AN EVALUATION: MEDICATION USE BY PARTICIPANTS

OF URBAN AND RURAL NUTRITION SITES

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A THESIS

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TABLE OF CONTENTS

CHAPTER

DEDICATION

This paper is lovingly dedicated to my
mother and father,
Mr. and Mrs. Eddie Gauthier,
whose love, encouragement, and support
inspired this accomplishment.

LIST OF TABLES

Table

vii

Table

LIST OF FIGURES

Figure

ix

CHAPTER 1

INTRODUCTION

Over the past four decades, modern technological advancement in the health sciences has made possible extension of average life spans for all persons in the United States. Thus, population of elderly persons is increasing steadily. Presently there are approximately 24 million persons 60 years of age and over in the United States, which is equivalent to 10% of the total population. Projections are that by the year 2000, the elderly will comprise 25% of the total population--an approximate total of 48 million!

This rapidly growing number of elderly persons in the population directly accounts for the increasing prevalence of chronic illnesses. These illnesses often necessitate the therapeutic use of many new and extremely potent medications. Due to the development of these highly effective drug therapies and to the evolution of the general hospital as a predominantly acute treatment center, more persons than ever before are being given the responsibility of their own care at home. As a result, health care providers increasingly are concerned about the extent to which persons have become involved in self-care. Of great

1

significance here is the fact that approximately 95% of the elderly population is noninstitutionalized. Most of these persons are responsible for varying degrees of participation in their own health care, which usually includes self-medication.

It has been found that the elderly population today is the most prescribed-to group of consumers in the United States. The fact that many of these persons are not adhering to their prescribed medical regimens is difficult to ignore. Because the optimum effectiveness of drug therapy is dependent upon accurate compliance, it is imperative for health professionals to examine the knowledge of the elderly about wise drug use practices. With a greater knowledge and understanding of the importance of careful, wise drug use, the elderly will be able to obtain and to maintain for themselves an optimum level of wellness. This applied evaluative research study was conducted as a separate part of a cluster study to determine what effect a structured educational program for elderly persons concerning wise medication use would have on the elderly participants' actual medication taking behavior.

Problem of Study

There is a need to know: Does a relationship exist between knowledge about taking medications wisely and

actual medication compliance behavior of a select group of elderly persons who self-administer prescribed medications? How will a specific education program affect medication compliance of this select group? Do specific demographic factors correlate with medication compliance?

Justification of Problem

Because a greater percentage of the elderly population is responsible for the self-administration of medications at home, health care providers are becoming increasingly concerned about their compliance behavior. A review of the literature indicated that many elderly persons fail to comply with physician-prescribed medication regimens (MacDonald, MacDonald, & Phoenix, 1977). Such noncompliant behavior frequently vitiates the time, effort, and money spent on diagnosis and is the direct cause of many hospital admissions (Spector, Cohen, McGrath, Newman, & Uretsky, 1978).

Presently, an increasing number of health care providers are becoming concerned with the concept of preventive health care. By recognizing the importance of wise drug use, facilitated by educational programs, the elderly may experience a decreased incidence of adverse effects from unsafe drug use and will be able to maintain an improved health status.

Professional nurses have the responsibility of promoting high-level wellness among consumers and are commonly found in the most effective positions for consumer education. Through thorough evaluation of a specific educational program, health care providers may gain more insight into the expanding health problem of medication noncompliance and therefore become more effective in reducing its incidence.

Conceptual Framework

The Health Belief Model served as the conceptual framework for this investigation. The Health Belief Model, originally described by I. M. Rosenstock in the 1950s, was formulated to explain preventive health behavior (Becker, 1974). As defined by Kasl and Cobb (1966), health behavior is any activity taken for the purpose of preventing disease or illness by a person who believes himself/herself to be healthy. The conception of the model can be described as an individual existing in a life space composed of regions --some of which are positively valued (positive valence), others of which are negatively valued (negative valence), and still others which are neutral.

Disease or illness in the life space is a region of negative valence that exerts a force moving the person away from that particular region, unless, of course, doing

so requires him/her to enter a region with even greater
negative valence. A person's daily activities are conceived
as a process of being pulled by positive forces and repelled
by negative forces.

A major assumption of the model is that in order for
an individual to take action to avoid disease or illness,
he/she would need to believe the following:

1. That he/she was personally susceptible to illness;

2. That the occurrence of illness would have at least
moderate severity on some aspect of his/her life; and

3. That taking a particular action would in fact be
beneficial by reducing his/her susceptibility to the condi-
tion, or if illness occurs, by reducing its severity, and
that it would not entail overcoming important psychological
barriers such as cost, convenience, pain, or embarrassment
(Rosenstock, 1974).

Individual perception, including perceived susceptibility
to illness or perceived seriousness of illness, acts to
explain the individual's perception of the threat of ill-
ness. Various modifying factors--i.e., (1) demographic
variables such as age, sex, race, (2) sociopsychological
variables such as personality, social class, informal sup-
port system, and (3) structural variables, knowledge about
illness-act to influence the individual's perceptions.

6

Certain cues to action have been described as mass media, education, and illness of family or friend. Although these are cues that may incline an individual to take preventive health measures, the likelihood of action depends upon the sum of perceived benefits of preventive action minus perceived barriers to preventive action.

Will educating the elderly about taking prescribed medications wisely improve their drug compliance behavior? Drug compliance behavior in this study can be viewed as a preventive health measure in avoiding adverse health effects of noncompliance. Ascertaining the elderly's knowledge of wise drug use will enable the researcher to acquire information about the individual's perception of the importance of this behavior.

Within the framework of the Health Belief Model, education is viewed as a cue to action which influences an individual's perception of the benefits of preventive health actions. Therefore, the act of educating the elderly about wise drug use may eventually lead to the elderly person's participation in preventive health measures and also lead to an improved health status of that individual.

Assumptions

For this part of the cluster study, it was assumed that:

1. Prescribed medications for certain elderly persons are necessary for promoting and maintaining an adequate health status among this population.

2. Medication noncompliance is a health problem among the elderly population.

3. Compliance with a specific medication regimen is essential to the elderly person's health.

4. The prescribed drug regimens are appropriate for the condition or illness for which they were prescribed.

5. Knowledge of self-care is important for the elderly person's welfare.

6. Most elderly persons are given some instruction about self-administration of their medications.

Hypotheses

In this part of the cluster study, the hypotheses tested were:

1. A structured educational program will improve the participants' knowledge about wise medication use.

2. Knowledge about aspects of correct medication-taking behavior is positively associated with medication compliance.

3. Selected demographic variables such as age, educational background, number of illnesses, and number of prescribed medications are associated with medication compliance.

Definition of Terms

The following terms are defined for use in this part of the cluster study:

1. Cluster study--a study conducted by several researchers on different samples, using identical research design content, instruments, and oral introductions.

2. Elder-Ed program--a program for senior citizens sponsored and funded by the Department of Health, Education, and Welfare to encourage wise use of prescription medications (National Institute, 1979). This program consists of:

    a. a 30-minute film (National Institute, n.d.) with major topics covered being:

        Communicating with physicians

        Buying drugs wisely

        Taking drugs carefully

        Focusing on healthy aging

    b. Written materials to support the film, including these pamphlets (Appendix A):

        "Passport to Good Health Care"

        "Saving Money with Generic Medicines: Can You? Should You?"

        "Do's and Don'ts of Wise Drug Use"

        "Using Your Medicines Wisely: A Guide for the Elderly"

        "Keeping Track of Your Medications"

3. Elderly--individuals 60 years of age and over.

4. Knowledge--specific information or facts which the elderly person has about taking medicines correctly.

5. Medication compliance--a measure of the person's accuracy in following a prescribed medication regimen. In this study, it will be noted as:

    a. Accurate pill count

    b. Accurate answers on questionnaire regarding self-reporting of compliance behavior.

6. Medication noncompliance--a measure of the person's inaccuracy in following a prescribed medication regimen. Noncompliance will be determined if any of the following are identified:

    a. A discrepant pill count

    b. Admission of noncompliant behavior as noted on the self-reporting questionnaire on compliance.

7. Nutrition sites--federally funded sites responsible for providing nutritionally balanced noon meals for those persons 60 years of age and over. The meals are free, donations are accepted.

8. Prescription medications--only those pill form medicines obtainable by a licensed physician or dentist's order.

9. _Rural nutrition site_--that nutrition site which is not within the Standard Metropolitan Statistical Area (SMSA) which includes metropolitan Houston. The Houston-Galveston Area Council (H-GAC) guidelines interpret the site as not being within the accessability of the Houston area.

10. _Self-administration_--the situation existing when the elderly person is entirely responsible for taking his/her own medications.

11. _Urban nutrition site_--that nutrition site which is within the SMSA which includes metropolitan Houston. The H-GAC guidelines interpret the site as being within the accessability of the Houston area.

14. _Wise drug use_--In this part of the cluster study, this term will be used synonymously with medication compliance for a prescribed medication regimen.

Limitations

For the purposes of this part of the cluster study, limitations were as follows:

1. Attrition was expected to occur between the pretest and the posttest period.

2. A small sample size limited generalizability of the findings.

3. A certain degree of forgetfulness may have occurred among the participants, possibly causing inaccurate pill counts and inaccurate answers on the questionnaires.

Summary

Despite the wide recognition and documentation of its prevalence, medication noncompliance among the elderly continues to exist. Many of the elderly population do not understand their medical regimens and for a great number of these persons the resulting errors actively endanger their health.

Recent methods of improving medication compliance have centered on education. Because professional nurses are frequently in the most ideal positions for consumer education, their role in research aimed at improving the elderly person's compliance behavior and subsequently improving his/her overall health status is a vital one in American society.

Chapter 2 presents a review of the literature relevant to this study. Chapter 3 describes the procedure utilized for collecting the study data. Also presented in Chapter 3 is a description of the setting, the population, and sampling technique used to obtain the study sample. Specific statistical techniques used in analyzing the data also are presented in this chapter.

Chapter 4 offers a detailed analysis of all collected data. This includes a complete description of the sample and the findings of the study. Finally, Chapter 5 summarizes the process of this research study. The findings are discussed, conclusions and implications are drawn, and recommendations are made for further study.

CHAPTER 2

REVIEW OF LITERATURE

At 65 years of age, a person moves into another
population statistic column, assumes (or is expected to
assume) a new social role, may retire from employment, and
begins to collect Social Security insurance. Whether or
not he/she feels old, he/she becomes one of the aged
(Anderson, 1971).

Today almost one in ten Americans is 65 years or older.
The great majority of these persons live independently
(Lenhart, 1976). Although generally not as healthy as the
young, most are quite well and functioning and likely to
maintain a state of health until very near the end of their
lives.

However, this geriatric group uses more prescribed
drugs than any other age group. Because of this increased
use of medications, the elderly today are especially prone
to suffer from adverse drug reactions (Lenhart, 1976). But
older people can be among the major beneficiaries of care-
fully used drug therapies, as evidenced by the remarkable
efficacy of drug therapies for congestive heart failure,
Parkinsonism, thyroid dysfunction, and many other diseases
that are common to the elderly.

This chapter reviews literature concerning the aging process itself--the biological, sociological and psychological aspects of aging. Some theories and models of aging are presented. Finally, the topic of medication compliance is reviewed with implications for nursing practice presented.

The Aging Process

Biological Aging

Aging can be defined as a certain kind of change in living systems due to the passage of time (Strehler, 1977). According to Bruner (1968), aging as a process begins with conception and ends with death.

Deriving from one fertilized ovum, all cells of an individual are the same chronological age, but their physiological ages are quite different (Rowlatt & Franks, 1973). Some scientists argue that although old age is not an illness in and of itself, there is at least a strong relationship between biological aging and pathology (Kart, 1976). This view simply held that biological deteriorations create a susceptibility to disease and susceptibility to particular diseases leads to death.

Another view proposed at the turn of the century stated that aging is the price cells pay for differentiation. This concept purported that isolated cells growing outside the

constraints of a highly complex organism (a human being) would be able to live forever. Alexis Corral performed his research on chick heart cells and his findings supported this theory (Cristofalo & Stanulis, 1978).

Further studies have revealed a strong intimation that aging may be a special characteristic of highly differentiated cells (Rowlett & Franks, 1973). All cells within an individual have a built-in programmed lifespan that varies with the lifespan of the species, but which may be modified by extrinsic factors. In aging, the critical cells would seem to be those that are so highly developed or differentiated that they can no longer divide (Birren, 1964).

Research conducted in the last 20 years has discovered that cells from a variety of normal human tissues would proliferate in cultures for various periods of time but eventually would degenerate and die. Hayflick and Moorhead (1961) found that the average population doublings among lung cells--before senescence--was 50 for cells derived from fetal lung and 20 for cells derived from adult lung. These same researchers performed experiments to demonstrate that all strains of cells grow and continue to divide until they achieve the average number of doublings characteristic of that particular strain.

Observations made in 1970 by George Martin and co-workers at the University of Washington in Seattle confirmed Hayflick's observations that the life span of cells in culture is inversely proportional to the age of the doner. This suggests that aging might result from the cells declining in proliferative ability (Harrison, 1978).

A favored explanation of cell death is that with time, damage occurs to the nucleic acids of the cell chromosomes, which are the ultimate controls over the function and structure of the cell. Because of the damage to the deoxyribonucleic acids (DNA) of the chromosome, defective messenger molecules, ribonucleic acids (RNA), are produced that may be unable to synthesize the necessary enzymes for maintaining cell function. These cells then would presumably die (Birren, 1964). Wallach and Gershon (1974) observed changes in aging nematode cells associated with incorrect messenger RNA translation.

A very interesting discovery was made concerning the concept of built-in "time clocks." Certain kinds of animal cells have what might be thought of as biological "time clocks." These "clocks" function as if by counting off the amount of life already lived and programming the time still left (Botwinick, 1978). However, contrary to the idea of a single, central controlling clock of aging is

the concept of increasing disorganization with age of the vital systems of the body. In other words, the organism dies of old age because it is an unstable system provided with no further sequence of operational instructions, and in which divergent processes are no longer coordinated to maintain necessary function (Comfort, 1956).

Research conducted by Rockstein (1958) offered strong evidence in support of the concept of a genetic basis of longevity. Strehler (1977) defined genetic processes as determinate processes which occur with certainty in all animals of a given species regardless of their environment and/or experiences. A strong line of evidence favoring the inheritance of longevity consists of a series of documented vital statistics on human life spans that suggest longevity is a characteristic of certain families (Rockstein, 1958). Comfort (1956) stated that the age of the mother in certain cases is known to modify the longevity of her offspring. Some biologists have said that if you want to live long, choose long-lived parents. One major study conducted in 1918 by Alexander Graham Bell reported the longevities of 4,000 descendents of one family in relation to age of parents at death. The data suggested some correlation between age at death of parents and age at death of off-spring. The recent evidence, however, is sparce for this position (Botwinick, 1978).

The genetic causes of aging are presented clearly by Strehler (1977). These causes are divided into two major changes--cellular property changes and supracellular changes. However, Strehler stated that it is possible to classify the kinds of changes leading to the decreased functional capacity of living systems into two major processes: (1) determinate processes (genetic), and (2) stochastic processes, those processes which are the results of unpredictable environmental influences (see Figures 1 and 2). These stochastic causes of aging are divided into two broad categories--macroaccidents and micro-accidents. Macroaccidents are described as physical agents such as bacterial infections, heat, cold, and so forth, and chemical agents such as nutrition, anoxia, and toxic substances. Microaccidents result from disruptions of molecular structure because of locally high concentrations of energy arising from physical agents, i.e., local heat fluctuations and absorption of radiant energy, and chemical agents such as heat liberated locally as a result of chemi-cal reactions (Strehler, 1977).

Temperature was mentioned as a physical agent under both the macro- and microaccidental causes of aging. Bourliere (1958) reported that since the rate of energy consumption is related to factors of temperature, one

A. Macroaccidents

Physical agents   Chemical agents

Bacterial   Heat,   Radiation   Nutrition   Anoxia   Toxic
infections   cold,   sub-
               cuts,   stances
               bruises,
               breaks,
               burns,
               freezing,
               wear and
               tear

B. Microaccidents (such as mutations, denaturation)
   which result from disruptions of molecular struc-
   ture because of locally high concentrations of
   energy arising from

Physical agents   Chemical agents

Statistical   Absorption of   Heat liberated locally as
local heat   radiant energy   a result of energetic
fluctuations   or high-energy   chemical reactions
                 particles

Figure 1. Stochastic causes of aging.

Source: Strehler, 1977, p. 20.

A. Changes in Cellular Properties

Physical | Chemical

Size (surface/volume) | Viscosity | Differentiation | Size limitations | Accumulation of side products or destruction of cellular constituents

Loss of plasticity | Chemical overspecialization | Growth cessation | Errors in catalysis

Loss of ability to replace parts | Uncatalyzed reactions

Loss of ability to replace sub-cellular elements | Loss of ability to differentiate into replacement cells

due to

Loss of code | Loss of readout device | Loss of conditions for readout

Figure 2. Genetic causes of aging.

Source: Strehler, 1977, p. 21.

hypothesis would be that heat makes for high metabolism
and short life. He also concluded that temperature, both
environmental for cold-blooded species and central for
warm-blooded animals, has something to do with the rate of
the aging process.

The Psychology of Aging

A great many "non-old" Americans would probably agree
with Puddinhead Wilson that "it is better to be a young
June-bug than an old bird of Paradise" (Trippitt, 1980).
The American worship of youthfulness may at first seem vain
and essentially harmless. However, it has caused a sort of
aversion to aging with a tendency to look askance at and
often down on older persons.

Eric Erikson (1963) stated that the developmental
task of the mature years is ego integrity versus despair.
The attainment of this task is very difficult for many
elderly persons (Murray & Zentner, 1975). Ego integrity
refers to the coming together of all previous phases of the
life cycle. Without this sense of ego integrity, the
elderly person feels a sense of despair and self-disgust.
Such feelings are enhanced further by society's emphasis
on youth and mandatory retirement (Murray & Zentner, 1975).

Erikson contended that good adjustment in this stage
follows only after important matters have been arranged and

when the successes and failures of life have been seen as inevitable. Good adjustment in later life indicates a kind of fatalism, an acceptance of the order in life, where even death is looked at without agony (Erikson, 1963).

But how are these important matters arranged to facilitate successful adjustment during this stage of development? Butler (1975) referred to a "Life Review." Older people often reminisce, dwelling on the past. According to Butler, this is purposive, occurring naturally so that unresolved conflicts are brought into the focus of attention where they can be resolved. Impending death makes the Life Review necessary, for little time remains to arrange one's affairs. Butler indicated that in mild form the Life Review is a reminiscence that makes for nostalgia and, occasionally, mild regret. However, in severe form, anxiety and depression may result. A failure of the Life Review to resolve a person's conflicts makes self-acceptance very difficult.

The older person is capable of changes in behavior, but the changing is not easy. New types of ego defenses may be needed as new crises develop from social, economic and/or family restructuring. At this same time, the need to change may interfere with developing a sense of ego integrity (Murray & Zentner, 1975).

Cognitive functioning has been studied as a psychological factor relating to longevity and survival (Botwinick, 1978). A new study area was created after Kleemeier's 1960 and 1961 (cited by Botwinick, 1978) studies of "terminal drop" in cognitive ability. His studies indicated that those persons whose cognitive abilities declined more rapidly tended to die sooner. This cognitive decline was known as terminal drop. Several later studies performed by Riegel, Riegel, and Meyer (1967) and Baltes, Schaie, and Nardi (1971) supported the concept of terminal drop. From his studies, Reigel (1971) concluded:

> At any time during the later periods of life, subjects who perform less well are likely to be closer to death than their more able age-mates. Differences in scores within age groups might thus be a function of survival probability . . . . Differences in scores between age groups . . . might reflect the increasing number of persons with terminal drop. (p. 146)

Liebermann (1965) studied personality factors as related to terminal drop. Over a period of two and one-half years, he administered four psychological tests every three to four weeks to a group of residents of a home for the aged. His data suggested that persons close to death have a decreased ability to cope with environmental demands; they have a lessened ability to organize and integrate environmental inputs.

These ideas were supported by Birren (1964). He stated that the "individual can be considered as existing in a sea

of sensory stimulation from both within and without"
(Birren, 1964, p. 83). He defined a person's psychological
age as the level of his/her adaptive capacities. The
development of effective perceptual habits of handling
masses of sensory information in large units enhances the
individual's ability to cope with his/her environment.
Birren (1976) stated that there is a fair amount of
research that suggests that individuals do not process as
much information per unit time when they are older as they
did as young adults.

The terms sensory acuity, sensation or sensory
processes are used generally to refer to the ability to be
aware of simple stimuli. Ordinarily, with advancing age
there tends to be a reduction in sensory acuity--influencing
his/her ability to cope and adapt to environmental inputs
(Birren, 1964).

The data from the aforementioned studies suggest that
the average person growing older in America need not expect
to have a "typical" deterioration of mental functioning in
later years. According to Busse and Pfeiffer (1977), the
majority of the elderly population is not senile (i.e.,
defective memory, disoriented). Only about 2% or 3% of
persons 65 years or older are institutionalized as a result
of psychiatric illness. Various community surveys have

found that less than 20% of the aged cannot remember such things as the past president of the United States, their correct age, birth date, telephone number, and so forth (Botwinick, 1978). These data make it clear that the majority of the aged do not have serious memory defects.

The expectations of mental performance must be based upon the individual's characteristics rather than on assumptions about "averages" in the general population. Therefore, the expectation is--given good health and freedom from cerebral vascular disease and senile dementia, individuals can expect high-level mental competence beyond the age of 80 years. From the existing evidence there appears to be no gradual decline with age in general mental ability. The only component of mental performance that seems to change in the majority of persons is that of slowing speed of response (Botwinick, 1978).

Several investigators have shown that with increasing age the brain waves of an individual slow down in frequency. Surwillo (1963) felt that one reason an older person's reaction time is slow and his/her handling of information is slow is due to the slowing in frequency of the alpha brain waves. Woodruff (1972) experimented with small rodents to modify the frequency of brain waves. By appropriate conditioning techniques, she was able to modify

the frequency of the brain waves in older people, thus speeding up their reaction time (Birren, 1976).

Sociological Factors of Aging

A person's early social class and his/her social mobility influence his/her behavior and length of life (Birren, 1964). Although each individual is unique, with certain genetic, psychological and social characteristics, the accumulated effects of his/her social class have an impact upon the way in which he/she ages. Past experience determines responsiveness to new ideas over the life span. It also influences moods, feelings of life satisfaction, and the undertaking of new directions in activities.

There are traces or elements of a person's origin, his/her early family and regional influences, in his/her expectations about growing older. Some factors which are influenced by ethnic and social class differences are child-rearing practices, dietary patterns, recreation and work patterns, exposure to toxic and infectious agents, exposure to information and systematic education, values and religious patterns (Birren, 1964).

Several investigations, including one by Rose (1964) and one by Pfeiffer (1970) indicated that higher education levels, higher status occupations, and higher intelligence all go together and make for favorable longevities.

Pfieffer (1970) made a broad conclusion from his studies:

> Persons with high intelligence, sound financial status, well maintained health, and intact marriages may be expected to live significantly longer than their less intelligent and poor brothers and sisters whose health is also declining and whose marriages are no longer intact. (p. 273)

Lower status roles are associated with factors such as poor housing, poor nutrition, poor sanitation and a variety of other factors important to health and long life (Botwinick, 1978).

Palmore's study (1969) showed that one indicator of longevity was work satisfaction. For men aged 60-69 years, work satisfaction was found to be the best indicator of longevity. This close relationship between work satisfaction and longevity also was noted by Rose (1964). The implication of these studies by Palmore and by Rose is that those elderly persons who are satisfied with their work and who maintain useful roles live longer than those who do not (Botwinick, 1978).

There are recent data suggesting that the loss of a close loved one can cause sufficient stress to actuate the death of another older person. The existing data of this subject were reviewed by Rowland (1977). From these studies, Rowland suggested that:

For some people, especially males, the loss of a
significant other may be detrimental. The risk of
death is highest during the first year of bereave-
ment. (p. 356)

Some data point to bachelorhood or spinsterhood as a

negative factor in survival in later life (Botwinick, 1978).

Pfieffer (1970) indicated that only for women is the "never

married" status negatively associated with longevity.

Rose's data (1964) purported that fewer children also make

for longer life for the parents. The mechanism is such

that fewer children limit the economic and emotional stress

placed upon the parents. A smaller number of children also

may be related to higher socioeconomic status, which, in

turn, has been shown to be related to longevity.

Studies of attitudes toward aging have been conducted

because these attitudes are viewed as critical for adjust-

ment and survival. It is possible that attitudes may con-

tribute to observed maladaptive behaviors among the aged.

Negative views of aging, life in general, and oneself may

result in the elderly person's unwillingness or inability

to seek needed services (Bennett & Eikman, 1973).

An extensive research study, conducted over four years

by Tuckman and Lorge (1956), concerned attitudes toward aging

and the aged. Their results indicated that both young and

old persons look upon old age as a period characterized by

economic insecurity, poor health, loneliness, resistance

to change as well as failing physical and mental powers.

Life can hardly be pleasant if attitudes all around the older person are negative. A different view and a more heartening one has been reported more recently. From this view it appears that perhaps a cultural change is in the process, one that is more favorable to the elderly. Borges and Dutton (1976) questioned a large number of people over an extended age range to rate their own lives in terms of a continuum ranging from "very good" to "very bad." They also asked the subjects to rate the "average person's life," as they saw it, at different age periods. Their results showed that the older respondents rated their lives as better than did the younger respondents when they projected themselves into the future as older persons. Even though most persons over 25 years chose as the "best years" those below their own age, the "best years" were seen to increase with the respondent's own age.

Equally important as attitudes toward aging are the expectations about what older people should do and can do, and about what they ought not to do and cannot do. These arbitrary expectations often are referred to as age norms, age constraints, or age grading (Botwinick, 1978). They

all mean that older people are set in a "mold," often
inhibited from going out and doing publicly what younger
people are permitted to do. According to Neugarten,
Moore, and Lowe (1968) there exists a prescriptive time-
table for ordering behavior; there are social clocks and
social norms. Some examples given by Neugarten et al.
include: "He's too old to be working so hard." "That's
a strange thing for a woman of her age to say." "Act
your age!"

All of these statements imply sanctions; they restrict
and constrain the elderly person. The general expectation
of what an age group member should do helps determine what
the member actually does (Riley, Johnson, & Foner, 1972).
It can keep him/her from activity; it can actually help to
turn a person inward.

Theories of Successful Aging

Presently there are two major contrasting theories of
successful aging. Both may be considered unsatisfactory
because they do not explain all of the phenomena involved in
successful aging, yet both have facts to support their
concepts.

The first theory is known as the "activity theory,"
initially defined by Havighurst (1953). This theory purports
that the American formula for happiness in old age is

"Keep active!" It also implies that except for the inevitable changes in biology and in health, older persons are the same as middle-aged persons with essentially the same psychological and social needs. According to this view, the decreased social interaction of the older person results from withdrawal by society from the aging person. This decrease in interaction occurs against the desires of the majority of elderly men and women. In keeping with this theory, the older person who ages optimally is the one who stays active and who manages to resist shrinkage of his/her social world. One can see the idea of rugged American individualism at work in this theory (Kuypers & Bengston, 1973). The elderly person maintains the activities of middle age as long as possible, finds substitutes for work when forced to retire and substitutes for friends and close loved ones lost by death (Havighurst, 1968).

Maddox and Eisdorfer (1962) conducted a study attempting to support the "activity theory." Activity and morale of persons aged 60-94 years were measured by questionnaires. The final results pointed to a positive relationship between activity and morale. Additional evidence showed that as age increased above 60, activity is likely to decrease without affecting the satisfaction of living.

A survey conducted in Iowa by Pihlblad and McNamara (1965) showed that greater contact with friends was associated with high morale and decreased alienations. Rather than contact with children or other relatives, knowing a great many neighbors, visiting them frequently and phoning others contributed to life satisfaction among the elderly in four Virginia counties (Edwards & Kelmmack, 1973).

Another study was conducted by Lemon, Bengtson, and Peterson (1972). They isolated two central propositions of the activity theory: (1) positive relationship between social activity and life satisfaction in old age, and (2) salient role loss is inversely related to life satisfaction. Their collected data did not support these propositions. Only social activity with friends was in any way related to life satisfaction. Knapp (1977) found that, in a sample of 51 elderly people residing in the South of England, the felt level of life satisfaction was positively related to the person's level of activity. Further research is needed before one can conclude that the maintenance of high activity levels is invariably related to "successful aging."

The second proposed theory of successful aging is known as the "Disengagement Theory," originated by

Cumming and Henry (1961). The theory of disengagement rests on the observation that, in later life, people tend to become withdrawn or dissociated from society. This decreased social interaction is interpreted as a process characterized by mutuality, with the aging individual accepting of the decreased interaction. The most controversial concept of this theory is its purporting that, as a natural and normal process, the disengaged person is the happy person.

From the findings of Cumming's and Henry's 1961 survey in Kansas City over a period of three years, it was believed that the withdrawal from social interaction had an intrinsic, almost biological, basis. This theory proposes that the elderly person becomes more involved with himself and less involved with people and events in the outside world because of his/her own inner needs, not only because society pushes him/her this way. The outward manifestation of social disengagement is primarily a reflection of inner psychological changes. Hochschild (1975) has examined the disengagement theory and critiqued the many research studies performed in the last two decades. Much of the research has been very inconclusive.

Many studies have tested the theory of disengagement and have found it in need of reformation. The idea of

"withdrawal for happiness" was attacked and found wanting (Botwinick, 1978). Lowenthal and Boler (1965) examined a large number of people and categorized them on the basis of voluntary disengagement versus involuntary disengagement. The involuntary disengagement group had low morale, but the voluntary disengaged had high morale.

The disengagement theory has provided much impetus for investigation. Even studies not carried out with disengagement theory foremost in mind have brought to light many important concepts. In summary, the disengagement-happiness relationship is dependent upon the age of the person, his/ her physical and mental health status, his/her personality, his/her social role, the type of activity in which he/she engages, and whether or not he/she has a confidant (Botwinick, 1978).

A View of the Environmental Aspects of Aging

The environment of the aged person is an important component of his/her total behavioral system (Lawton, 1979). A review of the settings and life-styles of older Americans is accumulating. By reviewing various demographic data, one gains more insight into both of the realms that determine the life-styles of older people: (1) the characteristics of the people, and (2) the characteristics of their habitats.

According to the 1975 population statistics, there are more than 22 million people 65 years of age and over in the United States. For every 100 men 65 years and over, there are approximately 144 women. Blacks are markedly under-represented in the aged population, which reflects their shorter lifespan. While Blacks account for 11% of the total population, only a little over 7% of all Blacks and 4% of those of Spanish origin are 65 years of age and over (Brotman, 1977).

In 1974, the median income of households headed by persons 65 years and over was $7,298. For females living alone, it was $2,869 and for males living alone $3,405. An overwhelming 69% of Black women living alone or with a non-relative had incomes below the poverty level (U.S. Bureau, 1976).

The National Health Survey (National Center for Health Statistics (NCHS), 1971) discovered that 85% of the older people in the United States suffered from one or more chronic diseases. An amazing 46% of all noninstitution-alized elderly persons had some degree of limitation in their activities because of these chronic illnesses (NCHS, 1977).

According to census data (U.S. Bureau, 1976), the elderly tend to live in metropolitan areas--34% in cities,

21% in suburban areas, 18% in smaller towns and 27% in rural areas. The majority of older people live in family settings, usually with a spouse (U.S. Bureau, 1976). Older women are far more likely to live alone or with non-relatives--41%--than are elderly men--17%.

According to 1974 statistics (U.S. Bureau, 1974), 68% of those persons 65 years of age and over own their own homes. However, home ownership for the elderly can present many problems. Most of the homes occupied by elderly owners were constructed before the year 1940 (Lawton, 1979). Because the houses are older, they are apt to need more frequent repairs. The proportion of Black elderly without basic plumbing facilities is three times as great as that of Whites. Also, the financial burden of home ownership is great for the elderly. They are still burdened with rising real estate taxes, and costs of maintenance and energy have selectively disadvantaged the elderly who live on fixed incomes (Struyk, 1977).

Every human being is unique, with his/her own personal characteristics. But when placed in a special group, all persons share common characteristics. By use of both demographic data and the results of other research studies, it is possible for one to construct a profile of the "average" older American who lives in a variety of settings (Lawton, 1979).

A majority of the elderly persons are in reasonably good functional health and are relatively mobile within the confines of their neighborhood or community (Lawton, 1979). Although the improvements in Social Security payments over the past few years have helped many elderly persons' financial status, money continues to rank with health as major problems seen by the elderly. Approximately 30% of the elderly Americans spend more than 30% of their incomes for housing (Struyk, 1977).

Contact for most older people with family is frequent and a majority maintain satisfying contact with neighbors, other friends and casual acquaintances. A substantial minority, on the other hand, express some need for more social involvement (Lawton, 1979). While a majority express satisfaction with the important sectors of life, depression, alcoholism, and suicide are high among the elderly (Butler & Lewis, 1973). In very many ways the average older person is similar to people in general; however, he/she must expend a greater proportion of his/her energy to cope with problems associated with income, housing, health care, and social interaction (Lawton, 1979).

Health Services Distribution of Urban and Rural Areas

Health care delivery systems are designed with their main objective being to provide services aimed at alleviating health problems. However, limited accessibility of these health services occurs frequently in the United States. This limitation, particularly for the poor and the elderly, results from financial barriers to needed health care. The reasons for high costs of health care are complex and described further by Perkoff, Kahn, and Haas (1976), Gentry (1978), and Grimaldi (1975). Additional factors relating to accessibility include the unavailability of services in certain rural areas and underserved sections of metropolitan areas as well as the unavailability of certain services on evenings and weekends.

This section of the literature review presents basic elements required of complete health care systems for any community. It also discusses an historical perspective of health services in urban and rural America.

Basic Elements of a Complete Health Care Delivery System

Torrens (1978) has described certain basic elements that should be included in any complete system of health care delivery. The manner in which these services are provided, the way in which they are financed, and the types

of people they serve may be different, but the basic elements should be the same.

The public health and environmental services is one basic element needed in a complete health care system. These services are generally provided to masses of people, usually by local government agencies. Such services include providing clean, safe drinking water and quality air control. Most persons are generally unaware that their community is even providing these services even as they are enjoying their silent benefits (Torrens, 1978).

Public health agencies also provide individual preventative services which are becoming increasingly important. Also, any complete system of health care must contain some means of systematically educating the public about what is possible for them to attain and motivating them toward wanting to attain it (Torrens, 1978).

Emergency medical care also must be provided under a complete health care system. Whatever the resources, the service provided must be immediately available diagnosis and treatment of emergency health problems (Torrens, 1978).

Simple and complex ambulatory care services as well as simple and complex inpatient hospital care must be available for a comprehensive health care system to exist. Long-term, continuing care along with rehabilitation

41

services also must be provided. Available care for social, emotional and developmental problems is an important element when considering total health care for individuals (Torrens, 1978).

It has been suggested frequently that a complete system of health care should include the availability of transportation. Whether it be for incapacitated persons who cannot move without full assistance, for emergency care, or for socially disadvantaged persons who cannot take advantage of the rest of their community's resources without transportation assistance, it does seem that a comprehensive system of health care should include some form of transportation service (Torrens, 1978).

Any health care system should be organized in a way to provide persons who are recovering from an illness with financial assistance to help them renew their former life pattern. Therefore, Torrens (1978) includes financial compensation for disability as an important element to be included in a comprehensive health care delivery system.

The services mentioned above are definitely not the only types of services that could be mentioned as part of a total system for health care. But they do form a basic core around which many other kinds of services may be provided. Even with the wealth of health care facilities today in the

United States, the health needs of the elderly are not being met adequately by the traditional health care delivery system (Libow, 1977). Current policy regarding the provision of health care services to the elderly reflects the concept that health care is a right. Most recent efforts to improve the elderly person's access to health care have focused on reducing the financial barriers to obtaining care (Paringer, Bluck, Feder, & Holahan, 1979). There is no question that public programs have increased the utilization of health care services by the elderly, however, differences do occur in the provision of these health services between urban and rural areas.

Historical Perspective of Health Services for the Elderly in Urban and Rural America

The notion that rural life has its health handicaps, in spite of fresh air and sunshine, was first expressed in 1862 in the First Report of the Commission of Agriculture to President Abraham Lincoln (Roemer, 1976a). Dr. W. W. Hall (cited by Roemer, 1976a) reported high incidence of insanity among farm people, of respiratory disease, of gastro-intestinal problems associated with the use of outdoor bathrooms and of the longevity of farmers which is not so great as one might suppose. Mortality in rural populations, age-adjusted, was lower than in urban populations in

1900 and this fact remains valid today (Paringer et al., 1979). However, the need for health services has never been defined by death rates alone. Social actions have been stimulated more by the problems of disease, pain, suffering, and disability regardless of mortality tables.

After the Civil War, America developed rapidly with the rise of industry, expansion of the West, and the growth of large cities. Thousands of immigrants from Europe came to America to provide a work force for factories. They eventually became congested in urban slums. In this kind of atmosphere, the prominent issue in health service was to prevent communicable disease from spreading within the cities. Therefore, the public health movement, which took shape in these years, was fundamentally urban (Roemer, 1976b).

It was not until 1910 that the first health departments for promotion of preventive health service were organized on a county instead of city basis. The first local health department staffed with a full-time health officer, established in a county that contained no incorporated place of 2,500 or more, was in Robeson County, South Carolina in 1912 (Roemer, 1976b).

By the end of World War I, the United States had acquired a powerful economic and political position in

the world. At this time several movements for improved health care service began to take shape with clear implications for rural areas. The goal of American Public Health leadership after 1920 became the achievement of "coverage" of all of the nation's 3,070 counties with full-time health departments. The enactment of the Sheppard-Towner Act in 1921 helped to strengthen the rural county health departments by providing federal grants to the states for supporting maternal and child care sections (Roemer, 1976b).

The massive economic depression that began in 1929 was a setback for both urban and rural public preventive health efforts. Government attention became focused on the rapid relief of the destitute. Emphasis also was being placed on provision of federal allocation of funds toward old age and disability insurance programs along with job incentive programs. However, it took the Social Security Act of 1935 to give the needed boost to public preventive services (Roemer, 1976b).

The scope of public health services in the United States generally has widened to include mental health, chronic disease detection, accident prevention and many other services. But this broader policy seldom applies to the small health units in rural districts (Roemer, 1976b).

As suggested above, health care needs of persons of
all ages are considered to be greater in rural areas than
in cities. For a variety of reasons studied by numerous
commissions and committees, rural people do not have the
same opportunities for health care as do urban people.
Rural and urban areas differ widely in their general char-
acteristics, but generally speaking, in rural areas the
physician shortage is more acute, persons travel longer
distances to obtain health care, emergency health services
are more deficient and a comprehensive approach to health
care often is not present (Matthews, 1974).

It is important, as noted by Paringer et al. (1979), to
emphasize that whatever elements are attributed as compro-
mising the health care delivery in the United States today,
these typically are severely aggravated in rural areas.
Several factors which characterize the rural population and
differentiate it from the urban population contribute to
rural health care problems.

Income. As shown in Table 1, rural family incomes are
generally lower and a greater proportion of rural people
live below the poverty level. In 1970, one out of every
six persons in rural areas lived in poverty as compared
with one out of every ten in urban areas (Paringer et al.,
1979).

Table 1

Persons Below the Poverty Level, by Residence, 1970

Residence	Total U.S. Population	Percentage of Total Population in Poverty
U.S. Total	202,489,000	12.6
Metropolitan Areas	130,907,000	10.2
Inside Central City	57,290,000	14.3
Outside Central City	73,617,000	7.1
Non Metropolitan	71,580,000	17.0

Source: Paringer et al., 1979.

Poverty makes access to health care more difficult. Persons experiencing poverty often cannot pay for medical care nor for the means of transportation to reach that needed care. Statistics from the U.S. Bureau of the Census of 1969 show that the financial status of the Black elderly are consistently worse than that of Whites (Table 2).

Mobility and place of residence. Elderly Americans, on the average, are much less mobile than the rest of the population. The aged change residence at only one-half the rate of the total population. In 1970, approximately two-thirds of the elderly in America lived in metropolitan areas and about one-half of these lived in central cities.

Table 2

Percentage of Persons Aged 65 and Over Living Below
the Poverty Level, by Race and Residence,
1969

Race	Urban	Rural Nonfarm	Rural Farm
White	21.0	34.4	23.7
Black	42.7	65.2	55.8

Source: U.S. Bureau of the Census, 1974.

Of the total population over 65 years, 27% lived in rural
nonfarm and farm locations. Within the over-65 age group,
the percentage living in rural or urban areas does not vary
greatly with age. Elderly Blacks are more likely than
elderly Whites to reside in urban areas (Paringer et al.,
1979).

Place of residence provides an indication of access to
health care services. The lower physician-to-population
ratios, as shown in Table 3, in rural areas combined with
longer travel time to health care facilities suggest that
the rural elderly may be at a disadvantage to obtaining
adequate health care.

The discussion above offers only a brief description
of the aspects of the rural-urban differences in health
care delivery to the elderly. Available evidence indicates

Table 3

Distribution of Physicians per 100,000 population, by
SMSA[a] and Non SMSA areas, 1970

Non Federal Physicians	Total		Per 100,000 Population	
	SMSA	Non SMSA	SMSA	Non SMSA
General Practice	34,359	16,457	23.0	30.4
Special Practice	121,731	16,377	81.5	30.3
Hospital-Based	61,596	4,507	41.2	8.3

Source: Quint, 1976.

[a]SMSA--a standard metropolitan statistical area defined at the time of the 1970 census, which generally consisted of one county or a group of counties which contained at least one city of 50,000 or more, or twin cities with combined populations of at least 50,000. SMSAs are basically urban and the non SMSAs are largely rural.

that Federal health care spending disproportionally favors metropolitan areas. In a recent study, for example, it was shown that per capita 1970 Federal outlays for health care were four times greater in metropolitan areas (U.S. Senate, 1971).

Thus, one can conclude that urban and rural persons do not have equal access to health care services. Rural areas are deficient in professional health care personnel, physical health care facilities, therefore curtailing the ability to afford health care services, especially for the poor and the elderly.

Medication Compliance

Behind the common stereotype of the elderly, based on the overly studied 5% of those persons 65 years and over who reside in nursing homes and whose medication regimens are supervised daily, looms the other 95% who live in varying degrees of self-sufficiency in the community and who generally are responsible for self-medication (Plant, 1977). Many of these noninstitutionalized persons, approximately 86% (Lenhart, 1976), have one or more chronic conditions that require treatment by medication therapy. The independent and self-sufficient elderly who are responsible for their own medications need to develop a respect for their drug therapy.

The gap between the medication therapy prescribed and that which is actually taken is distressingly wide for self-administered regimens (Sackett, 1976). Studies of elderly patients have shown that half do not take the drugs prescribed and that from 25% to 59% of these persons make errors in self-medication (MacDonald, MacDonald, & Phoenix, 1977). Many persons do not clearly understand their prescribed medication regimens (Parkin, Henney, Quirk, & Crooks, 1976), and in more than one-third of these older people the resulting errors actively endanger their health (Stewart & Cluff, 1972).

This health problem can be expected to become more acute. Owing to the growing number of elderly persons in the population, the related increase in the incidence of chronic illness and the availability of facilities and funds for health care, there are more persons than ever before who seek and receive health services, including highly potent medications (Hecht, 1974).

There is a great deal of interest in the problems of the elderly taking drugs correctly and appropriately. Many recent studies have shown the problems of drug inter-action and adverse reactions between different drugs pre-scribed for the elderly (Atkinson, Gibson & Andrews, 1977). It is significant to note that a great number of drugs may be prescribed for an old person, each to be taken in a dif-ferent number, usually at different times. Whitehead (as cited in Atkinson et al., 1977) termed this phenomena "polypharmacy." There can be a complex pattern of pill-taking that even a young alert adult might find difficult to maintain accurately. In a recent survey (Dass, Maddock, & Whittingham, 1977), 25% of the elderly persons were found to be incapable of taking more than three medications reliably at any one period. In March 1976, a general prac-tice survey (Law & Chalmers, 1976) was conducted and it was found that 25% of the elderly subjects were on more than three drugs regularly.

A survey conducted at Augustina Hospital and Health Care Center in Chicago (Plant, 1977) found a variety of self-medication habits of the elderly as determined by studies and observations. Some of these include:

1. Lack of knowledge of the name of the drug and reason for its use.

2. Lack of knowledge of how a particular drug must be taken to be effective.

3. Lack of knowledge of what a side-effect is.

4. Stretching medication to last longer or taking more than what is prescribed in the belief that two pills are better than one.

5. Borrowing and lending medications.

6. Saving old medications and tending to self-treat with them.

7. Taking medicines irregularly because of forgetfulness, illness and/or other conditions (Plant, 1977).

Determinants of Noncompliance

It is discouraging to review the magnitude of noncompliance which exists among the population. Many studies have shown that 50% of the subjects for whom medication therapy is prescribed fail to receive the full benefit through inadequate adherence to treatment (Haynes, 1976).

Haynes (1976) has reviewed the existing knowledge and literature concerning compliance and issues relating to it. Following is a discussion of the existing knowledge about the determinants of noncompliance.

Many studies have examined such demographic characteristics as age, sex, education, religion, and socioeconomic status. However, very few of these studies have found any association between these factors and compliance or noncompliance (Haynes, 1976).

Few associations have been found to exist between certain disease features and compliance. Therefore, with the exception of patients with psychiatric labels, one is not able to identify a noncomplier by his/her diagnosis (Haynes, 1976).

In reference to the features of the therapeutic regimen, evidence suggests that regimens that require more extensive behavioral changes reduce compliance. Also increasingly complex regimens and long-term therapy tend to reduce compliance (Gillum & Barsky, 1974; Haynes, 1976).

With some difficulty, several research studies have examined the interactions between patients and those who care for them. Two findings have emerged from these studies. First, there has been found a positive relationship between the degree of supervision and medication compliance.

Second, the patient's stated level of satisfaction with the therapist and clinic was also found to be associated with compliance (Haynes, 1976).

Several studies have attempted to describe the relationship of certain sociobehavioral features and compliance. One interesting attempt to explain health-directed behavior of individuals is described as the "Health Belief" model. This model, as described in Chapter 1, relates a person's perceptions of the seriousness of his/her illness and the efficacy of the treatments they receive to actual compliance with therapeutic regimens (Becker, 1974). Although there is some inconsistency in the findings, several studies have indicated that belief in the personal threat or severity of an illness increases the probability that a person will undertake action to prevent the illness (O'Connell & Marvin, 1979).

A person's perception of the ability of the medication to relieve symptoms is an important correlate of compliance. One investigation revealed a statistically significant relationship between individuals' estimations of the effects of their own regimens on discomfort and their compliance with the regimens. Greater amounts of discomfort after medication therapy were related to greater degrees of noncompliance (O'Connell & Marvin, 1979).

A Review of the Findings Related to
Medication Noncompliance

From a total study sample of 47 persons on tuberculosis medication, Hecht (1974) found that 68% of the subjects made medication errors. The errors were recorded as a pill count greater than one pill or by a negative Belles-Littleman test for isoniazid. Of the total study sample, 45% made serious errors, shown by pill count deviations of more than 15%, or negative urine indicating the medication had not been taken. In this study, age and education of the subjects did not correlate with medication compliance. There was no evidence of correlation between medication performance and any demographic characteristic.

Neely and Patrick (1968) interviewed 59 subjects whose ages ranged from 60-84 years. Of the total study sample, 41% were making no medication errors. For the 59% who made errors, the mean number of errors per subject was 2.3. No significant differences were found between error-free and error-making subjects in relation to age, sex, marital status, household composition, education, birthplace, employment status, or duration of present illness. A significant finding from this study was the relationship between the number of medications and number of errors. Respondents who took three or more medicines made

significantly more errors ($\chi^2 = 6.68$; d.f. = 1; $\underline{p} = .01$) than those who took only one or two medications.

MacDonald et al. (1977) studied an unselected group of 165 consecutive discharges from the department of geriatric medicine of an urban hospital. The subjects were allocated by rotation to one of three groups: (1) counselled group-- about 15 minutes was spent with each subject going over their prescribed medicines and reviewing wise drug use practices; (2) counselled group with memory aids--subjects were counselled as described above and given one of three types of memory aids; and (3) uncounselled group. The remaining subjects were given their medication in the routine manner of discharge. All subjects were rated on the Mental Status Questionnaire (MSQ). The findings showed significant differences between the counselled and uncounselled groups in the number of persons making medication errors after one week of discharge (MSQ≥12; $\chi^2 = 8.29$, $\underline{p} < 0.01$; MSQ≥12, $\chi^2 = 3.92$, $\underline{p} < 0.05$). At 12 weeks after discharge, there remained a significant difference between the counselled and uncounselled groups (MSQ≥12, $\chi^2 = 8.30$, $\underline{p} < 0.01$; MSQ≥12, $\chi^2 = 4.03$, $\underline{p} < 0.05$).

Wandless and Davie (1977) studied 46 patients in rehabilitation units at a university department of geriatric medicine. Subjects were aged 64-93 years. All of the

subjects were given standard verbal instructions about their medications. Those in Group 1 received only this verbal instruction. Persons in Group 2 also received a calendar detailing each day's treatment. Each person in Group 3 was given a card identifying each tablet and detailing the regimen. Applying a chi-square, it was found that Group 2 made significantly fewer pill count errors than Group 1 ($p<0.0005$). In considering the groups as a whole, those persons who were given an aid to memory made significantly fewer mistakes in their pill-taking. These findings indicated that drug compliance in the elderly can be improved by giving persons written as well as verbal instructions.

Malahy (1966) conducted a study to show that when persons are taught about their medications and have drugs that are labelled with the name, they will make fewer medication errors. Subjects were in one of four groups (10 per group). Group I received their drugs as usual and served as a control group. Group II received prescription drugs that were labelled with the name of the drug. Group III received planned instruction about each of their drugs. Group IV received planned instruction and labelled medications. Analysis of the collected data showed no significant differences between groups in relation to medication

error-making. Also, no significance was found to exist between age, education, and total number of medications and the total number of medication-errors.

An interesting study was conducted by McKenney and Harrison (1976) examining the association between hospital admissions and drug related problems in 216 subjects. All persons admitted to a general 100-bed ward in a large hospital over a two-month period were interviewed by a pharmacist to discover: (1) prescription and non-prescription drugs regularly self-administered, (2) method of administration, (3) patients' compliance with prescribed medication therapy, and (4) signs and symptoms of adverse drug reaction. Of the 216 study subjects, 27% were found to have a drug-related problem with his/her hospital admission. Adverse drug reactions and noncompliance appeared to be principle factors in hospital admission. No tests of statistical significance were performed or reported.

Gabriel, Gagnon, and Bryan (1977) reported drug compliance rates of 49 persons with a diagnosis of hypertension of at least one year's duration, who were 50 years of age or older, and who were taking two or more chronic prescription medications. Those in Group A were given a daily reminder chart and those in Group B were not. The intergroup difference in mean compliance scores (using pill

counts) between Group A and Group B was found to be statistically significant (p = .002).

Another study performed by Spector, Cohen, McGrath, Newman and Uretsky (1978) attempted to determine whether a clinical nurse could improve the level of medication compliance in an outpatient clinic setting. The direct method of measuring the drug level in the blood was used as the indicator of drug compliance. From the analysis of the collected data, the authors did not show a statistically significant correlation between instruction by a nurse and medication compliance. These results also failed to support the previously reported observation that drug compliance decreases as one increases the total number of drugs (Marston, 1970), or that compliance is especially poor for the elderly population (Marston, 1970).

Davis (1968) carried out a study to test the hypothesis that certain subject characteristics could explain variations in behavioral and attitudinal compliance. Compliance as an attitude was described as a person's willingness to do or not to do what the physician prescribes. Compliance as a behavior was defined as existing only when the subject actually carried out the physician's orders. The study sample consisted of 154 new patients; 77 were seen by junior physicians, 77 were seen by senior physicians.

For a period of eight months, tape recordings of the physician-patient visits were made. Subjects also were interviewed and the physicians received questionnaires at varying stages of the patient's illness. Although 77% of the sample expressed a willingness to follow the physician's advice, only 63% actually displayed compliant behavior.

Within Davis' (1968) study, no variation in patients' compliant behavior could be attributed to characteristics of the subjects' demographic statuses. In reference to physiological factors and compliance, the data showed that patients with less severe medical problems were more likely to comply with medical advice. A statistically significant relationship was found to exist between compliance and extent of patient disability. An interesting part of the study concerned the relationship between personality factors and medication compliance. Two sets of personality factors --(1) responsiveness, cooperativeness and gratefulness, and (2) articulateness, intelligence and formal education--were related positively to behavioral compliance.

Brand, Smith, and Brand (1977) found that the most often-cited reason for noncompliance was economic. Over 34% of Brand et al.'s total study sample stated that they were either unable to afford to buy prescribed drugs or could not afford to take them for as often as the prescription

called. This suggested that the noninstitutionalized elderly, and particularly the poor, may be more troubled by the underuse of drugs rather than overuse.

Review of the literature indicated that even with the advent of Medicare and Medicaid, less than half of the health care costs of the elderly are covered by these services, and only one-third of costs are covered by private health insurance benefits. Additionally, large numbers of medically indigent individuals do not have private health insurance and are not eligible for Welfare Department Medical Assistance Programs. Some other factors include inability on the part of many individuals to cope with the complexities of the system, and the absence of support services to help with such things as transportation requirements or child care needs (Gentry, 1978; Hammerman, 1974; Restuccia & Holloway, 1976).

Vincent (1971) conducted a study of 62 glaucoma patients and analyzed factors which might influence their noncompliant behavior in the use of prescribed eye-drops. The subjects were interviewed to obtain self-reporting of medication compliance. Physical factors of the clinic and patient social and cultural characteristics were analyzed for their association with medication compliance.

Of Vincent's (1971) total sample of 62 subjects, over
50% reported noncompliant behavior. An interesting finding
from this study was that a significant difference did exist
between compliers and noncompliers according to whether or
not they were taking medicines other than their eye drops
on a daily basis. More than 50% of the respondents who were
taking other medications daily were compliers, whereas
almost 75% of those who were not taking other daily medica-
tions were noncompliers.

Nursing and Compliance

Nurses have long been aware of the discrepancies
between what is prescribed for an individual and what he/she
actually experiences. Nurses also have long been involved
in promoting and studying compliance. Through this effec-
tive research strategy, nurses have gained and continue to
gain important knowledge about the issue of compliance. In
this process they continually are contributing recommenda-
tions for present nursing practice and future research.

Nurses have figured prominently in successful
strategies to promote compliance (Hogue, 1979). Through
the years their contributions have been especially impor-
tant in this aspect of the management of chronic disease.
In Wilber and Barrow's (cited by Hogue, 1979) study pub-
lished in the Minnesota Medicine in 1969, the improved

effect of reinforcement from Public Health Nurses on compliance with antihypertensive regimens among 220 out-patients in rural Georgia was reported. Compliance rates for the experimental group (who received periodic home visits by the PHN) improved from 15% to 80%! Those rates in the control group improved from 15% to 34%. Two years after the visits stopped, the experimental group's rates decreased from 80% to 29% (and from 34% to 21% in the control group). Nursing intervention was effective in Wilber and Barrow's study, supporting the concept that extended supervision is at least one active ingredient for compliance (Haynes, 1979).

Nurses have always had the responsibility for insuring as far as poosible that hospitalized inpatients received their prescribed treatments. Now with the advent of effec-tive treatment for chronic illness and the extension of the nursing role into ambulatory care settings, it seems only natural that nurses should take on the management of com-pliance as part of their responsibility in the delivery of health care (Hogue, 1979).

Improving poor compliance is a challenge to health care providers with substantial awards for the provider and the recipient of care. Nurses, through practice and research, can and are providing one of the most important

means to the humane and sensible solution to this health
care problem.

Summary

The realization that nonadherence to medication
regimens impedes adequate treatment has encouraged a
growing number of research studies in this area. From the
preceding review of the literature, one can infer that
researchers have not come to a unanimous conclusion about
the distinctive characteristics of a noncomplier. However,
such findings always yield valid, useful information for
practice and for future research.

CHAPTER 3

PROCEDURE FOR COLLECTION AND TREATMENT OF DATA

Among health care professionals, there is a need to know if a relationship exists between knowledge about taking medications wisely and actual medication compliance behavior of those elderly persons who self-administer prescribed medications. Other questions of consideration are: "How will a specific education program affect medication compliance of the elderly?" and "Do selected demographic factors correlate with medication compliance?"

An attempt to answer these questions was made in this part of a research cluster study. This chapter outlines the procedure used for collecting data. The setting of this part of the cluster study is described. The population and sample along with the sampling technique used are presented. The means used for the protection of the study subjects are included. The procedure for construction of the instruments is described and the reliability and validity of these instruments is given.

A detailed account of how the data were collected is presented along with a description of how the collected data were analysed. A brief description of the pilot study performed is included.

An evaluative, experimental approach, known as the four group, before-after with two control groups design, was used for this study (Campbell & Stanley, 1966). This applied evaluative research study was conducted as a separate part of a cluster study to determine the effect a structured educational program for elderly persons concerning wise medication use would have on the elderly participants' actual medication compliance. There were three separate studies within this cluster study design. Separate geographical sites were used for each study. Because of the nature of a cluster study, the instruments used, the oral consent form, and the content of the research design were the same for each study conducted.

The Elder-Ed program, sponsored by the National Institute on Drug Abuse (NIDA)(1979) and funded by the United States Department of Health, Education, and Welfare (DHEW) was the educational program used in this study. Houston-Galveston Area Council (H-GAC), after deciding to institute the program for the senior citizens attending the nutrition sites within their region, purchased the educational material from DHEW.

Setting

The setting for this study was the federally-funded nutrition sites for the elderly which are under the auspices

of H-GAC, of which the Area Agency on Aging (AAA) is a division. There are 21 nutrition sites administered by AAA in an area that encompasses 13 counties, outside of Harris County, which are in the Gulf Coast Planning Region. See Appendix B for a complete list of these nutrition sites.

This research took place in the main eating room of each site visited. The nutrition sites are established in conveniently located areas, such as churches, community centers, senior centers, and other public or private facilities. Here, the elderly are served hot, well-balanced lunches at least five days a week. Menus are planned to provide a minimum of one-third of daily recommended dietary allowances established by the Food and Nutrition Board of the National Academy of Science-National Research Council (Governor's Committee, 1976-1978).

Population and Sample

Of the 21 nutrition sites administered by the AAA, 16 are designated as urban sites and 5 as rural sites. The three smallest urban nutrition sites were used for a separate pilot investigation conducted by another researcher. Two additional urban sites are attended by predominantly Spanish-speaking persons and were not used in this study.

The population of this study included all persons attending the 11 urban nutrition sites and the 5 rural

nutrition sites. Attendance at each of the 13 urban sites
ranges from 30 to 80 persons, whereas attendance at each
of the rural sites ranges from 30 to 65 persons.

Sampling Technique

A stratified random sampling technique was used in
this investigation. The following model illustrates the
technique applied:

First Strata   Rural sites

Urban sites

Second Strata   By use of the lottery method, two
of the five rural nutrition sites were
randomly selected to be included in
this study. Then, by use of the
lottery method, these two sites were
randomly assigned as one experiemntal
and one control group.

Third Strata   By use of the lottery method, 2 of
the 11 urban sites were randomly
selected to be included in this study.
Then, by use of the lottery method,
these two sites were randomly
assigned as one experimental and one
control group.

The instruments and the treatment were administered to all those attending the sites under study. Eligibility criteria were set and those not conforming to these criteria were excluded upon initiation of data analysis.

Eligibility criteria were:

1. Attendance at nutrition site

2. 60 years of age or over

3. Responsible for self-medication at time of data collection onset

4. Presently taking at least one prescription medication

5. Voluntary participation

6. Able to speak English

Protection of Human Subjects

The Human Research Review Committee at Texas Woman's University and the appropriate personnel at H-GAC provided written approval prior to initiation of the study (Appendix C). A code system was used to identify the demographic data sheet and the questionnaires during the data collection process. No names were placed on the questionnaires. To minimize attrition of subjects, due to forgetting one's code number, a list of participants' names was matched with the codes during the data collection period. These names as well as the code system were destroyed at the end of data

collection. Only voluntary participants were included in the study to protect individual rights.

Instruments

The instruments used were developed by the investigator. The Demographic Data Profile (Appendix D) was the instrument used to collect such data as age, sex, ethnic origin, marital status, income, living arrangements, present illnesses, present medication regimen, ability to self-medicate, and use of one or more drug stores for medication fills and refills.

The second instrument, Self-Reporting Profile (Appendix E), was concerned with self-reporting of medication compliance. The Self-Reporting Instrument was changed from a 5-point Likert Scale format to a 3-point format. As was found in the pilot study, the original 5-point scale proved to be too confusing for the participants with many of them checking several categories. Therefore, upon discussion with the committee, an agreement was made to change the instrument to a 3-point format.

The questions on the Self-Reporting Profile were coded such that a high score on this instrument indicated a relatively higher degree of medication compliance than a low score. An item analysis was performed on this instrument and the discriminative power of each item was

calculated. Those items with a discriminative power of less than one were discarded.

Content validity of the Self-Reporting Profile was established, as presented, through a panel of experts. The panel consisted of a clinical pharmacist, an H-GAC employee who is familiar with the Elder-Ed program and its content, and a Texas Woman's University baccalaureate faculty member who serves on the advisory committee of H-GAC. These three judges were given the packet of printed material and an opportunity to view the film. Agreement on content validity of two of the three judges was the criterion for acceptance of this instrument.

Reliability of the Self-Reporting Profile was established through the use of a method to determine internal consistency. The method known as coefficient alpha was used since it gives an estimate of the split-half correlation for all possible ways of dividing the questionnaire into halves and it is appropriate for ordinal scales. The coefficient alpha for this instrument was .75.

The third instrument, Knowledge Profile (see Appendix F), uses dichotomous items to measure knowledge of certain aspects of wise drug use. The subject matter of the knowledge Profile is based on the content of the film and the information packet of the Elder-Ed educational program.

Each correct response to a knowledge question received one point, while each incorrect answer received no points. The possibility of range of scores was 0-10. These scores were calculated into percentages by dividing the number of correct answers by the total points possible.

The content validity of the Knowledge Profile was obtained in the same manner as described above for the Self-Reporting Profile. The reliability of the Knowledge Profile was obtained through the use of another method of internal consistency, appropriate for interval and ratio scales, known as the Kuder-Richardson 20. The reliability of this instrument was .58.

A Pill Count Record (see Appendix G) was kept for each participant in the study. This instrument measures medication compliance on a ratio scale.

Some of the items contained in the Self-Reporting Profile and the Knowledge Profile were adapted from a previous survey conducted by the Heart of Texas Council of Governments (HOTCOG) entitled "Medicine Use Study Among Persons 60 and Over at Senior Centers in the HOTCOG Region." Verbal permission for use of sections of this survey was first obtained; written permission was obtained from the proper personnel (see Appendix H).

Data Collection

The initial contact the investigator had with the study group was through a prearranged meeting with the managers of the nutrition sites which were selected for the study. At this meeting, the managers learned of the specific plans for conducting the study. Emphasis was placed on the importance of the site manager's cooperation and assistance in helping to remind the participants to bring their prescription medicines to the nutrition sites.

On a designated day, one week prior to initiation of the study, the investigator visited each sample site. Posters announcing the date of the first step of data collection were placed at different areas in the nutrition site, specifically in the room where the senior citizens spend most of their time. When a calendar of events was used in a nutrition site, the date of the investigator's return was marked here also.

During this visit, using a list of the attendants of the specific site, the researcher personalized individual brown bags identified with each subject's name. The managers were asked to distribute these brown bags one day before the initiation of the study. The prospective participants were asked by the managers and the researcher to bring all of their oral pill-form prescription medicines

in these bags to the nutrition site on a day designated for initiation of the study. On this same day, the researcher met with the van drivers who were volunteers responsible for transporting most of the elderly to and from the nutrition sites. Their role in aiding the participants to remember to bring in their prescription medicines was explained and their cooperation was elicited.

Two days prior to the initiation of the study, the investigator phoned the site to remind the managers to distribute the individual medication bags to the senior citizens. On the morning of the initiation of the study, the van drivers were contacted to remind them of their vital role.

On Day 1 of data collection, a consent (see Appendix I) to participate in the study was read aloud to the senior citizens and signatures were obtained. It was explained that all persons attending the nutrition site could receive the benefit of viewing the program whether or not they wished to paritipate in the study. It also was explained that each of the participants was free to withdraw from the study at any time.

The data collection took place at a time most convenient to the senior citizens and the nutrition site managers. For two groups, data collection took place

before the noon meal and for the other two, after the noon meal. Small groups were formed and limited to five to six persons to allow for more contact with each of the participants. The demographic data was collected first by reading the Demographic Data Profile aloud then asking the participants to respond as appropriate. Afterwards, the first pill count was manually conducted using the Pill Count Record.

The Demographic Data Profile, the Self-Reporting Profile, and the Knowledge Profile and the Pill Count Records were coded for identification. Each participant was given a code number that was pasted to his/her wallet. A master list was kept by the researcher with the names of the participants and their code numbers.

Five days after the initiation of the study, the managers were contacted and reminded to give the participants another personalized medication bag. On the morning of the second round of data collection, the van drivers were called for their assistance in reminding the participants to bring their medicines to the nutrition site.

On Day 2 of data collection, the pretest, which consists of the Self-Reporting and the Knowledge Profiles, was given to the participants. Instructions were read aloud and the senior citizens responded as appropriate. A second pill count was then conducted.

On this same day, after the pretesting was completed, the presentation of the film and distribution of the informational packets took place only in the experimental groups. After the film, an informal question and answer session was held for 10 to 15 minutes.

Five days after the second period of data collection, the managers were contacted to remind them of their role in the study. On the morning of Day 3 of data collection, the van drivers were notified of their role in the study. On Day 3, prior to the noon meal, the posttest, which consists of the Self-Reporting and Knowledge Profiles, was administered, then the third pill count was conducted. The procedure for data collection for the control groups was generally the same, however, there were only two days of data collection. The first day of data collection included the Demographic Data Profile, the Self-Reporting Profile, the Knowledge Profile, and a baseline pill count. One week later, on the second day of data collection, the Self-Reporting Profile and the Knowledge Profile were readministered and a second pill count was conducted. The treatment was withheld until one week later. Upon completion of the posttest period, the investigator thanked the participants, the site managers, and the van drivers for their participation and cooperation in the study.

Pilot Study

A pilot study, separate from this investigation, was conducted in the three least populated urban nutrition sites. No rural sites were used in the pilot study. Reliability of the instruments for this study was obtained from the pilot study data.

Treatment of Data

All collected data were tabulated by the investigator. Descriptive statistics were used in reporting the demographic data from each group. Means and standard deviations were calculated for the data collected which are at the interval or ratio levels of measurement. These include age, present level of educational attainment, number of illnesses, and number of prescribed medicines. Modes and percentages were used to describe those data collected at the nominal level of measurement. The self-reporting measure of compliance was described by use of the median and range. The pill count measure of compliance was described by use of the mean and standard deviation. The mean and standard deviation were used also to describe the scores obtained from the knowledge instrument.

Inferential statistics were used to test the significance of group differences--between the urban and rural nutrition sites, between the experimental and control

groups and between each group--at p≤.05. The Kruskal-Wallis one-way analysis of variance or the Mann-Whitney U was used to determine if a significant difference exists between the independent variables--race, sex, marital status, religion, employment status, socioeconomic status, household composition, type of illness--and the dependent variable self-reporting aspect of medication compliance.

The above-cited independent variables were analyzed for significant group differences--between urban experimental and urban control, between rural experimental and rural control--at p≤.05 with the pill counting measure of compliance and again with the knowledge scores by use of a one-way ANOVA. If the independent variable was dichotomous in nature, t-tests were used.

The one-way ANOVA was used also to test the difference in the mean gain scores of the Knowledge Profile for the pretest and the posttest between the urban experimental and urban control, between rural experimental and rural control, and among all the study sites. When a significant F ratio was found, the Tukey Post Hoc Test was used to determine the specific area of significant differences.

For statistical purposes, the dependent variables of medication compliance (self-reporting) and knowledge were analyzed for association within each group using the

nonparametric test, Spearman Rank Correlation Coefficient, Spearman's Rho. Association between the pill count measure of compliance and knowledge was analyzed by use of the Pearson product-moment correlation coefficient, Pearson r. These calculated correlations were converted to a t in order to test the above correlations for statistical significance at $p \leq .05$. All results are reported in Chapter 4.

CHAPTER 4

ANALYSIS AND TREATMENT OF DATA

An evaluative, experimental approach known as a four-group, before-after with two control groups design was used in conducting this study. The purpose of the study was to test the following hypotheses:

1. A structured educational program will improve the participants' knowledge about wise medication use.

2. Knowledge about aspects of correct medication-taking behavior is positively associated with medication compliance.

3. Selected demographic variables are associated with medication compliance.

This chapter presents the findings of the study. Demographic characteristics of the sample are presented first for the entire sample and then categorized according to site location. Finally, statistical results in the comparisons of the sites are described and correlations are presented in relation to the above stated hypotheses. For clarification and ease of description, reference to the sites within this chapter will be designated as:

Site A   Urban Experimental

Site B   Urban Control

Site C   Rural Experimental

Site D   Rural Control

Description of the Sample

The final sample was composed of 25 elderly persons, 60 years of age and over, who attended the federally-funded Nutrition Sites that are under the auspices of Houston-Galveston Area Council (H-GAC). Of this total, 11 (44%) subjects represented the Rural Nutrition Sites with 4 (36%) being in the experimental group and 7 (64%) in the control group. Fourteen (56%) subjects represented the Urban Nutrition Sites with 6 (24%) in the experimental group and 8 (32%) in the control group (see Table 4).

Table 4

Distribution of Participants by Site Location with
Percentage of Total Population

Site Location	Number	Percentage of Total Population
A	6	24
B	8	32
C	4	16
D	7	28
Total	25	100

Sociodemographic data revealed that 9 (36%) participants were males and 16 (64%) were females. Racial characteristics of the subjects included 17 (68%) Black participants and 8 (32%) White participants. Table 5 summarizes race and sex by site location.

Table 5

Distribution of Participants by Race and Sex
by Site Location

Site Location	Black Males	Black Females	White Males	White Females
A	2	4	0	0
B	4	2	0	2
C	0	0	2	2
D	0	5	1	1
Total	6	11	3	5

Age Distribution

The ages of the participants ranged from 60 years to 100 years. The mean age of the total sample was 74.6 years; median 74 years and mode 71 years. Table 6 shows the mean age by sex and by site location.

The mean age of the male participants was consistently higher than the females. The 100-year old participant was a Black male who enthusiastically participated in the study.

Table 6

Mean Age by Sex and by Site Location

Site Location	Females Mean Age	Males Mean Age
A	75.5	89.5
B	72.5	81.5
C	68.5	75.0
D	68.0	75.0

Marital Status

The findings related to marital status indicated that seven (28%) subjects were married. Seventeen (68%) participants were widowed and one (4%) was divorced. Table 7 illustrates the marital status of the sample by site location.

Table 7

Marital Status of Participants by Site Location

Site Location	Marital Status		
	Married	Widowed	Divorced
A	2	4	0
B	1	7	0
C	2	2	0
D	2	4	1
Total	7	17	1

Religion

Of the total sample, 2 (8%) subjects were Catholic, 18 (72%) were Protestant, and 5 (20%) were categorized as "other." Table 8 describes the total sample according to religious affiliation, by site location.

Table 8

Religious Affiliation of Participants by Site Location

| Site Location | Religious Affiliation | | |
	Catholic	Protestant	Other
A	1	5	0
B	0	6	2
C	0	4	0
D	1	3	3
Total	2	18	5

Educational Background

The collected data on educational background revealed that 11 (44%) subjects had from 0-6 years of school and another 11 (44%) had from 7-12 years of school. Only two (8%) participants reported to be high school graduates and one (4%) was a business/technical school graduate. Table 9 offers the educational background of each site.

Table 9

Educational Background of Participants by Site Location

Site Location	Educational Background			
	0-6 Years	7-12 Years	High School Graduate	Business/ Technical School Graduate
A	3	3	0	0
B	4	4	0	0
C	1	2	0	1
D	3	2	2	0
· Total	11	11	2	1

Employment and Socioeconomic Status

Of the total sample (n=25), only two (8%) subjects reported to be working full time, 3 (12%) were working part time, and 20 participants (80%) were retired or not working. Only one (4%) subject reported a monthly income of between $400-$999. Twenty-four participants (96%) reported monthly incomes of between $100-$399. These findings are consistent with national statistics that find the elderly in low income brackets (U.S. Bureau, 1976).

Living Arrangement

Fifteen (60%) participants in the sample indicated that they were living alone. Five (20%) reported living

with his/her spouse. Four subjects (16%) revealed that
they lived with one of his/her children and one individual
(4%) reported to be living with another relative. These
findings are summarized, site specific, in Table 10.

Table 10

Living Arrangement of Participants by Site Location

Site Location	Living Arrangement			
	Alone	With Spouse	With Child	With Other Relative
A	4	1	0	1
B	5	1	2	0
C	1	2	1	0
D	5	1	1	0
Total	15	5	4	1

These data are reflective of national statistics in
that a great proportion of the elderly population live
alone (U.S. Bureau, 1976).

Number of Reported Illnesses

A list of specific illnesses was presented in the
Demographic Data Profile for each participant to signify
by a check next to an illness if he/she had experienced
that illness within the past five years. No data are

presented on the specific types of illnesses reported.
Seven of the total sample (28%) reported experiencing
from 0-2 illnesses. Fourteen (56%) participants indicated
experiencing from 3-5 illnesses and four individuals (16%)
reported experiencing 6 or more illnesses within the last
five years.

Number of Prescribed Medications

Table 11 summarizes the number of prescribed medications
being taken at the time of the study by the participants of
each site. The data portray a fairly equal distribution
among the sites.

Table 11

Number of Prescribed Medications Being Taken by
Participants, by Site Location

Site Location	Number of Prescribed Medications			
	One	Two	Three	Four or More
A	0	3	3	0
B	3	2	2	1
C	1	0	2	1
D	2	1	1	3
Total	6	6	8	5

Knowledge About Wise Drug Use

A pretest was given to each of the participants in order to obtain an objective measurement of the level of knowledge about wise medication use. This instrument measured knowledge on an interval level of measurement. This test was readministered as the posttest one week after the presentation of the film and the discussion of the information booklets. Table 12 summarizes the mean pretest and posttest scores by site location. The possible range of scores was 0-10.

Table 12

Knowledge Pretest and Posttest Means by Site Location

Site Location	Knowledge Pretest Mean	Knowledge Posttest Mean
A	7.25	7.25
B	7.87	7.12
C	7.33	7.33
D	7.71	6.86

Self-Reporting of Medication Compliance

The Self-Reporting Profile was utilized to obtain objective data about the participants' own perceptions of their medication compliance. Table 13 reports the median

pretest and posttest scores by site location. The possible
range of scores on this test was 0-24.

Table 13

Self-Reporting of Medication Compliance Median Pretest
and Posttest Scores by Site Location

Site Location	Self-Reporting Compliance	
	Pretest Score Median	Posttest Score Median
A	21.5	23.5
B	23.0	24.5
C	24.2	24.2
D	24.0	22.0

The Pill Count as a Measure of Medication Compliance

The Pill Count Record was the form used to document,
manually, the actual number of medicines being taken by the
participants. It was assumed that these medications
actually were taken by the participants.

The percentage compliance score was obtained by
dividing the number of pills that should have been taken
into the number of pills that actually were taken. This
calculated number then was multiplied by 100 to obtain a
percentage. An effort was not made to differentiate those
who over-medicated and those who under-medicated.

The range of scores for this measurement of compliance was 0-100%. The mean pre-treatment score for the total sample was 72.28%; median 78%; mode 100%. The mean post-treatment pill count score was 71.60%; median 71.25%; mode 86.0%. Table 14 illustrates mean pre- and post-tréatment pill count scores, by site location.

Table 14

Pre- and Post-Treatment Pill Count Percentage Means
by Site Location

Site Location	Pill Count Percentage Mean	
	Pre-Treatment	Post-Treatment
A	81.00	81.75
B	81.37	86.25
C	52.50	41.33
D	73.86	71.57

Inferential Analysis

This section first discusses the testing of Hypothesis One: A structured educational program will improve the partitipants' knowledge about wise medication use. Following this is a discussion of other findings identified through inferential analysis.

Analysis of variance was performed to determine if significant differences existed between groups in relation

to the Knowledge Pretest Score Means and Knowledge Posttest Score Means and the Pre- and Post-Treatment Pill Count Percentage Means. The statistical test, analysis of variance for repeated measures, was used. Table 15 summarizes the analysis of variance between groups for the dependent variables of Knowledge Pretest Mean and Knowledge Posttest Mean.

Table 15

Summary of Analysis of Variance Between Groups
Knowledge Pretest and Posttest Score Means

Source of Variance	Sum of Squares	Degrees of Freedom	Mean Square	F	Tail Probability
Between Groups	2520.1	1	2520.1	416.6	0.000
Interaction	0.5	3	0.2	0.03	0.994
Error	127.0	21	6.0	--	--
Across Trials	1.8	1	1.8	1.7	0.205
Interaction	1.9	3	0.6	0.6	0.631
Error	23.2	21	1.1	--	--

As noted in Table 15, there was no significant difference across the time trials.

A significant difference was found between sites by use of analysis of variance on Knowledge Pretest and

Posttest Score Means (p = 0.000). Therefore, the Tukey
Post-Hoc Test was used to determine if significant differ-
ences existed between the individual sites on the Knowledge
Posttest Scores. With df = 4,21; the critical value was
3.96. No significance was found between Site A and Site B
(the urban sites). However, a significant difference was
found to exist between Site C and Site D (the rural sites).
The calculated value was 9.71. Table 16 illustrates the
analysis of variance for the Pre-Treatment and Post-
Treatment Pill Count Percentage Means.

Table 16

Summary of Analysis of Variance Between Groups
Pre-Treatment Pill Count Percentage Mean and
Post-Treatment Pill Count Percentage Mean

Source of Variance	Sum of Squares	Degrees of Freedom	Mean Square	F	Tail Probability
Between Groups	240356.3	1	240356.3	362.1	0.000
Interaction	9336.7	3	3112.2	4.69	0.012
Error	13937.6	21	663.7	--	--
Across Trials	10.7	1	10.7	0.07	0.794
Interaction	262.7	3	87.6	0.57	0.641
Error	3227.9	21	153.7	--	--

A significant difference was found between groups for the Pre-Treatment and Post-Treatment Pill Count Percentage Means (p = 0.000). Again, the Tukey Post Hoc Test was used to identify where significant differences existed between the individual groups on the Post-Treatment Pill Count Percentage Mean. No significant difference was found between the urban Sites A and B. However, with $\underline{df}$ = 4,21, and a critical value of 3.96, a significant difference was noted between the rural sites C and D on the Post-Treatment Pill Count Scores (calculated value was 5.09).

The Kruskal-Wallis One-Way ANOVA was performed to determine whether the Posttest Self-Reporting Score Median for each group significantly differed. The chi square was calculated to be 3.817 with p = 0.282. Therefore, it was considered that these differences in scores were not statistically significant differences.

The Kruskal-Wallis One-Way ANOVA also was used to determine if any significant differences existed between the Self-Reporting Posttest Scores and the demographic variables of race, marital status, religion, employment status, socioeconomic status, living arrangement, number of illnesses and number of prescribed medications. No significant differences were found to exist between the Self-Reporting Posttest Scores and any of these variables as summarized in Table 17.

Table 17

Summary Table for the Analysis of Variance for Self-Reporting
Posttest Scores for the Variables of Race, Marital Status,
Religion, Employment Status, Socioeconomic Status, Living
Arrangement, Number of Illnesses and Number
of Prescribed Medications

Self-Reporting Posttest Score by	Chi Square (χ^2)	Significance (p)
Race	1.290	0.256[NS][a]
Marital Status	1.206	0.547[NS]
Religion	0.426	0.808[NS]
Employment Status	2.629	0.269[NS]
Socioeconomic Status	0.120	0.729[NS]
Living Arrangement	1.081	0.582[NS]
Number of Illnesses	1.609	0.205[NS]
Number of Prescribed Medications	0.457	0.928[NS]

[a]NS = not significant

The Mann-Whitney U Test was performed to analyze the
difference between the Self-Reporting Posttest Scores and
the variable of sex. A calculated $\underline{Z}$ of -2.420, two-tailed
$\underline{p}$ = 0.016 was obtained signifying a significant difference
between these two variables. The male participants
experienced a higher mean rank than the female subjects.

The ANOVA was utilized again in order to determine if
significant differences existed between the Knowledge

Posttest Scores and the demographic variables of race,
marital status, religion, educational background, employment
status, socioeconomic status, living arrangements, number
of illnesses, and number of prescribed medications.
Table 18 summarizes the analysis of variance for these
variables. As the table indicates, no significant differ-
ences were found.

Table 18

Summary of Analysis of Variance Between Groups for Knowledge
Posttest Scores and the Variables of Race, Marital Status,
Religion, Educational Background, Employment Status,
Socioeconomic Status, Living Arrangements, Number
of Illnesses and Number of Medications

Knowledge Posttest Score and Demographic Variables	Sum of Squares	Degrees of Freedom	Mean Square	F	Significance
Race	0.169	1	0.169	0.051	.8234
Marital Status	11.867	2	5.933	2.015	.1572
Religion	0.729	2	0.364	0.106	.9002
Educational Background	21.231	3	7.077	2.682	.0730
Employment Status	1.023	2	0.512	0.149	.8625
Socioeconomic Status	3.682	1	3.682	1.161	.2925
Living Arrangements	9.890	3	3.297	1.037	.3965
Number of Illnesses	3.569	2	1.784	0.537	.5919
Number Prescribed Medications	5.107	3	1.702	0.500	.6865

To determine if significant differences existed between the Post-Treatment Pill Count Scores and the demographic variables of race, marital status, religion, educational background, employment status, socioeconomic status, living arrangement, number of illnesses and number of prescribed medications, the ANOVA test was performed. It was found that no significant differences existed between the above cited variables and the compliance pill count score.

Correlations

The following correlational findings reflect the testing of Hypotheses Two and Three:

Hypothesis 2: Knowledge about aspects of correct medication-taking behavior is positively associated with medication compliance.

Hypothesis 3: Selected demographic variables are associated with medication compliance.

A Spearman Correlation Coefficient was computed to determine if a relationship existed between Knowledge Posttest Scores and the Self-Reporting Posttest Scores. A significant association was not found (Spearman's rho = 0.0964; p = .323). This same test was used to analyze the association between the Post-Treatment Pill Count Scores

and the Self-Reporting Posttest Scores. Again, a significant correlation was not found (Spearman's rho = 0.2631; p = .102).

Using the Spearman rho correlation test, no significant associations were found between the Self-Reporting Posttest Scores and the variables of age, educational background, number of illnesses, and number of prescribed medications.

A Pearson Product Moment Correlation Coefficient was calculated to examine the association between the Post-Treatment Pill Count Scores and the demographic variables of age, educational background, number of illnesses and number of prescribed medications. No significant associations were found to exist between the above stated variables.

Analysis of association between the Knowledge Posttest Scores and the above cited demographic variables indicated a significant correlation between age and the Knowledge Posttest Scores (r_s = -0.4739; p = .008) and between educational background and the Knowledge Posttest Scores (r_s = 0.5255; p = 0.003).

Summary

The findings presented in this chapter can be summarized as follows:

1. Of a total sample of 25, 11 persons (44%) represented the Rural Nutrition Sites and 14 persons (56%) represented the Urban Nutrition Sites.

2. The racial characteristics of the sample included 68% Black participants and 32% White participants. Males accounted for 36% of the sample; females, 64%.

3. The ages of the participants ranged from 60 years to 100 years. The mean age of the male participants was consistently higher than the females.

4. A majority of the subjects was widowed.

5. Twenty-two subjects (88%) had an educational background level of from 0-12 years. Only two participants were high school graduates and one individual was a business/technical school graduate.

6. A majority of the subjects was retired/not working. Also, a majority of the sample reported a monthly income of less than $400.

7. Fifteen subjects (60%) reported to be living alone, five persons (20%) lives with his/her spouse, four partici-pants (16%) were living with his/her children, and one person (4%) reported to be living with another relative.

8. Seven participants (28%) reported having experienced from 0-2 illnesses within the last five years. Fourteen subjects (56%) indicated from 3-5 illnesses and four persons (16%) reported six or more illnesses.

9. A majority of the sample (58%) was taking three or more medications at the time of the study.

10. Of the experimental groups, Site C, the rural experimental group, had the highest Knowledge Pretest Score Mean (7.33). This score remained the same for the Knowledge Posttest Score Mean. The Knowledge Pretest and Posttest Score Means of Site A, the urban experimental group, also remained the same (7.25).

11. Of the experimental groups, Site C reported to be more compliant than Site A, as indicated in Table 13. After presentation of the film and booklets, both of the experimental groups increased their subjective scoring on medication compliance.

12. Both sites C and D showed a decrease in medication compliance (Post-Treatment) as indicated by the Pill Count Percentage Means. Sites A and B improved in compliance rates on this measure.

13. A significant difference was found to exist between groups upon analysis of variance for the Knowledge Pretest and Posttest Score means.

14. A significant difference was found to exist between groups for the Pre- and Post-Treatment Pill Count Percentage Means at the 0.05 level of significance.

The Post-Treatment Pill Count Percentage Mean of Site C, the rural experimental group, was significantly

higher than the Post-Treatment Pill Count Percentage Mean
of Site D, the rural control group.

15. No significant difference was found between groups
for the Self-Reporting Posttest Scores.

16. No significant differences were noted to exist
between the Self-Reporting Posttest Scores and the demo-
graphic variables of race, marital status, living arrange-
ments, number of illnesses, and number of prescribed medi-
cines.

17. A significant difference was noted between the
Self-Reporting Posttest Scores and the sex of the partici-
pants, meaning that the male participants scored higher
than the females.

18. No significant differences were noted to exist
between the Knowledge Posttest Scores and the demographic
variables of race, marital status, religion, employment
status, socioeconomic status, living arrangements, number
of illnesses and number of prescribed medications.

19. No demographic variables were found to be
significantly associated with the Self-Reporting Measure
of compliance.

20. No demographic variables were found to be
significantly related to the Post-Treatment Pill Count
measure of medication compliance.

21. A significant inverse relationship was found to exist between the Knowledge Posttest Scores and the age of the participants (r_s = -0.4739; p = 0.008).

22. A significant positive relationship was found to exist between the Knowledge Posttest Scores and the educational level of the participants (r_s = 0.5255; p = 0.003).

CHAPTER 5

SUMMARY OF THE STUDY

Medication compliance is a multifactorial health problem whose determinants are not easily identified nor whose solutions are easily accomplished. Because a great percentage of the elderly population is responsible for the self-administration of medications at home, health care providers are becoming increasingly concerned about their compliance behavior. The purpose of this applied, evaluative study was to answer the following research questions:

1. What is the relationship between knowledge about taking drugs wisely and actual drug compliance behavior of a select group of elderly persons who self-administer prescribed medications?

2. How will a specific educational program affect drug compliance of this select group?

3. Do selected demographic variables correlate with medication compliance?

This investigation also tested the following hypotheses:

1. A structured educational program will improve the participants' knowledge about wise drug use.

2. Knowledge about aspects of correct medication-
taking behavior is positively associated with medication
compliance.

3. Selected demographic variables are associated
with medication compliance.

Summary

A stratified random sampling technique was used in
this investigation. From this procedure, two Urban
Nutrition Sites and two Rural Nutrition Sites were
selected for study. These Nutrition Sites are federally
funded and are under the direct supervision of the Area
Agency on Aging (AAA) which is a division of the Houston-
Galveston Area Council (H-GAC). The final total study
sample consisted of 25 persons, 60 years of age and over,
who attended these Nutrition Sites and who met the pre-
established criteria for inclusion in this study.

Demographic data, knowledge of wise drug use practices
and self-reporting of medication compliance were assessed
through the use of the Demographic Data Profile, the
Knowledge Profile, and the Self-Reporting Profile. On
this same day of data collection, a baseline pill count
was conducted and recorded on the Pill Count Record. One
week later the experimental groups received the treatment,
which included the presentation of a 30-minute film

entitled "Wise Use of Drugs: A Program for Older Americans"
and the discussion of the informational packets. The con-
trol groups received this information after this study was
completed. Again, one week later, the Knowledge Profile
and the Self-Reporting Profile were readministered as the
posttest. A total of three pill counts were conducted for
each subject.

Discussion of Findings

Analysis of demographic data indicated the sample to
be predominantly Black females. White males were the
least represented group within the sample (12%). The mean
age of the sample was 74.6; median 74; mode 71. The mean
age of the male participants, 80.4, was considerably higher
than the mean age for females, 71.1. The findings related
to marital status indicated that 28% of the sample was
married, 68% was widowed, and 4% of the sample was divorced.
A majority of the sample, 72%, was of a Protestant religious
affiliation. Only 8% was Catholic and 20% of the sample
had no particular religious affiliation. Only 12% of the
total sample had obtained an educational level of high
school graduate or better; 88% had less than 12 years of
educational background, and one half of these persons had
less than seven years of school. A majority of the study

sample was retired/not working and had monthly incomes of less than $400.

At the time of the study, 24% of the sample was taking only one prescription medication and another 24% was taking only two prescribed medications. Three prescription medications were being taken by 32% of the sample and 20% reported to be taking four or more prescribed medications.

The control groups had a higher Knowledge Pretest Mean (7.79) as compared to the experimental groups (7.29). However, the control groups' Knowledge Posttest Mean dropped considerably to 6.99 and the experimental groups' Knowledge Posttest Means remained at 7.29. The reason for the drop in the mean score for the control group may be that the posttest was a direct repetition of the pretest. Having had no educational intervention between the tests, the attitudes of the subjects about taking the same test may have caused a lesser concern among the participants about answering correctly.

Over one half of the sample self-reported (post-treatment) to be 100% compliant; however, only 12% of the sample proved to be 100% compliers as measured by the pill counts. For the urban experimental group, Site A, the pill count compliance measure increased from 81.00 to 81.75 after the presentation of the educational program. Although this increase was not found to be statistically significant,

it is evidence that medication compliance in the experimental group did improve. Site C's compliance rates did not improve post-treatment. This group's initial poor compliance rate of 52.50 may have influenced the poor compliance rate throughout the study.

Upon analysis of variance between groups for the variables of Knowledge Pre- and Posttest Score Means, a statistically significant difference was found to exist. Also, a statistically significant difference was found to exist between groups for the variables of Pre- and Post-Treatment Pill Count Percentage Means. This finding supports the assertion that a structured educational program will improve medication compliance rates.

Structured education has been a strategy used in several research studies dealing with medication compliance. Tagliacozzo, Luskin, Lashof, and Ima (1974) and Hecht (1974) found that education measures helped to increase a person's knowledge, yet none of them improved actual medication compliance.

In this research study, no demographic variables were found to be significantly associated with medication compliance. Marston (1970) performed a detailed review of the literature on medication compliance and concluded that demographic variables rarely have been predictive of compliance with medical recommendation.

It was interesting to find that the age of the subjects related inversely to knowledge about wise drug use practices. This means that the older participants exhibited less knowledge about wise drug use.

Conclusions and Implications

Statistical analysis of the collected data has revealed that a significant difference existed between the Rural Experimental and Rural Control Groups Post-Treatment Pill Count Percentage Scores. Medication compliance did improve for the urban experimental group, Site A; however, this did not appear to be statistically significant.

Of particular importance is the finding that many of the participants self-reported to be compliant, yet very few actually displayed compliant behavior as recorded on the pill count records. This is an important fact of which health care practitioners should be aware. Although persons may verbalize an intention to comply, the practitioner must be keenly aware of the discrepancies which have been shown to exist between what the person says she/he will do and what actually occurs (Davis, 1968).

The content of the film and educational packets may have been somewhat difficult for many of the participants to fully comprehend. Also, the main eating rooms of the

Nutrition Sites were not at all times conducive to learning in that a few of the rooms could not be darkened to allow for adequate visualization of the film. In addition, the acoustics of a few of these rooms were very poor.

Throughout the study, many positive statements were made by the subjects about the program. Remarks such as "I really learned a lot" and "I enjoyed the film" implied specific positive reactions to the program. However, the findings suggest that transmitting information alone is not enough to overcome noncompliance.

Recommendations

The following recommendations for future research are made based on the findings of this study and on the problems encountered in conducting the research:

1. Trials of strategies for improving compliance should include measurements of the subjects' self-perceptions, attitudes, toward health and of their social and emotional function, both before and after the experimental treatment.

2. The need for further investigations of the specific reasons given by individuals for their noncompliance or compliance behavior.

3. A follow-up study to investigate the correlations proposed over varying periods of time to evaluate changes in both knowledge and medication compliance.

4. Replication of the study utilizing elderly persons who are first-diagnosed with a chronic illness.

5. Further investigation to evaluate educational strategies employed to improve compliance behavior.

6. Nurses should conduct and/or participate in more controlled studies of nursing interventions to enhance compliance behavior.

7. The need for more research dealing with compliance as related to patient outcomes.

APPENDIX A

ELDER-ED PACKET

Elder-Ed

An Education Program
for Older Americans

USING
MEDICINES
WISELY

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service
Alcohol, Drug Abuse, and Mental Health Administration

Booklets:
1. "Passport to Good Health Care"
2. "Saving Money with Generic Medicines: Can You? Should You?"
3. "Do's and Don'ts of Wise Drug Use"
4. "Using Your Medicines Wisely: A Guide for the Elderly"
5. "Keeping Track of Your Medications"

APPENDIX B

NUTRITION SITES

H-GAC AAA NUTRITION SITES

Urban	Rural
Freeport	Palacious
La Marque	Wharton
Brazoria	Van Vleck
Rosenberg	Bay City
M. I. Lewis	El Campo
Nessler	
Hitchcock	
Kempner	
Wessley	
Liberty	
Conroe	
New Caney	
Woodlands	
Jerusalem	
Arcola	
Kendleton	

APPENDIX C

HUMAN RESEARCH REVIEW COMMITTEE APPROVAL

AND AGENCY PERMISSION FORM

TEXAS WOMAN'S UNIVERSITY
HOUSTON CAMPUS
HUMAN RESEARCH REVIEW COMMITTEE
REPORT

STUDENT'S NAME___Donna Gauthier Rabalais_____

PROPOSAL TITLE___"An Evaluation: Medication Use of_____

___Participants of Urban and Rural Nutrition Sites"_____

_____

COMMENTS:_____

_____

_____

_____

_____

_____

_____

DATE: ___Mar. 14, 1980___

~~Disapprove~~ _____ Approve

~~Disapprove~~ _____ Approve

~~Disapprove~~ _____ Approve

~~Disapprove~~ _____ Approve

TEXAS WOMAN'S UNIVERSITY
COLLEGE OF NURSING
DENTON, TEXAS 76204

DALLAS CENTER
1810 INWOOD ROAD
DALLAS, TEXAS 75235

HOUSTON CENTER
1130 M. D. ANDERSON BLVD.
HOUSTON, TEXAS 77025

AGENCY PERMISSION FOR CONDUCTING STUDY*

THE Houston-Galveston Area Council

GRANTS TO Donna Rabalais

a student enrolled in a program of nursing leading to a Master's Degree at Texas Woman's University, the privilege of its facilities in order to study the following problem:
The effect of the "Elder-Ed." program on drug compliance and knowledge of the wise use of drugs among the elderly.

The conditions mutually agreed upon are as follows:

1. The agency (may) (xxxxxxxx) be identified in the final report.

2. The names of consultative or administrative personnel in the agency (xxxx) (may not) be identified in the final report.

3. The agency (wants) (xxxxxxxxxxxxx) a conference with the student when the report is completed.

4. The agency is (willing) (xxxxxxxx) to allow the completed report to be circulated through interlibrary loan.

5. Other_____

_____

_____

Date: March 17, 1980 _____

Signature of Agency Personnel

Donna G. Rabalais
Signature of Student

Signature of Faculty Advisor

* Fill out and sign three copies to be distributed as follows: Original-Student; First copy - agency; Second copy - TWU College of Nursing.

GP:GEN 13
07026074 cd

APPENDIX D

DEMOGRAPHIC DATA PROFILE

DEMOGRAPHIC DATA PROFILE

The first part of this survey requires some specific information about yourself. Please do not sign the survey. No one will know how you answered these questions but you. Please answer all questions truthfully.

1. How old were you on your last birthday?

    _____

2. Are you
    A. ____Black?
    B. ____Mexican-American?
    C. ____White?
    D. ____Other?

3. Are you
    A. ____Male?
    B. ____Female?

4. Are you presently
    A. ____Married?
    B. ____Widowed?
    C. ____Divorced?
    D. ____Separated?
    E. ____Single (Never Married)?

2

5. WHAT RELIGION ARE YOU?
   A. ____CATHOLIC
   B. ____JEWISH
   C. ____PROTESTANT
   D. ____OTHER
   E. ____NONE

6. HOW MANY YEARS DID YOU GO TO SCHOOL?
   A. ____0-6
   B. ____7-12
   C. ____HIGH SCHOOL GRADUATE
   D. ____BUSINESS/TECHNICAL SCHOOL GRADUATE
   E. ____1-3 YEARS OF COLLEGE
   F. ____COLLEGE GRADUATE OR MORE

7. ARE YOU
   A. ____EMPLOYED FULL TIME?
   B. ____EMPLOYED PART TIME?
   C. ____NOT WORKING/RETIRED?

8. PLEASE CHECK THE AMOUNT OF MONEY YOU YOURSELF RECEIVE
   EACH MONTH BEFORE TAXES ARE TAKEN OUT.
   A. ____$100-$399
   B. ____$400-$999
   C. ____$1000 OR MORE

3

9. Do you live
   A. ____By yourself?
   B. ____With your spouse?
   C. ____With one of your children?
   D. ____With another relative?
   E. ____With your spouse and child?
   F. ____With a friend?

10. What major problems have you had in the past 5 years?
    A. ____Heart problems
    B. ____High blood pressure
    C. ____Eye, ear, nose, or throat problems
    D. ____Hardening of the arteries
    E. ____Broken bones
    F. ____Arthritis
    G. ____Kidney problems
    H. ____Depression
    I. ____Dizziness
    J. ____Sleeplessness
    K. ____Diabetes
    L. ____Asthma
    M. ____Nerves
    N. ____Stress
    O. ____Other (Specify) _____
    P. ____None

4

11. DOES YOUR DOCTOR HAVE YOU TAKE ONE OR MORE MEDICINES REGULARLY?

    A. ____YES

    B. ____NO

12. IF YOUR DOCTOR HAS YOU TAKE ANY MEDICINE, HOW MANY?

    A. ____1

    B. ____2

    C. ____3

    D. ____4

13. DO YOU TAKE YOUR MEDICINES WITHOUT HELP FROM ANYONE?

    A. ____YES

    B. ____NO

14. DO YOU SHOP AT ONE DRUG STORE REGULARLY WHEN YOU HAVE YOUR PRESCRIPTION FILLED OR DO YOU USE SEVERAL?

    A. ____ONE

    B. ____MORE THAN ONE

15. WHAT TIMES DURING THE DAY DO YOU TAKE YOUR MEDICINES?

    _____

APPENDIX E

SELF-REPORTING PROFILE

SELF REPORTING PROFILE

THIS PART OF THE QUESTIONNAIRE REQUIRES INFORMATION FROM
YOU ABOUT YOUR MEDICATION HABITS AND BELIEFS. PLEASE DO
NOT SIGN THE QUESTIONNAIRE. NO ONE WILL KNOW HOW YOU
ANSWERED THE QUESTIONS, BUT YOU. PLEASE ANSWER ALL THE
QUESTIONS TRUTHFULLY.

1. DO YOU TAKE YOUR MEDICINES EXACTLY AS PRESCRIBED FOR
   YOU?
   A. _____YES
   B. _____SOMETIMES
   C. _____NO

2. DO YOU FORGET TO TAKE YOUR PRESCRIBED MEDICINES?
   A. _____YES
   B. _____SOMETIMES
   C. _____NO

3. DO YOU TAKE YOUR MEDICINES WITH YOU WHEN YOU TAKE A
   TRIP OR A VACATION?
   A. _____YES
   B. _____SOMETIMES
   C. _____NO

4. Do you take fewer pills than the doctor ordered?
   A. _____Yes
   B. _____Sometimes
   C. _____No

5. Do you ever let a few days go by before taking your empty medicine bottle to get it refilled?
   A. _____Yes
   B. _____Sometimes
   C. _____No

6. Do you ever skip a dose of your medicines?
   A. _____Yes
   B. _____Sometimes
   C. _____No

7. Do you take the exact number of pills that your doctor ordered?
   A. _____Yes
   B. _____Sometimes
   C. _____No

8. Do you keep taking your regularly prescribed medicines on the days that you feel "good".
   A. _____Yes
   B. _____Sometimes
   C. _____No

APPENDIX F

KNOWLEDGE PROFILE

KNOWLEDGE PROFILE

1. Should you take a written list of questions with you to the doctor?

   A. _____Yes

   B. _____No

2. If you see more than one doctor, is it important for ONLY ONE doctor to know all of the medicines you are taking?

   A. _____Yes

   B. _____No

3. Should you ask your doctor questions about how to take your medicines?

   A. _____Yes

   B. _____No

4. Should you ever share your pills with anyone?

   A. _____Yes

   B. _____No

5. Is it harmful to your health to drink alcohol while taking certain medicines?

   A. _____Yes

   B. _____No

6. SHOULD YOU CARRY A LIST OF THE MEDICINES THAT YOU
   ARE TAKING WITH YOU WHEN YOU GO TO SEE A DOCTOR?
   A. _____YES
   B. _____NO

7. SHOULD YOU TAKE YOUR MEDICINES WITH YOU ON VACATIONS
   AND TRIPS AWAY FROM HOME?
   A. _____YES
   B. _____NO

8. WHEN YOU START FEELING BETTER, SHOULD YOU STOP TAKING
   YOUR PILLS WITHOUT INSTRUCTIONS FROM YOUR DOCTOR?
   A. _____YES
   B. _____NO

9. SHOULD YOU TELL ALL OF THE DOCTORS YOU VISIT ABOUT
   ALL OF THE MEDICINES YOU ARE TAKING?
   A. _____YES
   B. _____NO

10. BELOW IS A SAMPLE PRESCRIPTION LABEL.

        A-B-C PHARMACY

        _TAKE AS DIRECTED_____

    CHOOSE THE CORRECT WAY OF TAKING THE MEDICINE.
    A. _____TAKE ONE TABLET A DAY
    B. _____TAKE TWO TABLETS A DAY
    C. _____CALL YOUR DOCTOR THEN WRITE DOWN THE DIRECTIONS
            AND TAPE THEM TO YOUR BOTTLE.

APPENDIX G

PILL COUNT RECORD

PILL COUNT RECORD

Drug Name	Instructions on Bottle	#1 Pill Count # of Pills in Bottle	#2 Pill Count X/Y[a]	#3 Pill Count X/Y[a]	Remarks

[a]X = number of pills in medicine bottle; Y = number of pills that should be in the medicine bottle.

APPENDIX H

CORRESPONDENCE AND WRITTEN PERMISSION

FOR USE OF INSTRUMENT

February 22, 1980

Ms. Bobbie Affleck
Health Survey Coordinator
Heart of Texas Council of Governments
3rd Floor   700 Austin Avenue
Waco, Texas   76701

Dear Ms. Affleck:

Enclosed are three written permission forms for each of the graduate students involved in the evaluation of the Elder-Ed Program. Thank you very much for your assistance.

The comments that you made on your revised Health Survey have proven very beneficial to us. Enclosed is a copy of the instruments we have developed for use in our studies.

Again, thank you very much for your help. As the study progresses, we will keep in contact to let you know how the project is advancing.

Sincerely,

Donna Rabalais

Halyna Stegura

Mary K. Bahnsen

Mary E. Benedict, RN, MSN
Faculty
Thesis Chair

DR:rs

I, the undersigned, grant permission to Donna G. Rabalais to use questions and modified questions of the survey developed by me entitled "MEDICINE USE STUDY AMONG PERSONS 60 AND OVER AT SENIOR CENTERS IN THE HOTCOG REGION."

Bobbie Affleck
Ms. B. Affleck

_3-3-80_
Date

APPENDIX I

ORAL CONSENT FORM

ORAL INFORMED CONSENT

Research suggests that the elderly are the most prescribed-to group of consumers in the United States. Therefore, they tend to experience more problems with taking their prescription medicines.

I, Donna Rabalais, am a graduate nurse and a student at Texas Woman's University. In fulfilling my master's degree requirement, I am conducting a study to find out if you are having any problems with taking your prescribed medicines and what kinds of problems you may be having.

This study will take place over a period of three weeks, one day each week. You will be asked to bring in your prescription medicines on specific days. I will keep a record of your pills on each of these days. Also I will provide special bags in which you can bring your medicines to the nutrition site and then back home.

You will be asked to fill out three separate questionnaires which should take about 15-20 minutes. During my second visit to the nutrition site, you will be shown a film entitled <u>Wise Use of Drugs: A Program for Older Americans</u>. An information booklet will be given to all participants.

Your name will not appear on any of the questionnaires. Your name will not be used in any release of the data and you are free to withdraw from the study at any time.

In transporting your medicines to and from the nutrition site, there is the possibility of your misplacing them. However, specially labeled brown bags will be given to help in keeping your medicines together.

This education program may prove beneficial to you. The film and booklets may help to solve some of your problems in taking prescription medicines.

I must add that no medical service or compensation is provided to the participants by Texas Woman's University as a result of injury from participation in this study. I will be glad to answer any questions you may have about the study.

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136

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