is your sex? Male___ Female___

K. What is your martial status at this time?

Single___ Married___ Widowed___ Divorced___

L. If you are being treated for medical problems other than high blood pressure, could you please list them.

_____

_____

_____

_____

M. How old were you when your were FIRST treated for high blood pressure? _____**(approximate age)**

THANK YOU FOR TAKING TIME TO ANSWER THESE QUESTIONS!

APPENDIX B

Recommended Treatments Reference

RECOMMENDED TREATMENTS REFERENCE

MEDICATIONS

The Stepped-Care approach consist of the use of a) a diuretic as step one therapy, b) a sympathetic depressant as step two therapy, and c) a vasodilator as step three therapy.

1. Diuretics - volume depleters

A. Thiazide and Related Groups

1) Action: Inhibits sodium and chloride reabsorption in early distal tubule of the cortical diluting segment.

2) Drug Name

(a) Benduoflumethiazide (Naturetin)

(b) Benzthiazide (Aquatag, Exna)

(c) Chlorothiazide (Diuril)

(d) Cyclothiazide (Anhydron)

(e) Hydrochlorothiazide (Esidrix, Hydrodiuril)

(f) Hydroflumethiazide (Saluron)

(g) Polythiazide (Renese)

(h) Trichlormethiazide (Metahydrin, Naqua)

3) Side Effects: Hypokalemia, hypomagnesia, hyperuricemia, hypercalemia, hyperlipidemia, hyponatremia, hyperglycemia

B. Related Sulfonamide Compounds

1) Action: Same as above

2) Drug Name

(a) Chlorthalidone (Hygroton)

(b) Inapamide (Lozol)

(c) Metolazone (Zaroxolyn, Diulo)

(d) Quinethazone (Hydromox)

3) Side Effects: As above except Lozol does not alter serum lipids

C. Loop Diuretics

1) Action: Block chloride reabsorption in the thick ascending limb of Henele's loop and interferes with sodium reabsorption. More rapid onset.

2) Drug Name

(a) Bumetanide (Bumex)

(b) Ethacrynic acid (Edecrin)

(c) Furosemide (Lasix)

3) Side Effects: Similar as thiazides but less likely to cause side effects if given in similar potency dose.

D. Potassium-Sparing Agents

1) Action: Acts in the distal tubule to prevent potassium loss.

2) Drug Name

(a) Amiloride (Midamor)

(b) Spironolactone (Aldactone)

(c) Triamterene (Dyrenium)

(1) Dyazide= 25mg Hctz & 50mg Dyrenium

(2) Maxzide= 50mg Hctz & 75mg Dyrenium

(3) Moduretic= 50mg Htz & 5mg Midamor

(4) Aldactazide= 25mg Htz & 25mg Aldactone

3) Side Effects: Less possibility of altering glucose, lipids and uric acid. A better antihypertensive effect if combined with Htz. Aldactone antagonized by ASA, and some studies show an association with breast Ca. Moduretic may cause hyponatremia in elderly.

2. Sympathetic Depressants - Adrenergic Inhibitors

A. Peripheral Neuronal Inhibitors

1) Action: Interferes with normal release of norepinephrine at the nerve endings to produce an antihypertensive effect.

2) Drug Name

(a) Reserpine (Serpasil, Bonapine)

(b) Guanethidine (Ismelin)

(c) Bethanidine (Tenathan)

3) Side Effects: Postural hypotension, dizziness, CNS depressant and, nasal stuffiness. Reserpine associated with breast Cancer.

B. Central alpha-Angonists

1) Action: Acts upon alpha receptors in the brain stem.

2) Drug Name

(a) Methyldopa (Aldomet)

(b) Clonidine (Catapres)

(c) Guanabenez (Wytensin)

3) Side Effects: If given without a diuretic, fluid

retention occurs except with wytensin. May also produce sedation, decrease alertness, and dry mouth. If stopped abruptly, a rapid rebound of BP may occur.

C. Alpha-Receptor Blockers

1) Action: A reduction in peripheral resistance by blocking the alpha adrenergic receptors on the effector cells.

2) Drug Name

(a) Prozosin (Minipress)

3) Side Effects: May include headache, drowsiness, fatigue, and weakness which can diminish with continued therapy. Does not adversely affect glucose metabolism.

D. Beta- Receptor blockers

1) Action: Blocks the beta adrenergic receptors that lowers BP by reducing sympathetic tone.

2) Drug Name:

(a) Acebutolol (Sectral)

(b) Atenolol (Tenormin)

(c) Metoprolol (Corgard)

(d) Pindolol (Inderal)

(e) Propranolol (Inderal)

(f) Timolol (Blocadren)

3) Side Effects: Numerous side effects that may involve CNS, carbohydrate and lipid metabolism. Impotence, sclerosing syndrome, and discontinuation syndrome. Each drug should be considered individually.

E. Alpha and Beta Receptor Blockers

1) Action: The hemodynamic consequences of the combined alpha and beta blockade are a fall in blood pressure via a fall in both cardiac output and peripheral resistance.

2) Drug Name

(a) Labetalol (Normodyne)

3) Side Effects: Orthostatic hypotension.

3. Vasodilators

A. Direct

1) Action: relaxes smooth muscle which decreases peripheral resistance and blood pressure.

2) Drug Name:

(a) Hydralazine (Apresoline)

(b) Minoxidil (Loniten)

(c) Nitroprusside (Nipride)

(d) Diazoxide (Hyperstat)

(e) Nitroglycerine (Nitrostat)

3) Side Effects: Side effects to be considered with individual drug.

B. Calcium Channel Blockers

1) Action: Inhibit the entry of calcium into smooth muscles and cardiac cells.

2) Drug Name

(a) Diltiazem (Cardizem)

(b) Nifedipine (Procardia)

(c) Verapamil (Calan)

3) Side Effects: Headaches, flushing, local ankle edema, GI disturbance in 15% of users.

C. ACE Inhibitors

1) Action: Inhibits the action of the converting enzyme for angiotensin to prevent the release of renin to lower BP.

2) Drug Name

(a) Catopril (Capoten)

(b) Enalapril (Vasotec)

3) Side Effects: Taste disturbance, rash, proteinuria.

NONDRUG THERAPY

1. Dietary Restrictions

A. Weight Reduction

There is a decrease in blood pressure with even modest amounts of weight reduction.

B. Sodium Restriction

Decreasing sodium may improve effectiveness of antihypertensive drugs. An increase of sodium may completely inactivate the antihypertensive effect of diuretics. A decrease in the sodium by one half or less from the diet can reduce blood pressure by 5 to 10 mm/HG.

Reasons for salt increase in diet of elderly people are:

1) The use of Antacids

2) The decrease perception of taste for salt may increase the desire to add more.

3) Some injectable antibiotics have sodium concentrations.

4) Habit in using salt shaker.

5) Use of pre-packaged and processed foods.

Assistance that can be offered to encourage restriction of salt in the diet is:

1) Decrease use of processed foods.

2) Assurance that preference for salt will decrease after a few months.

3) Do not try to eliminate salt intake from diet immediately, but to start gradually.

4) Sodium substitutes (Morton lite salt) or losalt (Co-salt) is available.

5) Substitute potassium for salt, but caution must be exercised if taking a potassium sparing diuretic.

6) Provide fliers for foods high in sodium and foods low on sodium.

C. Increase Fiber

Some evidence exists that fiber has an antihypertensive effect. Provide fliers for foods high in fiber.

D. Decrease Fat in Diet

Fats, especially saturated forms, can help to lower blood pressure. Decreasing cholesterol will help to

decrease other risks for heart disease. Provide fliers for foods high in saturated fats and cholesterol.

E. Caffeine

Some researchers agree that some people may have a sensitivity to caffeine that causes a rise in blood pressure.

F. Alcohol

Some reports show that 2 ounces a day is safe, but more consumption of alcohol may increase blood pressure.

2. Exercise

Blood pressure can be reduced with a regular pattern of exercise - walking is sufficient. Exercise will also assist with weight control. Avoid isometric, pushing, pulling, or lifting since it may cause an increase in blood pressure.

3. Follow-up Visits

Follow-up visits to the primary health care provider are necessary at least once every six months. Some may be advised every three months or more if the blood pressure is difficult to control.

Follow-up visits to the nurse should be once a month. if the blood pressure is equal to and\or greater than 160\90 mm\HG, then three weekly visits are advised. A referral by phone will be encouraged if the blood pressure remains elevated. If the systolic blood pressure is equal to and\or greater than 180 mm\Hg times two, and\or if the diastolic is

equal to and\or greater than 100 mm\Hg times two, then a referral will be made to the primary health care provider. If signs or symptoms of adverse reactions or if ineffective reactions occur, a referral will also be made. The hypertensive elderly individual will be advised to call the primary health provider in order to encourage independence, but if assistance is needed, it will be given.

The blood pressure card will be kept by the elderly hypertensive individual with the recorded blood pressures. Sharing the recorded blood pressures with the primary health care provider will be encouraged. A collaborative relationship is encouraged between the monitoring nurse and primary health care provider to assist the elderly hypertensive individual to control the disease of hypertension. If a medication change is made by the primary health care provider, the nurse will be available to assist with monitoring the blood pressure for effectiveness as well as to be aware of side reactions. The blood pressure monitoring program can assist the elderly hypertensive individual by lessening the number of appointments to the primary health care provider. If appointments are less frequent, than Medicare fees and personal health expenses will also be less.

Bibliography

Kaplan, N. (1986). Clinical hypertension. Baltimore: Williams & Wilkins.

Nursing 89 drug Handbook. (1989). Springhouse, PA: Springhouse Corporation.

Schulman, S. P., & Gerstenblith, G. (1986). Hypertension in the elderly: Treatment. Geriatric Cardiology. 4, 245-252.

Whitney, E. N., & Hamilton, E. M. N. (1981). Understanding nutrition (2nd ed.). St Paul: West Publishing.

APPENDIX C

Reinforcement Checklist

REINFORCEMENT CHECKLIST

Name/No._____ Medication_____

Referrals: Date & Where _____

Date of R.						
BP						
DIET						
Sodium						
Cholesterol						
Alcohol						
Caffeine						
Weight						
EXERCISE						
Walk						
_____						
MEDICATION						
Take as						
ordered						
FOLLOW-UP VISIT						
Know Date						
RN						
MD						

Codes: N/A=not applicable,R=reinforcement,BP=blood pressure

APPENDIX D

Blood Pressure Measuring Guidelines

Blood Pressure Measuring Guidelines

The following guidelines are excerpted from Kaplan (1986).

1. Arm and position

Support arm and position it at the level of the heart.

2. Sphygmomanometer

a) Cuff

Use a cuff that fits the arm. For most adults a cuff with a bladder that is 12x23cm is sufficient. If arm circumference is greater than 41cm, a 15x33cm is necessary. Place cuff over brachial artery with lower edge of cuff 2.5cm above the antecubital space.

b) Manometer

The mercury manometer is less likely to be in error. The reservoir should be full and the meniscus should read zero when no pressure is applied. When pressure is applied, the column should move freely.

3. Technique

After measuring a palpable systolic pressure, inflation of the cuff should be rapid to 20 mm\Hg above systolic pressure. Deflation rate should be 2-3 mm\Hg per second. May be repeated in 15 seconds. The systolic reading is the level of the first audible sound, and the diastolic reading is at the point of the disappearance of the sound. If sound is heard well below the expected diastolic sound, and the stethoscope is not being held too tightly, the point of the

muffled sound should be considered as the diastolic pressure. If arrhythmias are present, repeated measurements are necessary for an estimated average systolic and diastolic pressure.

4. Precautions

Three readings at each visit should be done. The mean of the three readings is the blood pressure status.

b) Be aware of extraneous factors that may alter pressure including:

1) Recent smoking or eating

2) Anxiety

3) Talking

4) Exertion

5) Cold

6) Medications such as estrogens, adrenal steroids, adrenergic nose drops or eye drops

7) Bladder distension

5. Hints to improve sounds

If sounds are difficult to hear, be sure placement over the brachial artery is correct. Raising the arm for a few seconds before inflating the bladder and\ or opening and closing the hand ten times may be helpful.

Source: Kaplan, M. (1986). Clinical hypertension. Baltimore: Williams & Wilkins.

APPENDIX E

Blood Pressure Card

COPY OF OPEN BLOOD PRESSURE CARD

DATE	PRESSURE	DATE	PRESSURE	DATE	PRESSURE
4-8-89	136/82				
5-8-89	140/80				

FRONT OF FOLDED BLOOD PRESSURE CARD

Blood Pressure Card

Jane Doe

Monitored by

Carol Michnowicz RN

APPENDIX F

Permission Letter

Carol Michnowicz, RN
2749 Glorietta Circle
Santa Clara, CA 95051
May 1, 1989

Residence Director

Dear Mrs Ryan:

Thank you for seeing me last month and discussing my opportunity of starting weekly blood pressure screenings with the residents. While performing this community project, as I have already mentioned to you, I will be able to have contact with elderly people to complete my thesis for Master of Science Degree in Community Health Nursing at San Jose State University.

The objective of my thesis is to evaluate a method of blood pressure monitoring in assisting elderly people with hypertension. The data collection involves a ten minute written pretest questionnaire on compliance to be completed by residents who are randomly selected as well as recording of their blood pressure. After a three month period, a written posttest will be given for further evaluation. Confidentiality of the residents will be maintained and written permission will be granted from participating residents.

This proposal is required to be reviewed by San Jose State University Committee for the Protection of Human Subjects. In order to meet the requirements of the committee, I need permission from you for conducting my research at the retirement community.

Thank you for your assistance, and I will be happy to share results of this study with you at your request.

Sincerely,

Carol Michnowicz

Carol Michnowicz RN

Permission granted for blood pressure screening and data collection as described.

Director _____ Date 5-5-89

cc: Research proposal

APPENDIX G

Consent Form

Agreement to Participate in San Jose State University Research

Responsible Investigator: Carol Michnowicz, RN, BSN

Title of Protocol: A Study of a Method of Blood Pressure Monitoring for Elderly Hypertensives

I have been asked to participate in a research study that is investigating high blood pressure of elderly people. The results of this study will help us to better understand if a method of blood pressure monitoring may assist in controlling hypertension in elderly people.

I understand that:

1) At the start and at the completion of this study, I will be asked to answer questions on a written survey by circling numbers. I also agree to have my blood pressure measured and attend a blood pressure screening at _____ _____.

2) There are no identified physical or emotional risks.

3) The possible benefits of this study to me are three months of blood pressure screenings and a card for recording the reading.

4) The results of this study may be published, but any information from this study that can be identified with me will remain confidential and will be disclosed only with my permission as required by law.

5) Any questions about my participation in this study will be answered by Carol Michnowicz, RN, BSN (408) 244-8429. Present procedure complaints to Elizabeth O. Dietz, Ed.D., FNP, (408) 924-3172. For question and complaints about research subjects' rights, contact Serena Stanford, Ph.D. (Associate Academic Vice President for Graduate Studies and Research) (408) 924-2480.

6) My consent is given voluntarily without being coerced: I may refuse to participate in this study or in any part of this study, and I may withdraw at any time, without prejudice to my relations with SJSU and _____ Retirement Home.

7) I have received a copy of this consent form for my file.

I HAVE MADE A DECISION WHETHER OR NOT TO PARTICIPATE. MY SIGNATURE INDICATES THAT I HAVE READ THE INFORMATION PROVIDED ABOVE AND THAT I HAVE DECIDED TO PARTICIPATE.

DATE: _____ SUBJECT'S SIGNATURE:_____

DATE: _____ INVESTIGATOR'S SIGNATURE:_____

APPENDIX H

SJSU Human Subjects Institutional Review Board Approval

SJSU SAN JOSE STATE UNIVERSITY

Office of the Academic Vice President • Associate Academic Vice President • Graduate Studies and Research
One Washington Square • San Jose, California 95192-0025 • 408/924-2480

June 13, 1989

Ms. Carol Michnowicz
2749 Glorietta Circle
Santa Clara, CA 95051

Dear Ms. Michnowicz:

Your human subjects protocol number 7512 has received final approval. Attached is a copy of the final approval form with the signature of the Chairman of the Human Subjects Institutional Review Board and my approval.

The Human Subjects Institutional Review Board must be notified in writing of any changes to this approved protocol, and approval must be granted in writing before any change is instituted.

Congratulations and good luck with your research!

Sincerely,

Serena Stanford

Serena Stanford, Ph.D.
AAVP for Graduate Studies & Research

Attachment