

EFFECTIVENESS OF ELDER-ED PROGRAM ON KNOWLEDGE
AND MEDICATION COMPLIANCE: AN EVALUATION

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DEDICATION

This work is lovingly dedicated to
my husband, Michael.

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CHAPTER 1

INTRODUCTION

In the past generation medical technology has advanced tremendously, prolonging existing life expectancy. At present, in the United States, there are over 24 million elderly people; by the year 2000, there are expected to be over 48 million people 65 years of age or older. In 1970, Texas statistics showed that there were just under one million people in the state over 65 years of age. Predictions are that this number will increase to over 1,600,000 by the year 2000 (Price & Martindale, 1978).

Due to the ever-increasing life span of many individuals, there is an increased need for maintaining an adequate level of health for these individuals for a longer number of years. This extended life span also results in increased chronic illness. Maintaining individuals with chronic illness at an adequate level of health requires increased consumer education as well as increased numbers of prescribed medications. Since the elderly population is the most prescribed to group of people, drug compliance among this segment of the population warrants priority attention from health providers. Although the elderly

population is increasing, 95% of this population is non-institutionalized (Plant, 1977). The elderly have varying degrees of self-participation in their health care. Consumer knowledge is an essential component in making wise judgments regarding one's own health care.

This study is part of a cluster study in which three researchers collected separate data for separate theses. The content of the research design, instruments, and oral informed consent are identical in these cluster studies.

Problem of Study

There is a need to know: What is the relationship between knowledge about taking drugs wisely and drug compliant behavior among a select group of elderly people who self-administer drugs? How does a specific education program affect drug compliance of a select group of elderly persons? Is there any correlation between certain demographic factors and drug compliance?

Justification of Problem

Consumer education is an identified nursing role. Studies (Hecht, 1974; Leary, Vessella & Yeaw, 1971) showed a positive relationship between knowledge about one's medications and medication compliance.

Another study (Schwartz, Henley, & Zeitz, 1964) indicated that elderly people do have problems taking their medications correctly. Some of the variables affecting correct medication taking are the number of prescribed medications, the person's perception of illnesses, and household composition where the elderly person resides. Neeley's and Patrick's (1968) study supported Schwartz' findings, except those on household composition.

Reviewing the literature only points out the need to continue exploring the subject of drug compliance, because no consensus has been reached on the variables affecting it. The topic requires further investigation into the complex mechanisms affecting drug compliance.

Conceptual Framework

The Neuman Model provided the conceptual framework for this study. It represents the attainment and maintenance of a maximum level of total wellness by purposeful intervention to reduce stress and adverse conditions (Neuman, 1974).

Some of the assumptions identified by Betty Neuman (1974) for the model are the following:

1. Man is an open system and total person affected by many variables.
2. In order to survive, man's basic energy structure must be intact.

3. Every man has an individualized normal line of defense.

4. The strength of man's dynamic flexible line of defense and lines of resistance are affected by physiologic, psychologic, sociocultural and developmental variables.

5. Prevention can occur at the primary (assessment and prevention), the secondary (diagnosis and treatment), or the tertiary (readaptation and reconstitution) levels.

The model's central focus revolves around man's basic energy structure. The normal line of defense refers to man's adapted state of wellness. If the dynamic state of wellness, the flexible line of defense, allows penetration of a stressor, the stressor will affect the normal line of defense and proceed with penetration. Stressors originate from the intrapersonal, interpersonal, and extrapersonal environments, which are affected by man's physiologic, psychologic, sociocultural and developmental states. Illness is considered to be a stressor for which, in many instances, medications are prescribed.

The prevention concept is very operational in nursing practice. Primary prevention occurs in the area of prevention or reduction of the encounter with stress. Learning about taking medications wisely before being on a medication regime can be considered primary prevention. Secondary

prevention relates to early case finding and treatment. Persons already on medications can be considered to be in this category. Tertiary prevention applies to readaptability and maintenance of stability.

Medication compliance is a self-care behavior. Self-care is an adult's personal, continuous decision and action contribution to his own health and well-being (Orem, 1971). Self-care is a learned behavior from parents, friends, the community. One nursing role is to assist an adult in the absence of his own ability "to maintain for himself continuously that amount and quality of self-care which is therapeutic in sustaining life and health, in recovery from disease or injury, or in coping with the effects" (Orem, 1971, p. 2).

Assumptions

The assumptions for this part of the cluster study were:

1. Medication noncompliance is a health problem among the elderly.
2. Prescribed medications for certain elderly are necessary to promote and to maintain an adequate health status.
3. Knowledge of self-care is important for the elderly's welfare.

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

5. Compliance with a prescribed medication regimen is essential for a person's health.

Hypotheses

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

1. A structured education program will improve knowledge about taking drugs wisely among a select group of elderly persons who self-administer their drugs.

2. Knowledge about aspects of correct drug taking behavior is positively related to drug compliance in a select group of elderly persons who self-administer their drugs.

Definition of Terms

The following terms were 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 developed by the National Institute on Drug Abuse (1979) to encourage wise use of medications. In this study the program will include:

- a. A 30 minute film, Wise Use of Drugs: A Program for Older Americans, covering communication with physicians, buying drugs wisely, taking drugs carefully, and focusing on healthy aging.
 - b. Written booklets including: "Passport to Good Health," "Saving Money with Generic Medications: Can You, Should You?," "Do's and Don'ts of Wise Drug Use," "Using Your Drugs Wisely," and "Keeping Track of Your Medicines" (Appendix A).
3. Elderly--persons who are 60 years of age or older.
 4. Knowledge--specific information or facts which a person has about taking drugs wisely.
 5. Medication compliance--a measure of the person's accuracy in following a prescribed medication regimen.
In this study medication compliance will comprise:
 - a. Accurate pill counts
 - b. Accurate answers on questionnaires regarding self-reporting of compliant behavior.
 6. Noncompliance--a measure of the person's inaccuracy in following a prescribed medication regimen. In this study noncompliance will be determined by:
 - a. Admission of noncompliant behavior as noted on the self-reporting questionnaire
 - b. A discrepant pill count.

7. Nutrition sites--federally funded sites for providing nutritionally well-balanced noon meals to persons 60 years of age or older for a minimal cost, if any.

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

9. Rural site--outside the Standard Metropolitan Statistical Area (SMSA) of Houston. The Houston-Galveston Area Council (H-GAC) guidelines interpret this site as inaccessible to the Houston area.

10. Self-administration--the situation existing when a person is responsible for taking his/her own medication.

11. Urban site--within the SMSA of Houston. The H-GAC guidelines interpret this site to be accessible to the Houston area.

12. Wise drug usage--used interchangeably with medication compliance; based on a prescribed regimen.

Limitations

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

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

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

3. A certain amount of forgetfulness may have occurred in the elderly population possibly causing inaccurate answers on the questionnaires.

Summary

Medication noncompliance, as a health problem of the elderly, is becoming an increasing concern of health providers, particularly since the elderly are the most prescribed-to group of people and the elderly population is increasing. Much research has been done in the area of medication compliance and noncompliance, but the problem of noncompliance continues to exist.

This study attempted to determine if an association existed between a structured education program, the Elder-Ed program, and the participants' knowledge. The study further explored the association between the participants' knowledge and medication compliance before and after the treatment, the Elder-Ed program.

CHAPTER 2

LITERATURE REVIEW

Aging

All the world is a stage,
And all the men and women merely players;
They have their exits and their entrances,
And one man in his time plays many parts,
His acts being seven stages. At first the infant . . .

The sixth age shifts
Into the lean and slippered pantaloon
With spectacles on the nose and pouch on side;
His youthful hose, wellsaved, a world too wide
for his shrunk shrank, and his big manly voice,
Turning again toward childish treble, pipes
And whistles in his sound. Last scene of all,
That ends this strange eventful history,
Is second childishness and mere oblivion . . .
Shakespeare

The physical and psychological status of the aged person in society is alluded to by Shakespeare. The cultural aspect is very significant in understanding the attitudes toward aging in a specific society. Americans, generally, do not revere the aged as do the oriental cultures. But very few elderly fit the picture painted by Shakespeare. An examination of the prevailing physiologic and psychosocial aspects of aging may lead us in the direction of better understanding this class of people called the "aged."

The purpose of this study was to investigate the effectiveness of the Elder-Ed program on knowledge and compliance. Because of the large volume of relevant literature on this topic, the review of literature is not comprehensive but selected. The literature review is presented in four major sections. The first section discusses the physiological and psychological aging processes. Section two details general literature findings regarding the elderly and drugs. Some of the major aspects are cost, compliance, and drug absorption. In section three, compliance is presented in relation to noncompliant types of behavior, the different compliance measures and noncompliance error classification. Major emphasis is placed on the large number of variables found to correlate with noncompliance, many with questionable meaningfulness for the health professional. Section four develops the nursing role in educating consumers.

Physiologic Aging

Aging can be defined as "the underlying process that leads to an increased probability of illness" (Bierman & Hazzard, 1978, p. 22). Review of a select few of the many physiological and biological oriented theories of aging give direction toward understanding of the physiologic aging process.

The "wear and tear" theory still popular today explains that the normal process of aging occurs as a result of body deterioration due to constant use (Atchley, 1972; Kimmel, 1974; Murray & Zentner, 1975; Weiner, Brok & Snadowsky, 1978). This theory implies that parts of the body start to break down after being in constant use since conception. This may affect the attitude that keeping busy and active indicates that one is not yet aged and is healthy.

Another widely accepted aging theory concerns the concept of man as a biological energy system with a progressive decline of vigor and resistance with the passage of time (Bierman & Hazzard, 1978; Weiner et al., 1978). Some believe this thinking may lead to the disengagement theory of aging (Cumming & Henry, 1961) which postulates that the elderly withdraw from society and prefer to live in the past (Weiner et al., 1978).

Physiologic changes occur in different areas of the body systems of the aged persons. Aging occurs at various levels: organs and organ systems, tissue cells, subcellular particles and molecules (Bierman & Hazzard, 1978) producing progressive irreversible changes (Shock, 1974).

Research remains inconclusive regarding collagen alteration and its causal effect on aging (Murray & Zentner, 1975). Nonrenewable cells create a decrease in the number

of functioning cells. Cells do not show an infinite capacity for cell division (Bierman & Hazzard, 1978). Hayflick (1965; 1970) reported cells have a finite life span. Other research conflicts with these findings (Hayflick, 1979; Kohn, 1975).

To this date, research has not clearly indicated whether changes in DNA and RNA occur due to exhaustion of the genetic program, or if the changes occur randomly and accumulate with age (Kimmel, 1974). Jarvik and Cohen (1973) believed that the changes in the genetic matrix may have a connection with learning and memory.

According to Bierman and Hazzard (1978), research showed an approximate 1% decline per year in most integrated body functions. This results in a longer time requirement for readjustment to stress than for the younger person (Shock, 1974).

Physical appearances change as a result of physiologic changes occurring in the elderly during the aging process. The following usually are among these changes: decrease of pigment production by hair follicle cells causing gray or white hair; hair loss; slumping of posture due to dorsal kyphosis; loss of height; loss of cartilage leading to chronic osteoarthritis; visual defects; wrinkling due to loss of skin elasticity, wasting of

subcutaneous fat and supporting tissues; loss of teeth; hypertension with or without associated atherosclerotic and/or cardiovascular disease; constipation; varicose veins; decrease in muscular strength; impairment in coordination, vision and taste sensations (Hazzard & Bierman, 1978; Kimmel, 1974; Shock, 1974).

It is to be emphasized that one's chronological age does not highly correlate with the physiological changes occurring in the body (Jarvik, 1975). Significant individual differences are evident in the effects of age. Age affects different organ systems differently (Shock, 1974). And so, after consideration of the generally accepted aspects of physiologic aging, it is important to remember the individual characteristics of each elderly person.

Psychosocial Aspects of Aging

A link is apparent between the physical and psychosocial aspects of aging. Since impairments occur in many of the senses, the elderly's perception, reaction time, and speed and accuracy of response are decreased. The atherosclerotic changes in the brain, along with changes in the metabolic rate of the brain, affect intelligence, learning, memory, thinking, problem solving, and creativity capabilities of the aged (Atchley, 1972). The previously

cited physiologic changes usually do not hamper the psychological skills until very late in life (Atchley, 1972).

Much is expected of the elderly in respect to developmental tasks.

The three developmental tasks of later adulthood suggest a need for realistic balance between active engagement and contemplation. Some energy is directed toward experimentation with new roles which have had lower priority during middle adulthood years. The tasks of life acceptance and development of a point of view about death, which stimulate the process of evaluation and recollection, also require concerted energy. These tasks move the person toward a broader conceptualization of the meaning of life which can accommodate both personal failures and personal successes. Successful accomplishment of the tasks of later adulthood depends on the resilience, openness, and intellectual complexity of the adult. (Newman & Newman, 1975, p. 350)

Many theories have evolved on the psychological and social aspects of aging. Erikson's eight stages represent general age-related psychosocial personality development. The successful resolution occurring within each stage of development allows the individual to progress further in personality development (Weiner et al., 1978). In the stage Integrity versus Despair, which is the most prevalent stage in old age (Weiner et al., 1978), man accepts his own life with satisfaction (Murray & Zentner, 1975; Newman & Newman, 1975, Weiner et al., 1978), through the process of introspection (Newman & Newman, 1975). An appropriate

resolution of this conflict results in wisdom (Erikson, 1976; Weiner et al., 1978). Jung also believed that old age represents wisdom without clinging to the past (Jung, 1960).

Another theorist, Peck, extended Erikson's stages. Peck identified several differentiated periods of middle age and adult life. Some of the concerns of the middle age stages are valuing: wisdom versus physical powers, socialization versus sexualization, mental flexibility versus mental rigidity. Peck identified the old age stages as: ego differentiation versus work role preoccupation, body transcendence versus body preoccupation, and ego transcendence versus ego preoccupation (Lawton, 1974; Weiner et al., 1978).

Robinson (1978) suggested that three different classifications of approaches are seen in the elderly person's adaptation to old age. The disengagement approach is used when the elderly decrease their activity and retire to a slower pace of life. The maintenance of activity approach shows no behavioral changes taking place which can segregate the elderly from the middle aged. The maintenance of utility approach relates to usefulness and the ability to function in society. Individual differences in the aged

persons and the values of society affect the aged person's choice of approach to the adaptation to old age.

The aging years are affected by changes in role expectation, socioeconomic status, interpersonal and family relationships, leisure activity time, and other factors. All these changes, in conjunction with an individual's physiologic and psychologic aging process, create an "aged person" who is the focus of concern of many health professionals.

The Elderly and Drugs

The elderly population is ever increasing. Plaguing the elderly are chronic illnesses which require the use of prescription medicines. For these and many other reasons, health professionals exhibit increasing concern for the problems the elderly have regarding medications and medication taking. Medications are becoming more costly, and the elderly on fixed incomes spend 20% of their out-of-the-pocket expenditures for drugs (National Council, 1970).

In an exploratory study, Chien, Townsend and Townsend (1978) reported the extent of drug usage of prescription and nonprescription drugs of 242 elderly people residing in a New York state community. The study showed that 301 different drugs were being used by the 242 elderly subjects.

Each subject used a mean number of 3.8 drugs. Of the sample, 83% reported taking two or more drugs daily.

Fifty-five noninstitutional 60 year old and older retired persons were studied through interviews in respect to their drug usage and health characteristics (Vener, Krupka & Climo, 1979). The study results from central Michigan communities showed that the 37 participants who were on prescription drugs took 76 different drugs, averaging two prescriptions per person, 1.8 over-the-counter drugs, and 1.8 social drugs (alcohol, caffeine), totaling 5.6 drugs per person per day.

In decreasing frequency, the 10 conditions for which medication were used include: heart problems, high blood pressure, arthritis, mental and nervous conditions, gastrointestinal problems, urinary tract infections, diabetes, respiratory problems, circulatory problems, and chronic skin conditions (Lofholm, 1975). Vener et al. (1979) reported that arthritis, back or spinal trouble, high blood pressure, allergy and hemorrhoids were the five most frequently listed chronic diseases among the 60 year old and older men and women in their study group.

The elderly have some special problems relating to medicines and medication taking. The physiology of the elderly person creates different metabolism and absorption

rates of medication that can lead to different degrees of drug reactions. A clinical report presented by Lamy (1974) noted that 70-79 year old persons experienced seven times as many drug reactions as did 20-29 year olds. A study by Hurwitz (1969) revealed that significantly more subjects over 60 years of age experienced adverse drug reactions. This study dealt with the investigation of the 118 out of 1,160 subjects who developed adverse reactions to drugs.

Age associated changes affect drug absorption, distribution, metabolism and excretion (Bender, 1974; Lamy, 1974; Lamy & Vestal, 1976; Lenhart, 1976). A reduction or delay of drug absorption in the elderly is seen due to reduction in gastric juice acidity, a slowed stomach emptying rate, and a decrease in intestinal blood flow (Lamy, 1974). Impaired circulation and membrane permeability create a change in the distribution of the drug in the elderly (Bender, 1974). Age-related reduction in liver and kidney function need to be considered in the pharmacological prescribing for the elderly, since the liver and kidneys are the major organs for drug metabolism and excretion (Lamy, 1974; Lamy & Vestal, 1976; Smith, 1979). The age-related changes often lead to drug accumulation, toxicity, and overdosage (Lamy & Vestal, 1976; Lenhart, 1976). Other reasons for overdosing in the elderly can

occur due to loss of body weight resulting from fluid loss (Lenhart, 1976).

Almost one third of the adverse reaction in the elderly are related to digoxin toxicity (Smith, 1979). The use of thiazide diuretics, often prescribed to the elderly with chronic cardiac conditions, deplete the body's potassium, and thereby potentiate digoxin toxicity (Briant, 1977; Ziance, 1979). Other cardiovascular drugs, such as anti-hypertensive medications and diuretics, account for some of the most frequent medications causing side effects in the elderly (Ziance, 1979). Phenothiazides, anti-Parkinson drugs and antidepressant drugs are some of the more common CNS-acting drugs which create side effects in the elderly population (Ziance, 1979).

"Drug interactions occur when the effects of one drug are modified by the prior or simultaneous administration of another drug" (Cadwallader, 1979, p. 81). Major reasons for the increased occurrence of drug interaction include: (a) an increase in drug potency; (b) multiple drug use by the elderly; (c) medical specialists' unawareness and prescribing of medicines which interact or duplicate the other medicines used by the individual elderly person; and (d) an increase in adverse reaction reporting among this target population (Cadwallader, 1979).

The results of a study by McKenney and Harrison (1976) of 216 general ward admissions during February and March, 1974, revealed that 27% of the 59 drug related hospital admissions were persons 60 years old and older. The number of subjects over 60 years old admitted for drug related reasons was not indicated. Another study (Petersen & Thomas, 1975) conducted in a hospital in Dade County, Florida, reported that drug reaction hospital admission cases 60 years old and older were more likely to be females (68.4%, $n = 41$). The sample consisted of 1,128 drug reaction hospital admissions of all ages. Of the total Dade County population in 1970 (n not indicated by authors), 39% were 50 years old and older, while only 5.4% ($n = 60$) of the total drug reaction admissions were over 50 years old. It was determined that the aged population was not overrepresented among all the admissions to this hospital, when compared with the Dade County population statistics. This study did not show that the elderly were more likely to have drug-related hospital admissions.

Some of the elderly population's characteristics, i.e., visual, comprehension, and other handicaps, lend themselves toward drug misuse. Law and Chalmers (1976) revealed that 128 (85%) out of 151 elderly subjects 75 years old and older were self-administering their medications.

Self-medication can present a multitude of problems in the aged population. Child resistant containers presented difficulty to 60% of 120 community-residing elderly persons studied ("Child-Resistant Containers," 1979). The location of the study was not indicated by the author. In a random sample telephone survey of 636 persons in the Greater Metropolitan Omaha area by McIntire, Angle and Sathees (1977), 33% of the elderly sample (21% of the sample) had problems opening the containers. Of the elderly who had problems with the containers, 9% discontinued using their medication. The number of elderly in the sample, the number of elderly persons having difficulty opening the containers, and the number of elderly who discontinued using their medications were not reported.

Compliance

Compliance to a physician-prescribed medication regimen is an essential component in achieving and maintaining good health status. This belief by health professionals, the high rate of consumer noncompliance, and the lack of consensus of determinant factors influencing compliance create a puzzling concern that warrants further investigation.

Medication Noncompliance Rates

Literature review has shown a wide variation, ranging from 15% to 93%, in reported noncompliance rates (Davis, 1968). Most studies reported that at least one third of participants are noncompliant (Gillum & Barsky, 1974; Hussar, 1975; Marston, 1970). Schwartz, Henley, and Zeitz (1964) reported a 59% noncompliance rate in the 178 subjects studied. Neeley and Patrick (1968), who performed a replication of part of the Schwartz, Wang, Zeitz, and Goss (1962) study, agreed with those results by reporting that 59% of their 59 respondents made errors in medication. Schwartz et al. (1962) found that 105 of the 178 elderly subjects made medication errors. Eshelman (1979) found 73% to 91% noncompliance in studying subjects on hypertensive therapy; however, the scope of this study was not indicated by the author. A study by Kleiger and Dirks (1979) showed that 54% of the 100 chronic asthmatic participants were non-compliant. Fletcher, Pappius, and Harper (1979) found 19% of the 173 participants on digoxin therapy to be noncompliant. It is not hard to find agreement that medication noncompliance is very prevalent in today's world.

Measurement of Compliance

Medication compliance has been measured in several ways. Excretion and serum levels have been considered the most

valid. Second on the list were pill counts. The third and least valid measurement referred to subject self-reporting and interview (Åberg, 1977; Fletcher, Pappius, & Harper, 1979; Marston, 1970). Many studies have used more than one measurement of compliance (Marston, 1970). Hecht (1974) measured medication errors through self-reporting, urine tests, and pill counts. Another study (Fletcher, Pappius, & Harper, 1979) compared serum digoxin levels with interviews and pill counts. The number of errors per week is often the determinant of compliance versus noncompliance.

Classification of Medication Errors

Different researchers have classified medication errors in a variety of ways. Errors of omission were the most common (Hussar, 1975; Kleiger & Dirks, 1979; Neely & Patrick, 1968; Schwartz et al., 1964; Smith, 1979). Smith (1979) and Neely and Patrick (1968) reported the second most common error concerned lack of knowledge or inaccurate knowledge which frequently accompanied an error of omission and resulted in incorrect medication taking. Neely and Patrick (1968) further classified medication errors into the following categories: self-medication, improper timing and sequence, incorrect dosage and timing, incorrect dosage, and potentially serious errors. Other classifications reported by

Hussar (1975) were: wrong purpose, errors of dosage, and errors in time administration. McKercher and Rucker (1977) classified errors into the following seven categories: "errors of omission, errors of commission, errors of scheduling, errors of misconception, errors of procurement, errors of noncompliance, and combined errors" (p. 284). The most frequent errors which occurred in the study of 60 randomly selected subjects were ones of omission and scheduling.

Factors Relating to Noncompliance

Although much research has been conducted in the area of medication compliance and noncompliance, the subject continues to puzzle researchers and health professionals. No consensus has been reached regarding the factors characterizing a model compliant individual. One author (Blackwell, 1973) suggested that every person should be viewed as a potential noncomplier.

According to Hussar (1975) several factors contributing to noncompliance have been identified. They are:

Failure to comprehend the importance of therapy, poor understanding of instructions, multiple drug therapy, adverse effects, fear of becoming drug dependent, patients may be asymptomatic or the symptoms may subside, unpleasant taste of medications, waiting to see the physician or pharmacist, illness, cost of medication, and measurement of medication. (p. 185)

Schwartz et al. (1964) reported that no significant differences were found between error makers and error-free respondents in respect to age, sex, marital status, education, birthplace, employment status, and duration of present illness. However, household composition was found to have some effect on error-making. Neely and Patrick (1968) supported those findings in all except the household composition category. The authors also found that the number of prescribed medications, the method for remembering to take medications, and the respondent's perception of illness significantly correlated with medication error-making. The areas of teaching, physician-patient relationship, complexity of the medication regimen, and perception of health/illness are detailed in the following subsections.

Teaching. In another study by MacDonald, MacDonald and Phoenix (1977), drug compliance was related to three different memory aids along with counseling. Participants were assigned to one of the following three groups by rotation: counseled group, counseled group with three different memory aids, and an uncounseled group. Each participant was rated on the Mental Status Questionnaire (MSQ). The findings of this study failed to show that the memory aids improved compliance at any significant level. The counseled versus the uncounseled group with a MSQ above 12

showed statistical significance at $p < .01$ in relation to the number of medication errors at one week after discharge and again at 12 weeks after discharge. Participants with a MSQ below 12 in the counseled group versus the uncounseled group made less medication errors at one week after discharge and again at 12 weeks after discharge with significance at $p < .05$.

Wandless and Davie (1977) found that memory aids were helpful in reducing the number of errors in their sample of 46 persons. Tear-off calendars were given to one group, which later was found to make the least number of errors. The pages of the tear-off calendar identified the name of the drug, the type of medication (i.e., water tablet), the time the medication should be taken, and the amount of medication to be taken. The second group was given tablet identification cards for their pills, their name, type, time of administration, and number of pills to be taken at each administration. The study had no control group. The second group made more errors than the group given tear-off calendars, but less errors than the group given regular instructions.

Hecht (1974) studied the effects of different amounts of teaching on compliance in 47 adults being treated for tuberculosis. There were four groups in the study, consisting of: one control and three experimental. The control

group received no special teaching. Group II participants were taught at the clinic. Group III participants had additional teaching during home visits. The teaching for groups II and III was done after hospital discharge. The last group received teaching prior to hospital discharge, at the clinic visits, and during home visits. The effect of teaching done in different environments may have influenced the outcome of the study. Medication errors were measured by self-reporting, urine tests, and pill counts. Serious errors were assessed in pill count deviations of more than 15% or by negative urine tests. Out of 17 subjects in the control group, 82% of the participants committed errors and 53% committed serious errors. The number of participants committing errors was not indicated by the author. These errors consistently decreased as the amount of teaching in each group increased.

Contrary to Hecht's findings, McKercher and Rucker (1977) showed that knowledge was not significantly related to compliant behavior. Sixty randomly selected subjects from a midwestern city outpatient clinic participated in this study. In studying 230 Canadian steelworkers, Sackett, Haynes, Gibson, Hackett, Taylor, Roberts, and Johnson (1975) found that an educational program did not increase compliant behavior.

The physician-patient relationship. Different aspects of the physician-patient relationship have been studied with respect to medication compliance. Hulka, Cassel, Kupper and Burdette (1976) studied the relationship in respect to communication of information from the physician to the participant regarding drug taking. Compliance was found to be greater when individuals were given more and better information about their medications. Charney, Bynam, Eldredge, Frank, MacWhinney, McNabb, Scheiner, Sumpter, and Iker (1967) found that a friendly and long relationship between physician and patient positively correlated with compliance.

Davis (1968) studied 154 subjects and found that difficult physician-patient communication was related to noncompliance. No relationship was found between the analysis of the interaction of the first visit to the physician and the degree of compliance.

Even though it is generally accepted that the physician-patient relationship can affect compliance, specific factors of the dynamics of the relationship have not been studied in detail. What has been studied cannot be generalized and further investigation is indicated.

Complexity of the medication regimen. The complexity of the medication regimen, relating to the frequency of doses and the number of medications, generally has had a

negative relationship to medication compliance. This has been supported by studies performed by Hulka et al. (1976), Malahy (1966), and McKercher and Rucker (1977).

Perception of health/illness. Much research has been done regarding individual perception of one's health and illness. A currently popular approach in this area is the Health Belief Model initially developed by Rosenstock (1966; 1974). Becker (1974; 1976) has done extensive work in expanding this model in application to compliant behavior. Variables of the Health Belief Model which affect individual compliance are subjective perception of illness susceptibility and severity, and the efficacy of treatment and amount of personal expenditures (adverse reactions and costs) (Matthews & Hingson, 1977). Nelson, Stason, Neutra, Solomon, and McArdle (1978) used the Health Belief Model approach in studying the compliance of 142 hypertensive individuals under treatment. This study measured compliance by blood pressure control, self-reporting, and appointment keeping. A positive correlation was found between self-reported medication taking and control of blood pressure ($p=.02$). Self-reported medication taking was found to be positively correlated with perceived severity of hypertension. Blood pressure control was positively related to the perceived efficacy of the treatment.

In summary, the amount of literature on the subject of medication compliance is tremendous. Unfortunately, very little is considered common knowledge about the influencing factors in medication compliance. Research has not yet indicated the determinant factors which contribute to compliant behavior. Further investigation is necessary since medication compliance is considered to be a vital component to the treatment of illness and the maintenance of health.

Nursing Role in Consumer Education

As mentioned before, health professionals are showing increasing concern about the high rate of noncompliance. Physicians, pharmacists, nurses, researchers, and educators have shown independent and collaborative efforts in studying medication compliance. Studies by Fletcher, Pappius, and Harper (1979), Fletcher, Fletcher, Thomas, and Hamann (1979), and MacDonald et al. (1977) reflected a minute number of research studies performed collaboratively among different disciplines of the health professions. Pharmacists (Hussar, 1975; Weber & Sather, 1976) have indicated their interests by studying some functional roles of pharmacists in the area of noncompliance.

Nursing views consumer education as one of the roles which aid individuals to achieve and maintain a healthy status. A study of 1500 nurses (Pohl, 1965) reported that

the majority of nurses considered teaching an important responsibility of the professional nurse.

Many nurse researchers (Daniels & Kochar, 1979; Leary, Vessela & Yeaw, 1971; Linde & Janz, 1979; Neely & Patrick, 1968) have addressed different aspects of medication compliance in their research. A study by Spector, McGrath, Uretsky, Newman, and Cohen (1978) reported the results of randomly selected subjects from a medical clinic population to check if the compliance levels were different in a group taught by a nurse. Compliance was measured by levels of drugs in the blood. The results indicated persons taught by the nurse were not any more compliant than the nonintervention control group, but were more compliant than the general clinic population.

Sechrist (1979) reported on a study performed by BSN students during their clinical experience in medical-surgical nursing. Forty-one subjects were included in the study and assigned to the repetitive teaching group or the single teaching group. The subjects' scores on a knowledge instrument were measured, and the difference between means was found to be significant at $p < .01$.

Hecht (1974) studied the effects of different amounts of teaching on the medication errors of patients receiving tuberculosis therapy. This study of 47 subjects showed

that teaching by nurses had some effect in decreasing the percentage of error generally and the percentage of serious error. The group of participants receiving the most teaching committed the least number of errors.

These studies and many others have been performed by nurses with the intent to further nursing knowledge in the attempt at improving the complex mechanism of medication compliance. As mentioned before, further investigation is appropriate and necessary to establish some consistency in understanding the factors which influence medication compliance.

Summary

This chapter presented the review of literature regarding aging, medication compliance, and consumer education as a nursing role. Much research continues in the area of aging. Generally, some consensus has been achieved regarding the aging process, although new research has generated new knowledge. Medication compliance studies show no general agreement regarding determinant factors, but it is agreed that noncompliance is a widespread problem. Nurses, as well as other health professionals, have indicated an interest in educating the consumer about health.

CHAPTER 3

PROCEDURE FOR COLLECTION AND TREATMENT OF DATA

This study represented a four-group before-after design with two control groups, an experimental research design according to criteria described by Campbell and Stanley (1966). It is part of a cluster study in which three researchers collected separate data for individual and separate theses. In this cluster study, the content of the research design, the instruments, and the oral informed consent were identical for the purpose of developing a comparable data base; this expanded study was geographically impractical for one researcher to perform. The larger sample makes more data available and hopefully leads to more valuable research.

This study was aimed at applied evaluative research of the Elder-Ed program sponsored by the Houston-Galveston Area Council (H-GAC). This research concerns a portion of a broader program for administration and evaluation of the Elder-Ed program, sponsored by the National Institute on Drug Abuse (1979) and funded through the U.S. Department of Health, Education, and Welfare (DHEW). H-GAC, after deciding to institute this program for the senior citizens attending

the nutrition sites within the H-GAC region, purchased the educational materials from DHEW for each senior citizen.

Setting

The study took place within the 13-county area under H-GAC's jurisdiction, excluding Harris County. There were a total of 21 nutrition sites administered by the Area Agency on Aging (AAA) division of H-GAC. Of the 16 sites designated as urban sites, two were predominantly Spanish speaking and were not included in the study, and five sites were designated as rural sites. A list of all the nutrition sites can be found in Appendix B. Three of the smallest urban sites were reserved for the pilot study conducted prior to this study. Eleven urban sites and five rural sites comprised the two different strata for the study.

The data gathering and treatment presentation took place in the main room of the nutrition sites where the film was shown. The nutrition sites serve hot, well-balanced lunches five days a week at conveniently located areas, such as churches, community centers, senior centers, and other public or private facilities. The meals are planned to meet the daily recommended dietary allowances established by the Food and Nutrition Board of the National Academy of Science-National Research Council (Sourcebook on Aging, 1977).

Population and Sample

People attending the nutrition sites comprised the population of this study. H-GAC's and AAA's guidelines for attendance were only limited to the clients' age of 60 years or older. The attendance at the five rural sites ranged between 30 and 65 people per site. The attendance at the 13 urban sites ranged between 30 and 80 persons per site. Data were collected from the total number of persons wishing to participate at a randomly selected site. For sampling, urban and rural strata were formed. From the urban strata, three of the smallest nutrition sites were included in the pilot study performed by another researcher. From each of these strata, randomization by the lottery method then was employed to choose the two urban sites and the two rural sites. Further randomization was used to choose the control and experimental groups for each strata. The third researcher had four additional separate sites for data collection.

The criteria for selection of individuals to comprise the sample studied were:

1. Attendance at nutrition sites
2. Responsibility of self-medication
3. The taking of prescription drugs
4. Age 60 years or older

5. Ability to speak English
6. Orientation to person, place and time
7. Voluntary participation

The instrument and treatment were administered to all volunteer participants, but only those individuals meeting the eligibility criteria were included in the final data analysis.

Protection of Human Subjects

The study was approved by the Human Research Review Committee at Texas Woman's University (Appendix C). H-GAC approval then was obtained (Appendix D). The questionnaires and pill counts were coded for analytical purposes. A list of codes linking the pretest, posttest, demographic data, and pill counts to specific subjects was used and then destroyed after the study. The rationale for these links was to ensure matching of all instruments should a subject forget his/her code number. The use of this coding decreased the attrition of the study subjects. To maintain anonymity, each subject signed a release form and returned it to the researcher before data collection began. To protect individual rights, only volunteer participants were included in the study.

Instruments

The Demographic Data Profile (Appendix E) was developed by the investigator. The instrument was modified from the instrument used by the Heart of Texas Council of Government (HOTCOG), which is the counterpart of H-GAC in Bosque, Falls, Freestone, Hill, Limestone, and McLennan Counties. Written permission was obtained for the use of this instrument prior to data collection (Appendix F).

The Demographic Data Profile included 14 questions regarding age, race, sex, marital status, religion, level of completed education, employment status, monthly income, household composition, types and number of illnesses within the past five years, the responsibility for self-medication, and the number of drugstores used regularly for the purchase of prescription drugs. Some of the data collected aided in eligibility identification. Other data were used to determine associations between the demographic variables and knowledge and compliance.

Pill counts were one of the measurements of medication compliance. The Pill Count Record (Appendix G) was devised on a ratio scale of measurement, whereby compliance was calculated into percentages.

Self-reporting, the second measure of compliance (Self-Reporting Profile, Appendix H) originally was compiled

by the researcher utilizing, modifying, and adding to the instrument developed by HOTCOG. The Self-Reporting Profile, scaled ordinally, followed a Likert-type format. The instrument was developed with the questions coded such that a high score for this section indicated a relatively higher degree of compliance than a lower score.

Content validity for the Self-Reporting Profile was obtained through a group of expert judges. An agreement of two out of three judges indicated a criterion for acceptance of this instrument. The panel consisted of a clinical pharmacist, an H-GAC employee familiar with the Elder-Ed program, and a member of the Texas Woman's University baccalaureate faculty who was a member of the H-GAC Advisory Committee. The judges were given the packet of the printed materials and an opportunity to view the film. Based on the results of the pilot study, the instrument was revised in an attempt to reach an acceptable level of reliability. For this purpose, several questions were eliminated and several other questions were reworded. Due to the participants' difficulties in understanding the quantified five level response categories (Always, Often, Sometimes, Seldom, and Never), the Self-Reporting Profile response categories were simplified to three categories (Yes, Sometimes, No). Reliability of this questionnaire obtained

through performing a statistical procedure, the coefficient alpha, was 0.910 for this sample.

The Knowledge Profile (Appendix I) was compiled by the researcher based on the content of the film and information packet. Again, the HOTCOG questionnaire was used in the development of the knowledge instrument. Knowledge was measured on an intervally scaled basis with questions dichotomous in nature, requiring a "yes" or "no" answer; however one question required the choosing of a correct response from multiple options. Each correct response to a knowledge question received one point, while each incorrect response received zero points. The higher score indicated greater knowledge.

Content validity was obtained through the same panel of judges. An agreement of two of the three judges indicated the criterion for acceptance of this instrument. Based on the results of the pilot study, this instrument was revised for the purpose of attempting to reach an acceptable level of reliability. Several questions were eliminated and several others were reworded for this reason. Reliability of the Knowledge Profile was obtained through the Kuder-Richardson 20 formula. The calculated reliability for this sample was 0.409.

Data Collection

This study had one principal investigator and additional data collectors. The initial contact to plan the study occurred at a meeting or through telephone conversations with the managers or designated leaders of the nutrition sites. A brief overview of the program was presented to these individuals. Cooperation from the managers was an integral part of the study.

One week before the initiation of the study, posters were distributed to the site managers. The investigator visited the designated sites the day of the poster distribution. During this visit, the investigator, using a list of persons attending the specific nutrition sites, personalized brown paper bags with each person's name. The managers were asked to distribute them one day before subjects were to bring their oral medications. The prospective participants in the study were asked by the managers to bring all their oral medications in the bags to the nutrition sites on the designated days. Also, on this first visit to the specific nutrition sites, the investigator met or obtained telephone numbers of the van drivers who transported the elderly to and from the nutrition sites. The van drivers' cooperation was sought to remind the elderly about their medication bags on the mornings of the study.

Two days prior to the study, the investigator contacted the managers to remind them to distribute the medication bags. One day before the study, the investigator, or the manager, contacted the individual van drivers to remind them of their role in having the prospective participants comply with the request to bring their medication bags.

On the first day of data collection, the investigator explained the study verbally (Appendix J). The options to participate, or not, or to withdraw at any time were presented. The investigator obtained written consents from each participant, and then proceeded with the demographic data collection. The Demographic Data Profile was read, one question at a time, to small groups of two to three participants by a data collector. Some participants responded without having questions read to them. A Spanish speaking translator was available but those needing this service were not included in the final sample since they did not meet the study criteria. A pencil code was marked on the upper right corner of these participants' response sheets to allow their exclusion from the analysis. Pill counts also were performed on all of the volunteer participants to obtain baseline information. Each participant was given a code number, pasted to his/her wallet, used to match the demographic data sheet, questionnaires, and pill

counts. A separate list matched the participants' names with their assigned codes. This list, used only if a participant lost his/her code, was destroyed at the end of data collection.

Five days following initial data collection, site managers were called by the investigator to remind them to encourage participants to bring their oral medications for the second data collection. The next day, the van drivers were called by the manager or investigator for assistance with reminders to the participants about bringing their medications. The following day, exactly one week after the initial collection of data, the participants were given two pretest written questionnaires (the Self-Reporting Profile and the Knowledge Profile). The questionnaires required the use of the participants' code numbers. Assistance was provided by the investigator if the participants did not have their codes. The questions were read aloud by the data collectors to groups of two to three people. Again, pill counts were performed to measure the participants' medication compliance. After the pretesting was completed, the experimental group received the treatment--the presentation of the film and the distribution of the information packets.

Five days after the second data collection, the managers were called to remind them to urge the participants

to bring their medications for the third time. The following day, one day before the third day of data collection, the van drivers were asked to assist with the last set of reminders to the participants about their medication bags. At one site, the investigator had to return the following week for the third day of data collection because one of the vans was broken and not able to bring the participants to the site. The next day, seven days after the treatment, the investigator and data collectors revisited the nutrition sites to administer the posttests, consisting of a repeat of the pretests (the Self-Reporting Profile and the Knowledge Profile), and to perform the third pill count. This time also the participants were divided into groups of two to three persons. The instruments were administered in the same way as for the pretest.

The procedure for data collection for the control groups generally was the same, except as indicated below. The treatment was given after the posttest on the third day of data collection.

Treatment of Data

A descriptive analysis of the sample was performed. Race, sex, marital status, religion, employment status, household composition, and the number of pharmacies used regularly were scaled nominally. The data distribution of

these variables was reported in percentages. The range, mean, and standard deviation were tabulated to describe the variables of age, level of completed education, socioeconomic status (SES), number of illnesses, and the number of prescribed medications. The level of knowledge and pill counts (a measurement of compliance) were described using the range, mean, and standard deviation. The median and the range described the self-reporting measurement of compliance.

Inferential statistics were performed to test the significance for the sample at $p \leq .05$. The Kruskal-Wallis test and the Mann-Whitney U test were used to determine if a significant difference existed between the independent variables, race, sex, marital status, religion, employment status, level of income, household composition, number of illnesses, the number of pharmacies used regularly, and the dependent variable, the self-reporting aspect of compliance. The above independent variables were analyzed for significant differences, at the $p \leq .05$, with the pill counting aspect of compliance, and again with knowledge, using a One-Way ANOVA.

The Two-Way ANOVA tested the difference for the mean gain scores of the Knowledge Profile from the pretest and posttest among all the study sites. The mean ranks of the

self-reporting scores were tested at $p < .05$ by the Kruskal-Wallis test for any significant difference among groups. The difference between the mean gain scores of the pill counts were analyzed for significance using the Two-Way ANOVA.

Spearman's Rho correlation coefficient was used to determine the correlation between the following variables.

1. Age and compliance as measured by self-reporting
2. Level of education and compliance as measured by self-reporting
3. Number of illnesses and self-reporting
4. Number of prescription medications and self-reporting

The Pearson r correlation coefficient showed the association between the following:

1. Age and pill count measurement of compliance
2. Age and knowledge
3. Level of education and pill counts
4. Level of education and knowledge
5. Number of illnesses and pill counts
6. Number of illnesses and knowledge
7. Number of prescription medications and the pill counting aspect of compliance
8. Number of prescription medications and knowledge

The correlation between knowledge and ordinally scaled compliance (self-reporting) was determined by the Spearman's Rho coefficient of correlation. The Pearson r correlation coefficient was used to show the degree of association between knowledge and compliance as measured by pill counts. The correlation between the two different measures of compliance, self-reporting and pill counts, was tabulated by the Spearman's Rho correlation coefficient. All calculated correlation coefficients were converted to a t in order to determine the statistical significance at $p < .05$.

CHAPTER 4

ANALYSIS OF DATA

This experimental research study was concerned with evaluation of the effect of knowledge of a structured education program, the Elder-Ed program. The relationship between knowledge and medication compliance also was explored. This chapter presents the description of the sample according to demographic variables, compliance-related variables as documented by the literature, and description of instruments' scores. The hypotheses and corresponding null hypotheses order the presentation of the findings and analysis. Both BMDP (1977) and SPSS (Nie, Hull, Jenkins, Steinbrenner, & Bent, 1975) computer programs were used in the analysis of data.

Description of Sample

The stratified four group sample consisted of a final total of 22 subjects. On the first day of data collection, 66 persons were found to meet the eligibility criteria for participation in the study. Forty-one of the 66 eligible participants came for the second day of data collection, creating a 37.9% attrition rate. On the third day of data collection, 22 of the eligible participants were present.

The attrition rate from the first to the third day of data collection was 66.7%; the attrition rate from the second to the third day of data collection was 46.3%. Several factors contributed to the attrition rate:

1. The breakdown of a nutrition site van
2. Participants' attendance at a funeral service of a friend
3. Participants' lack of understanding regarding the bringing of medications for all three days of data collection

The breakdown of the number of participants who finished all three days of data collection for each group was as follows:

1. Six from the urban control (UC) group
2. Five from the urban experimental (UE) group
3. Six from the rural control (RC) group
4. Five from the rural experimental (RE) group

Demographic Variables

The age distribution of the sample ranged from 60 to 92 years of age, with the mean age of 73.68 and standard deviation of 8.44. The greatest number of participants, six, were in the 70-74 year age group. Eight subjects below 70 years of age constituted 36.4% of the total sample. Table 1 displays age distribution of the sample by group.

Table 1

Age Distribution by Group

Age by Year	Number of Subjects				Total	
	UC	UE	RC	RE	n	%
60-64	0	0	1	2	3	13.6
65-69	1	2	2	0	5	22.7
70-74	3	1	1	1	6	27.4
75-79	0	1	1	0	2	9.1
80-84	2	0	1	0	3	13.6
85-89	0	1	0	1	2	9.1
90-94	0	0	0	1	1	4.5
Totals	6	5	6	5	22	100.0

The subjects' racial/ethnic origin was distributed in three categories with 16 (72.8%) of the participants being black. The three (13.6%) Mexican American participants were in the RE group. Table 2 represents the racial/ethnic origin distribution by group.

Nineteen females constituted the majority (86.4%) of the sample. The three (13.6%) male participants belonged to only two groups; neither the RC nor the RE groups had male participants. The distribution by sex is shown in Table 3.

Table 2

Racial/Ethnic Origin Distribution by Group

Race	Number of Subjects				Total	
	UC	UE	RC	RE	n	%
Black	4	5	5	2	16	72.8
Mexican-American	0	0	0	3	3	13.6
White	2	0	1	0	3	13.6
Totals	6	5	6	5	22	100.0

Table 3

Sex Distribution by Group

Sex	Number of Subjects				Total	
	UC	UE	RC	RE	n	%
Male	2	1	0	0	3	13.6
Female	4	4	6	5	19	86.4
Totals	6	5	6	5	22	100.0

The distribution of the subjects' marital status included 6 (27.3%) married participants, 14 (63.6%) widowed participants, and 2 (9.1%) divorced participants. Widowed persons comprised the total number of participants in the UC group. In three out of four groups, widowed persons outnumbered married and divorced persons.

The sample consisted of 4 (18.2%) Catholics, 14 (63.6%) Protestants, and 4 (18.2%) participants of other religions. Protestants outnumbered the participants of other religions in all but the RE group.

The educational level of the participants ranged from 0-12 years of attendance at school, with the mean number of years 6.55 and a standard deviation of 0.51. Table 4 shows educational level distribution as indicated by the years of attendance at school.

Table 4

Distribution of Years of Attendance at School by Group

Years of School Attendance	Number of Subjects				Total	
	UC	UE	RC	RE	n	%
0-6	2	3	2	3	10	45.5
7-12	4	2	4	2	12	54.5
Totals	6	5	6	5	22	100.0

Three categories represented the current employment status of the sample. A great majority ($n = 20$, 91.0%) of the participants were retired. The employment status distribution by group is indicated in Table 5.

Table 5
Employment Status Distribution by Group

Employment Status	Number of Subjects				Total	
	UC	UE	RC	RE	n	%
Full-time	0	0	0	1	1	4.5
Part-time	0	1	0	0	1	4.5
Retired	6	4	6	4	20	91.0
Totals	6	5	6	5	22	100.0

The socioeconomic status (SES) of the participants was represented by their monthly individual income. The participants' income ranged from \$100 to \$999 per month, with a mean income of \$269.95 and standard deviation of 0.21. Of the subjects included in the study, 21 (95.5%) had an income in the \$100 to \$399 category, and 1 (4.5%) had an income in the \$400 to \$999 category. The one participant in the latter category belonged to the RE group.

The categories indicating the household composition of the participants are exclusive. The greatest number

of subjects, 12 (54.6%) lived alone. Table 6 details the household composition by group.

Table 6
Household Composition Distribution by Group

Household Composition	Number of Subjects				Total	
	UC	UE	RC	RE	n	%
Self only	4	4	1	3	12	54.6
Self and spouse only	1	1	2	1	5	22.7
Self and child only	1	0	2	1	4	18.2
Self and at least one other relative	0	0	1	0	1	4.5
Totals	6	5	6	5	22	100.0

Compliance Related Variables

This section describes the variables which are considered compliance related. The participants self-reported on the types of illnesses they experienced in the past five years. The number of illnesses totalled 90 for the 22 subjects. Within the range of 0 to 10, one participant reported having no illnesses during the past five years, while one participant reported having 10 illnesses during the past five years. The mode was 3, whereby five

participants reported having three illnesses. The mean number of illnesses was 4 with a standard deviation of 0.82. The number of illnesses is distributed by group in Table 7.

Table 7
Distribution of Number of Illnesses

Number of Illnesses	Number of Subjects				Total	
	UC	UE	RC	RE	n	%
0-2	1	0	4	2	7	31.8
3-5	4	2	0	2	8	36.4
6 or more	1	3	2	1	7	31.8
Totals	6	5	6	5	22	100.0

The number of medications regularly prescribed to the participants ranged from one to four or more. The mean was 2.18 and standard deviation 1.18. The greatest number of participants, 9 (40.9%), took only one prescribed medication. Table 8 displays the distribution by group.

More than one pharmacy was used regularly by 5 (22.7%) of the participants for the filling of their prescriptions, while 17 (77.3%) participants used one pharmacy. All the participants in the UE and RE groups visited only one pharmacy regularly.

Table 8

Distribution of Number of Prescribed Medications by Group

Number of Prescribed Medications	Number of Subjects				Total	
	UC	UE	RC	RE	n	%
1	3	2	1	3	9	40.9
2	0	0	3	1	4	18.2
3	2	1	1	1	5	22.7
4 or more	1	2	1	0	4	18.2
Totals	6	5	6	5	22	100.0

Description of Instruments' Scores

Data were collected and analyzed by three different instruments. The Knowledge Profile (KP) measured the participants' knowledge. The Self-Reporting Profile (SRP) and the Pill Count Record (PCR) measured, respectively, the self-reporting and pill counting aspects of compliance. All the instruments were administered on a pretest, post-test basis.

The range of possible scores on the intervally scaled KP was 0 to 10, with 0 being the lowest score. The scores on the KP pretest ranged from 4 to 9; the mean score on the KP pretest was 7.73, standard deviation 1.35. The KP posttest scores ranged from 4 to 10; the mean score for

the sample was 7.96 with a standard deviation of 1.43. The comparison of the distribution of the KP pretest and KP posttest scores is shown in Table 9.

Table 9

Distribution of Scores on the KP Pretest and the KP Posttest

Scores	<u>KP Pretest</u>		<u>KP Posttest</u>	
	n	%	n	%
4	1	4.5	1	4.5
5	1	4.5	0	0.0
6	0	0.0	1	4.5
7	7	31.9	6	27.3
8	5	22.7	6	27.3
9	8	36.4	5	22.7
10	0	0.0	3	13.7
Totals	22	100.0	22	100.0

The range of KP pretest scores for the UC, UE, RC, and RE groups was 7-9, 4-9, 7-9, and 5-8, respectively. The scores on the KP posttest ranged from 7-9 for the UC group, 4-10 for the UE group, 6-10 for the RC group, and 7-8 for the RE group. The range, mean and standard deviation of the KP pretest and the KP posttest scores for each group are displayed for contrast in Table 10.

Table 10

Comparisons of the Range, Mean and Standard Deviations
Between the KP Pretest and KP Posttest by Group

Instrument	UC	UE	RC	RE	Total
<u>KP Pretest</u>					
Range	2.00	5.00	2.00	3.00	5.00
Mean	8.50	7.00	8.17	7.00	7.73
Standard Deviation	0.84	1.87	0.98	1.22	1.35
<u>KP Posttest</u>					
Range	2.00	6.00	4.00	1.00	6.00
Mean	8.17	7.60	8.67	7.95	7.96
Standard Deviation	0.75	2.30	1.51	0.45	1.43

The range of possible scores on the ordinally scaled Likert-type SRP was 8 to 24, with the lower score indicating a lesser degree of compliance. The scores on the SRP pretest ranged from 20 to 24. The median score for the sample was 22.83 and the range was 4. The scores for the SRP posttest ranged from 17 to 24; 21.83 and 7 reflect the median and range, respectively, for the SRP posttest scores. The SRP pretest and posttest scores are contrasted in Table 11.

Table 11

Distribution of Scores on the SRP Pretest and the SRP Posttest

Scores	<u>SRP Pretest</u>		<u>SRP Posttest</u>	
	n	%	n	%
17	0	0.0	1	4.5
19	0	0.0	6	27.3
20	3	13.6	3	13.6
21	2	9.1	0	0.0
22	5	22.8	3	13.6
23	3	13.6	2	9.1
24	9	40.9	7	31.9
Totals	22	100.0	22	100.0

The SRP pretest scores for the UC, UE, RC, and RE groups ranged from 21-24, 20-24, 20-24, and 22-24, respectively. The scores for the posttest ranged from 19-24 for the UC group, from 19-24 for the UE group, from 17-24 for the RC group, and from 19-24 for the RE group. The range and median scores of the SRP pretest and posttest are presented in Table 12.

The second instrument used for measuring compliance was the PCR. Participants' compliance was calculated by percentages; 0% indicating no compliance and 100%

Table 12

Comparison of the Range and Median Scores Between
SRP Pretest and SRP Posttest by Group

Instrument	UC	UE	RC	RE	Total
<u>SRP Pretest</u>					
Range	3	4	4	2	4.00
Median	23	23	23	23	22.83
<u>SRP Posttest</u>					
Range	5	5	7.0	5	7.00
Median	24	23	19.5	22	21.83

indicating complete compliance with physician instructions. The PCR pretest scores for this sample ranged from 0 to 100%. The mean score was 66.18 and standard deviation 30.71. The scores on the PCR posttest also ranged from 0 to 100%, with a mean of 69.68 and standard deviation of 30.96. One participant never refilled the prescription and was considered 0% compliant, while four participants were 100% compliant. The distribution of PCR pretest and posttest scores is presented in Table 13.

The PCR pretest scores ranged from 55 to 100% for the UC group, from 0 to 93% for the UE group, from 14 to 100% for the RC group, and from 35 to 100% for the RE group.

Table 13

Distribution of Scores on the PCR Pretest and the PCR Posttest

Scores	<u>PCR Pretest</u>		<u>PCR Posttest</u>	
	n	%	n	%
0-20%	3	13.7	2	9.1
21-40%	1	4.5	2	9.1
41-60%	5	22.7	2	9.1
61-80%	4	18.2	6	27.2
81-100%	9	40.9	10	45.5
Totals	22	100.0	22	100.0

The posttest scores of the PCR were as follows: 68 to 100% for the UC group, 0 to 92% for the UE group, 0 to 100% for the RC group, and 21 to 100% for the RE group. Each group's range, mean, and standard deviation are reported in Table 14.

Findings

The findings and analyses are ordered according to the null hypotheses and their corresponding alternates.

H_{01} : There is no difference in knowledge about taking drugs wisely among a select group of elderly persons before and after the treatment, the administration of the Elder-Ed program.

Table 14

Comparison of the Range, Mean, and Standard Deviation from the PCR Pretest and PCR Posttest Scores by Group

Instrument	UC	UE	RC	RE	Total
<u>PCR Pretest</u>					
Range	45.00	93.00	86.00	65.00	100.00
Mean	83.50	62.00	53.83	64.40	66.18
Standard Deviation	15.81	38.27	38.17	25.47	30.71
<u>PCR Posttest</u>					
Range	32.00	92.00	100.00	79.00	100.00
Mean	84.00	66.80	56.50	71.20	69.68
Standard Deviation	12.41	38.13	36.87	33.27	30.96

H_{11} : A structured education program will improve knowledge about taking drugs wisely among a select group of elderly persons who self-administer their drugs.

To test H_{01} a Two Way ANOVA was calculated. Table 15 presents the ANOVA calculations for comparison of the KP pretest and the KP posttest in all the groups. The null hypothesis was retained since $p > .05$.

Table 15

ANOVA Summary Table of KP Pretest and KP Posttest
in All Groups

Source	Sum of Squares	Degrees of Freedom	Mean Square	<u>F</u>	<u>p</u>
Between Group	15.30	3	5.10	1.91	.16
Between Group Error	48.08	18	2.67		
Across Trials	1.52	3	0.51	0.55	.65
Across Trials Error	16.42	18	0.91		

H_{02} : There is no correlation between knowledge about aspects of correct drug taking behavior and the self-reporting aspect of compliance in a select group of elderly persons who self-administer their drugs.

H_{12} : Knowledge about aspects of correct drug taking behavior is positively related to drug compliance as measured by self-reporting, in a select group of elderly persons who self-administer their drugs.

The Spearman rho correlation coefficient was calculated to determine if a correlation existed between KP posttest and the SRP posttest. The correlation obtained was $\underline{r} = -0.091$, $\underline{p} = .34$. Only 0.82% (\underline{r}^2) of the variance can

be considered explained variance. It is concluded that no correlation exists between knowledge and self-reporting.

H₀₃: There is no correlation between knowledge about aspects of correct drug taking behavior and the pill counting aspect of compliance in a select group of elderly persons who self-administer their drugs.

H₁₃: Knowledge about aspects of correct drug taking behavior is positively related to drug compliance as measured by pill counting, in a select group of elderly persons who self-administer their drugs.

The Pearson r correlation coefficient tested H₀₃ with the results, $r = -0.093$, $p = .34$, $r^2 = 0.86\%$. No correlation was identified between knowledge and the pill counting aspect of compliance.

Additional null hypotheses and their corresponding alternate hypotheses were formulated as extensions of Hypotheses 1, 2, and 3. They are presented as follows:

H₀₄: There is no difference in compliance as measured by self-reporting of a select group of elderly persons before and after the treatment, the administration of the Elder-Ed program.

H₁₄: A structured education program will improve the compliance, as measured by self-reporting, of a

select group of elderly persons who self-administer their medications.

To test H_{04} the Kruskal-Wallis test was used to compare the mean ranks for each group. The results were not significant ($\chi^2 = 3.30$, $p = .34$), therefore the null hypothesis was retained.

H_{05} : There is no difference in compliance as measured by pill counting before and after the treatment, the administration of the Elder-Ed program, in a select group of elderly persons who self-administer their drugs.

H_{15} : A structured education program will improve the compliance, as measured by pill counting, of a select group of elderly persons who self-administer their drugs.

A Two-Way ANOVA was used to test H_{05} . The null hypothesis was retained since no significant difference was ascertained between groups in respect to the PCR pre-test and the PCR posttest ($p = .97$). Table 16 presents the ANOVA calculations.

H_{06} : There is no correlation between the self-reporting and the pill-counting aspects of compliance in this select group of elderly persons.

Table 16

ANOVA Summary Table for PCR Pretest and PCR Posttest
in All Groups

Source	Sum of Squares	Degrees of Freedom	Mean Square	F	p
Between Group	5082.88	3	1694.29	1.02	.41
Between Group Error	29931.42	18	1662.86		
Across Trials	60.52	3	20.18	0.07	.97
Across Trials Error	4865.22	18	270.29		

H_{16} : A positive relationship exists between the two measurements of compliance, self-reporting and pill counts, in this select group of elderly persons.

The Spearman rho correlation coefficient calculated to test H_{06} indicated the relationship between self-reporting and pill counting. The results were $r = 0.538$, $p = .005$. Thus in this study 28.94% (r^2) explained variance exists between the two measurements of compliance. The null hypothesis was rejected in favor of the alternate hypothesis which indicated that a positive correlation exists between self-reporting and pill counting.

H₀₇: There is no relationship between certain demographic/compliance related factors (race, sex, marital status, religion, employment status, socioeconomic status, household composition, and number of pharmacies used) and knowledge in this select group of elderly persons.

H₁₇: Certain demographic/compliance related factors are related to knowledge in this select group of subjects who self-administer their medication.

A One-Way ANOVA was used to determine the existence of a relationship between each demographic/compliance related factor and knowledge. The statistical significance level for each relationship was not .05 or lower, therefore H₀₇ for each relationship was retained.

H₀₈: There is no correlation between certain demographic/compliance related factors (age, level of education, number of illnesses, and number of regularly prescribed medications) and knowledge in this select group of elderly persons.

H₁₈: Certain demographic/compliance related factors are related to knowledge in this select group of subjects who self-administer their medication.

To determine this correlation the Pearson r correlation coefficient was calculated. The level of

education was correlated with knowledge at $\underline{r} = 0.428$, $\underline{p} = .02$. The correlation between level of education and knowledge offers an 18.3% (\underline{r}^2) explained variance. The null hypothesis was rejected while the alternate hypothesis indicating a positive correlation between the level of education and knowledge was accepted. The calculated correlation coefficients for the other variables ranged from $\underline{r} = -0.254$ to 0.082 , $\underline{p} = .13$ to $.44$. The null hypotheses for each remaining association were retained.

H_{09} : There is no relationship between certain demographic/compliance related factors (race, sex, marital status, religion, employment status, socioeconomic status, household composition, and the number of pharmacies used) and the self-reporting aspect of compliance in this select group of elderly persons.

H_{19} : Certain demographic/compliance related factors are related to compliance, as measured by self-reporting, in this select group of elderly persons who self-administer their drugs.

The relationship for each factor was investigated using the Kruskal-Wallis or Mann-Whitney U. No significant relationship was identified; the null was retained.

H_{010} : There is no correlation between certain demographic/compliance related factors (age, level of education, number of illnesses, and number of regularly prescribed medications) and the self-reporting aspect of compliance in this select group of elderly persons.

H_{110} : Certain demographic/compliance related factors are related to compliance, as measured by self-reporting, in this select group of elderly persons who self-administer their drugs.

The Spearman rho correlation coefficients, calculated for each factor, ranged from $r = -0.193$ to 0.181 . Again, the null hypothesis was retained.

H_{011} : There is no relationship between certain demographic/compliance related factors (race, sex, marital status, religion, employment status, socioeconomic status, household composition, and number of pharmacies used) and the pill counting aspect of compliance in this select group of elderly persons.

H_{111} : Certain demographic/compliance related factors are related to compliance, as measured by pill counts, in this select group of elderly persons who self-administer their drugs.

The examination of the relationship between each factor and pill counts, using the One-Way ANOVA, showed no significant results (p ranged from .06 to .86). The null hypothesis was retained.

H_{012} : There is no correlation between certain demographic/compliance related factors (age, level of education, number of illnesses, and number of regularly prescribed medications) and the pill counting aspect of compliance in a select group of elderly persons.

H_{112} : Certain demographic/compliance related factors are related to compliance, as measured by pill counts, in this select group of elderly persons who self-administer their drugs.

The Pearson r correlation coefficient determined the correlation between each factor and pill counts. The calculated correlation coefficients ranged from -0.260 to 0.103. Again, the null hypothesis was retained.

Summary

This study was concerned with the evaluation of the Elder-Ed program and its relationship to knowledge and compliance. Other areas of study involved investigating the relationships between: Knowledge and compliance, the two measurements of compliance, certain demographic/

compliance related factors and knowledge, and certain demographic/compliance related factors and compliance. The statistical analysis of the data failed to show any significant relationships in 10 out of 12 null hypotheses studied. A highly significant positive correlation ($r = 0.538$, $p = .005$, $r^2 = 28.94\%$) was found between the two aspects of compliance--self-reporting and pill counts. The correlation ($r = 0.428$) between level of education and knowledge also was found to be significant ($p = .02$).

CHAPTER 5

SUMMARY OF THE STUDY

This chapter presents a study summary, findings, conclusions, and implications. Recommendations for future research complete this section. This experimental study consisted of a four-group before and after research design with two control groups (Campbell & Stanley, 1966). This study, an evaluation of the Elder-Ed program, a nationally sponsored education program regarding wise medication use for senior citizens, examined this structured education program in relationship to knowledge obtained from the program. The second area of study concerned the relationship between knowledge and compliance. The association between the Elder-Ed program and compliance was also investigated. The self-report and the pill count aspects of compliance were directed toward the identification of any significant relationships between them. This study investigated the relationship of certain demographic/compliance related factors with knowledge, and again with compliance.

Summary

An increasing concern among health professionals about medication noncompliance is evident due to the magnitude

and persistence of the problem. A review of the literature indicated that consistent determinant factors for the compliance/noncompliance issue have not been identified (Gillum & Barsky, 1974; Matthews & Hingson, 1977). The pursuit of this study evolved due to the interest in furthering the knowledge concerning determinant factors in compliant behavior.

This study was part of a cluster study in which three researchers collected separate data for individual theses. For the purpose of developing a comparable data base, the content of the research design, the instruments, and the oral informed consent were identical in this cluster study. One researcher performed the pilot study, while two other researchers, using different samples, used comparable methodology.

Urban and rural groups comprised the strata. Randomization was used to choose the study sites and to determine experimental and control groups. The study consisted of four groups: urban control, urban experimental, rural control, and rural experimental. Twenty-two participants met the eligibility criteria and attended the sites on all three days of data collection.

Four instruments, the Demographic Data Profile (DDP), the Knowledge Profile (KP), the Self-Reporting Profile (SRP),

and the Pill Count Record (PCR), were developed and used by all three researchers. The data collection took place over three days, each approximately one week apart, to provide the researchers with baseline, pretest, and posttest information. The DDP aided the researcher in determining the eligibility of the prospective participants, and in describing certain demographic/compliance related characteristics. The KP, an intervally scaled instrument, was used in gathering data regarding the participants' knowledge about wise drug use. The SRP, an ordinally scaled instrument fashioned in a Likert-type format, measured the participants' perception of their own compliant behavior. The second measurement of compliance, the PCR, reflected participants' scores from the pill counts performed on three separate days of data collection.

Discussion of Findings

A detailed analysis of the findings is discussed in Chapter 4. The relatively small sample size limits the stability of the statistical results. Another limitation concerns the possibility of participant forgetfulness which may have led to inaccurate answers on the questionnaires.

This study addressed 12 null hypotheses whose findings are related to relevant literature in the following sections. The first null hypothesis investigated the relationship of

the education program with participants' knowledge. Both the urban and rural experimental groups' mean scores from the KP pretest to the KP posttest increased, although no statistical significance was found, after the treatment was administered. It is possible that further revisions for improvement of the reliability of the KP may increase the mean scores between the KP pretest and the KP posttest with significant results.

Two null hypotheses investigated the relationship between knowledge and compliance. No meaningful correlation was found between these two variables. These findings concurred with the Sackett et al. (1975) study that found an education program did not increase compliance. Another study by McKercher and Rucker (1977) found that knowledge had no significant relationship with compliant behavior. Conversely, Hecht's study (1974), exploring the effects of different amounts of teaching, concluded that errors decreased (compliance increased) as the amount of teaching increased. This literature also can be related to the findings in the following null hypotheses.

The relationship of the education program with compliance was investigated by two null hypotheses. This present study showed no significant increase in median scores between the SRP pretest and SRP posttest. In respect

to pill counts, the PCR showed an increase of 4.8% and 6.8% in the scores of the experimental groups, and an increase of 0.3% and 2.7% in the control groups. Although an increase was found it was not statistically significant.

The sixth null hypothesis tested the correlation between the self-reporting and the pill-counting aspects of compliance. This study revealed a correlation of $r = 0.538$, or a $r^2 = 0.289$. Literature showed that personal perception of one's compliance may vary from one's actual compliant behavior. Åberg (1977), Fletcher, Pappius, and Harper (1979), and Marston (1970) indicated that pill counts were more valid than self-reporting in the measurement of compliance.

The remaining six null hypotheses addressed the existence of any relationship of demographic/compliance-related variables with knowledge and compliance. No significant relationships were identified. This concurred with other research (Davis, 1968). Schwartz et al. (1964) as well as Neely and Patrick (1968) found number of prescribed medications to be associated with noncompliance. Schwartz et al. (1964) also found household composition related to compliance.

Conclusions and Implications

Conclusions

The conclusions drawn from the findings of the study are as follows:

1. The education program, Elder-Ed, did not improve the knowledge at a statistically significant level; however the raw scores did indicate some improvement.

2. Compliance was not significantly increased after the presentation of the program.

3. Part of the film's terminology was judged by the researcher to be at a level of comprehension above that of many of the participants. This may be responsible for the lack of any significant increase in knowledge and compliance.

4. The correlation between education level and knowledge was $r = 0.428$, $p = .02$. The association between the participants' education level and knowledge explained 18.3% of the variance.

5. There were no other significant relationships between any demographic/compliance-related factors and knowledge or compliance.

6. The two measurements of compliance, self-reporting and pill counts, correlated at $r = 0.538$, $p = .005$. The explained variance between the two aspects of compliance equaled 28.94%.

Implications

The results of this study have implications for many health professionals. Continued research in the area of medication compliance/noncompliance is indicated.

Since neither the structured education program, nor the participants' knowledge showed any effect on compliance, health professionals must continue to search for a solution to the puzzling compliance issue. Application of reliable findings must be reflected in practice. Although this study has not indicated a relationship between this specific education program and compliance, other studies have shown significant relationships. Consumer education needs to continue to be part of health planning.

Community health education must be formulated to meet the needs of individual target populations. Written materials need to be constructed at the reading level of the target population. Since understanding is a necessary element to the full cycle of communication, it must be considered as an objective in planning education programs. The Elder-Ed program, which includes a film and written material, may need revision, if other research is indicative of findings similar to this study.

Nursing involvement in the assessment, planning, implementation, and evaluation of community programs is indicated. The attainment and maintenance of a maximum level of total wellness by purposeful intervention to reduce stress and adverse conditions (Neuman, 1974) through nursing actions can be considered a major nursing role. The nursing role applies to the individual consumer and to consumer

groups. With theoretical knowledge about community concepts and with the pursuit of the expanded nursing role, nurses can achieve the credibility needed to become instrumental in improving the health of the community.

Recommendations for Further Research

Based on the results of this study, the following recommendations are made for further research:

1. A replication study is indicated using a larger and different sample, in order to further evaluate the effectiveness of the Elder-Ed program. The following changes should be considered in the replication study:

a. The KP should be revised in an attempt to achieve an acceptable level of reliability.

b. More time should be allotted during the treatment administration to the review of the Elder-Ed written materials to help those participants with difficulty reading.

2. Further research is indicated to establish criterion-related validity of instruments measuring compliance.

3. Studies about compliance are indicated to gain further insight about compliance/noncompliance related factors.

4. The homebound, a different population of elderly persons, need to be studied regarding their compliance levels.

5. A similar study should be conducted on a sample of elderly persons with a broader range of educational levels.

6. Studies investigating the relationship between attitudes and compliance are recommended.

7. The nurse/consumer relationship as a factor in medication compliance should be explored.

8. Studies probing the role of the nurse as an educator of consumers are indicated.

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

H-GAC AAA NUTRITION SITES

H-GAC AAA NUTRITION SITES

Urban

Freeport
La Marque
Brazoria
Rosenberg
M. I. Lewis
Nessler
Hitchcock
Kempner
Wessley
Liberty
Conroe
New Caney
Woodlands
Jerusalem
Arcola
Kendleton

Rural

Palacios
Wharton
Van Vleck
Bay City
El Campo

APPENDIX C

HUMAN RESEARCH REVIEW COMMITTEE APPROVAL

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

STUDENT'S NAME Halyna I. Stegura

PROPOSAL TITLE "Effectiveness of 'Elder-Ed' Program on
Knowledge and Medication Compliance: An
Evaluation"

COMMENTS: _____

DATE: March 14, 1980

[Signature]
~~Disapprove~~ Approve

[Signature]
~~Disapprove~~ Approve

[Signature]
~~Disapprove~~ Approve

[Signature]
~~Disapprove~~ Approve

APPENDIX D

AGENCY PERMISSION FORM

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 Halyna Stegura
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) ~~(may not)~~ be identified in the final report.
2. The names of consultative or administrative personnel in the agency ~~(may)~~ (may not) be identified in the final report.
3. The agency (wants) ~~(does not want)~~ a conference with the student when the report is completed.
4. The agency is (willing) ~~(unwilling)~~ to allow the completed report to be circulated through interlibrary loan.
5. Other _____

Date: March 17, 1980

Steve Howard
Signature of Agency Personnel

Halyna Stegura
Signature of Student

William E. Benedict
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.

APPENDIX E

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

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 F

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 Halyna Stegura 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."



Ms. B. Affleck

3-3-80

Date

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

^aX = number of pills in medicine bottle; Y = number of pills that should be in the medicine bottle.

APPENDIX H

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 I

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 J

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, Halyna Stegura, 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 Wise Use of Drugs: A Program for Older Americans. 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.

Consent Form
TEXAS WOMAN'S UNIVERSITY
HUMAN SUBJECTS REVIEW COMMITTEE

(Form B)

Title of Project: "Effectiveness of 'Elder-Ed' Program on
Knowledge and Medication Compliance: An
Evaluation"

Consent to Act as A Subject for Research and Investigation:

I have received an oral description of this study, including a fair explanation of the procedures and their purpose, any associated discomforts or risks, and a description of the possible benefits. An offer has been made to me to answer all questions about the study. I understand that my name will not be used in any release of the data and that I am free to withdraw at any time. I further understand that no medical service or compensation is provided to subjects by the university as a result of injury from participation in research.

Signature

Date

Witness

Date

Certification by Person Explaining the Study:

This is to certify that I have fully informed and explained to the above named person a description of the listed elements of informed consent.

Signature

Date

Position

Witness

Date

One copy of this form, signed and witnessed, must be given to each subject. A second copy must be retained by the investigator for filing with the Chairman of the Human Subjects Review Committee. A third copy may be made for the investigator's files.

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