EFFECTS OF INSTRUCTIONAL PACE AND TASK ELABORATION ON GERIATRIC CLIENTS' LEARNING ABOUT MEDICATION

By

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DEDICATION

I dedicate this dissertation to God: Father, Son, and Holy Spirit.

I give glory to the source of all truth.

I give glory to the greatest teacher.

I give glory to the eternal counselor.

I thank the Father for His gift of perfect love.

I thank the Son for His gift of peace.

I thank the Spirit for His gift of comfort.

I praise God, my light in the darkness, whose right hand upholds me.

I praise the Spirit who guides mankind into all truth.

I praise the Prince of Peace who helps us choose to love each other.

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The purpose of this study was to determine whether slowing the pace of medication instruction delivery, or increasing the preciseness of task elaborations, or an interaction of the two factors could be effective in facilitating learning for noninstitutionalized geriatric clients. The effects of verbal instructional pace and task elaboration precision were assessed using an instructional program of diuretic medication information designed for use with older learners.

The investigation took place in an urban retirement community of 500 older adults responsible for independent management of their medication regimens. Residents meeting sample selection criteria of a minimum age of 62 years, ability to use the English language, mental status orientation, and absence of uncorrected sensory impairments (N = 20) volunteered participation. The typical subject was female,

77 years old, and took two prescription medications. The investigator developed a multiple-choice examination to measure subjects' knowledge about diuretic medication at pretesting and posttesting. Pretest scores served as a covariate to control for differences in subjects' initial levels of medication knowledge. Two independent variables, each with two levels, were studied. Slow and normal pace of instruction and precise and imprecise task elaboration were the levels investigated. The dependent variable was the posttest score of diuretic medication knowledge.

The instructional factors of pace and task elaboration precision were tested through an experimental multigroup pretest-posttest design. Subjects were randomly assigned to one of four treatment conditions: normal pace/imprecise elaboration, normal pace/precise elaboration, slow pace/imprecise elaboration, and slow pace/precise elaboration. The normal pace/imprecise elaboration treatment served as a control representing the usual method of client health teaching.

Data were analyzed using a two-way analysis of covariance. Although at the .05 level no treatment effects due to instructional pace, task elaboration precision, or an interaction of the two factors were statistically significant, a trend in the observed means supported the inference of the effectiveness of a slow instructional pace and precise task elaboration. Additional research substantiation of the factors of pace of instruction and task elaboration precision with older learners is indicated.

CHAPTER I

INTRODUCTION

Background of the Problem

Drug misuse by older Americans is a widespread and dangerous phenomenon. The rapid growth of the older adult population and the accompanying increase in chronic health problems have created a major health issue. In 1900, three million Americans were 65 years or older, comprising 4% of the population. In 1984, 26 million, or 11.5% of the population, were 65 or older (Office of Technology Assessment, 1984). The proportion of deaths from chronic illnesses such as heart disease, cancer, and stroke has increased more than 250% since 1900. Of persons aged 65 or older, 86% have one or more chronic illnesses, most of which require drug therapy (German, Klein, McPhee, & Smith, 1982). The presence of chronic health problems predisposes older persons to extensive drug use for excessing periods of time. The synergism of a pattern of higher utilization of medications by the elderly due to the prevalence of chronic illness, altered physiologic responses to drugs due to the normal aging process, the practice of health care providers of overprescribing medication, and inappropriate self-medication practices of older persons results in dangerous patterns of drug misuse.

Drug misuse, the inappropriate use of legal prescription and nonprescription drugs, has a variety of causes. No universally accepted theory on drug misuse by older persons exists (Solomon & Weiner, 1983).

Patterns of Drug Use

Overall drug use patterns among the aged reveal that those over the age of 65 account for 25% of the drugs used in the United States (Eliopoulos, 1979). Elderly ambulatory and hospitalized clients frequently require medication on a routine, long-term basis to maintain their health. Those over 65 are the largest group of users of prescription medication (Ebersole & Hess, 1981). Data also indicate that the aged ingest a disproportionate amount of over-the-counter drugs when compared with the general population (Petersen & Thomas, 1975). Investigators estimate that adverse drug reactions are responsible for from 3% to 5% of all hospital admissions and that the proportion is higher among the elderly (Caranasos, Stewart, & Cluff, 1974).

Physiologic changes that occur as a natural result of the aging process profoundly affect the body's ability to handle medications. Drug absorption, distribution, metabolism, and elimination are factors that contribute to the aging body's variable ability to use medications.

Appropriate medication dosages for the elderly have been identified for only a few medications (Pagliaro & Pagliaro, 1983). Some drug misuse occurs when health care providers prescribe drug dosages suitable for younger adults. Health professionals are

accountable for prescribing medication regimens that provide optimum therapeutic benefit with a minimum of adverse effects.

Compounding the physiological effects of the aging process on drug utilization and the higher occurrence of chronic health problems among the elderly is drug misuse due to the practice of polypharmacy. Polypharmacy is defined as the "administration of excessive medications" (Dorlands Illustrated Medical Dictionary, 1981, p. 1050). Although some increased drug prescribing is justified because of the prevalence of chronic illness among the elderly, "substantial evidence" exists that health care providers overprescribe drugs (Friesen, 1983, p. 265). The outcome of polypharmacy for the aged is a high risk for adverse drug reactions and interactions.

A number of studies (e.g., Kendrick & Bayne, 1982; Latiolais & Berry, 1969; Olson & Johnson, 1978) document that errors in self-administration of medication by older clients are common and potentially serious. A sample of prevalent inappropriate self-medication practices includes taking medications according to the size or color of the drug, taking borrowed medications, taking more or less medication than prescribed, taking medications at the wrong time, failing to take prescribed medications, taking medication with incorrect knowledge or no knowledge, taking medications for the wrong purpose, and self-medicating with over-the-counter drugs. Because 95% of older adults live outside institutions and have the responsibility for their own health and medication management (Solomon & Weiner, 1983), research is needed to identify effective methods of medication instruction for older adults.

Instructional Pace

The concept of teaching older persons at a slower than normal pace appears intuitively sound. The gerontological literature recommends a slower rate of speaking as an instructional strategy (Oppeneer & Vervoren, 1983). Health educators' acceptance of an instructional strategy based on tradition or intuition alone is inappropriate. A research base to confirm objectively that instruction at a slower pace is more effective than instruction at a normal pace is lacking.

Kim and Grier (1981) found that instructing older clients at a slower speed was an important variable in the ability of an individual to remember information about medication. Because the results of a single study are not considered as conclusive evidence by the research community, this investigator sought to identify support for acceptance of a slow instructional pace as an effective learning variable. This investigator extended the examination of instructional pace to a noninstitutionalized client population. This writer, in addition, examined the interaction effects due to treatment combinations of instructional rate and task elaboration precision, another learning variable.

Precision of Task Elaboration

This investigator questioned whether task elaboration precision described in the educational psychology literature could facilitate learning for older adults. No researchers have reported investigations of task elaboration precision in client health education or with older adult learners in the literature surveyed.

Bransford, Stein, Vye, Franks, Auble, Mezynski, and Perfetto (1982) investigated the effectiveness of precise and imprecise elaborations (explanations) on learning by fifth graders. They defined precise elaborations of materials or tasks as ones that "enhance the significance and reduce the arbitrariness" of what is to be learned (p. 394). They observed that learners who use mnemonic techniques to remember new facts often do not understand the significance of the facts. The goal of their investigation was to explore processes necessary to the understanding of material to be learned, rather than to mere memorization of the material. They concluded that precise elaborations were more effective than imprecise elaborations in facilitating learning for less academically successful students.

Medication instructional practices should aim for client understanding, not merely for memorization of drug information. Older adult clients responsible for their medication regimens need to be assisted toward an understanding of pertinent information such as medication purpose, side effects, and special administration considerations. This writer hypothesized that precise explanations about medications would enhance the significance and decrease the apparently arbitrary requirements of taking the prescribed drug.

Promotion of effective medication-taking practices is one facet of the health care issue of drug misuse by older Americans to which health care professionals must give a high priority. Health care providers, as client educators, have an important role to play in recognizing and addressing the established need for identifying

effective medication instructional practices for older learners. If clients are to assume total responsibility for accurate management of their medication regimen, health professionals must be accountable for enabling them to fulfill this requirement. Client medication knowledge is one tool with the potential for reducing medication errors made by older persons. Effective medication knowledge is a forerunner of a client's compliance with a medication regimen. Although knowledge cannot guarantee client compliance, it is a necessary prerequisite. Health professionals cannot expect clients to comply with a drug regimen they do not understand.

Statement of the Problem

Drug misuse by the elderly is a complex, urgent issue in America today requiring intervention by health care professionals. Health care providers are accountable for reducing the incidence of drug misuse in the older population. Identification of effective medication instructional methods for geriatric clients is one strategy for addressing the health care issue of drug misuse by older persons.

The widespread misuse of drugs among the elderly mandates that health professionals assume responsibility for educating clients to successfully manage drug regimens. A discrepancy exists between the need for health professionals to provide older clients with medication instructions and the identification of instructional methods that are effective with older learners. To facilitate learning for older adults, modifications in traditional instructional methods may be necessary.

The problem the investigator addressed in this study was the need for research-substantiated information about instructional strategies that are effective for increasing geriatric clients' knowledge of medications.

Purpose of the Study

The purpose of the study was to determine whether slowing the pace of medication instruction delivery, or increasing the preciseness of task explanations, or a combination of the two could facilitate learning for noninstitutionalized geriatric clients. The investigator developed and field-tested an instructional package for geriatric client medication education. The two factors in the study were instructional pace and task elaboration precision, hypothesized to be instrumental in promoting effective learning for older adults.

The investigator selected diuretic medication information as the focus of the instructional package based on an identified need in the literature. A survey of drug use among geriatric clients revealed that diuretics were by far the most widely prescribed medications (Williamson & Chapin, 1980). Additionally, diuretics constitute one of four classes of drugs that cause 50% of all adverse reactions in clients in institutions (Cheung, 1979).

The investigator examined the effects of medication instruction delivery at slow and normal rates of speaking and under conditions of precise and imprecise task elaborations. The instructional variables of pace and task elaboration precision are amenable to control by client health educators.

Hypotheses

The study involved the testing of the following three hypotheses:

1. Older adults instructed at a slower rate of speaking will earn higher adjusted mean scores on a test of medication knowledge than those instructed at a normal rate of speaking.

2. Older adults instructed with precise task elaborations will earn higher adjusted mean scores on a test of medication knowledge than those instructed with imprecise task elaborations.

3. No interaction effect due to treatment combinations of medication instructional rate and precision of task elaboration will occur.

Significance of the Study

This study adds to the sparse literature on instructional practices tailored to the learning needs of geriatric clients. The study was designed to advance the knowledge base concerning instructional conditions that facilitate learning by older adults. Additionally, the investigator designed the study with the hope of providing health care professionals and their geriatric clients a viable strategy for reducing the incidence of drug misuse due to inadequate medication knowledge.

Assumptions Underlying the Study

The assumptions underlying this study were as follows:

1. Individuals have a right and a responsibility to be active participants rather than passive recipients in managing their medication regimens.

2. Health professionals are accountable for educating older adults to assume an increased responsibility for managing their medication regimens.

3. Older adults are capable of learning the knowledge essential to self-management of medication regimens.

Limitations and Delimitations

Limitations

The study took place in a retirement community of 500 independent older adults. Conducting the study in the natural setting of the retirement community provided the advantage of demonstrating practical applicability. It had the disadvantages of a nonrandomized sampling procedure and restricted generalizability of findings.

Certain variables that are unique to a sample of older subjects may have influenced the results of the study, but were not controlled in the research design. Sixty percent of the sample consisted of old-old subjects. The term old-old is used in the gerontological literature to describe individuals over age 75 (Murray, Huelskoetter, & O'Driscoll, 1980).

The investigator recognized in advance that the test-taking skills of older learners are different than those of younger learners. The oral and written instructions for the data collection instruments given to the study participants did not include the term test. The word survey was substituted for pretest and posttest. In spite of this control, subjects demonstrated that they felt they were being tested by asking the investigator what to do if they did not know the "right" answer. The subjects displayed hesitancy in using the

principle of attempting to guess the best response when unsure of a correct answer.

Although the investigator explained and reinforced the rationale for assessing diuretic medication knowledge before and after the instruction, some of the study participants voiced a reluctance to complete the posttest. Individuals who viewed posttesting as repetitive may not have been motivated to accurately complete the posttest.

Delimitations

This study included a nonrandomized sample population of older adult residents of a retirement community. Participants met predetermined sample selection criteria of age, mental status orientation, ability to use the English language, and absence of severe uncorrected sensory deficits.

The investigator employed procedures to control for relevant pre-existing differences between the subjects of the study. The use of random assignment of subjects to treatment groups was one method of experimental control. Analysis of covariance was the statistical method used to control initial differences in medication knowledge of subjects.

The experimenter attempted to obtain a representative sample of the retirement community residents by placing announcements of the instructional offering under each apartment door and by posting additional announcements in strategic locations throughout the community one week in advance of data collection. Residence administrators were asked to provide input about an appropriate

meeting time and place. Conducting data collection at a time acceptable to a majority of residents and using familiar conference rooms were measures designed to encourage participation.

Thirty individuals came to the instructional offering. Ten residents who wanted to participate were not included in the sample. Those 10 individuals either did not meet the sample selection criteria or could not be present during the entire data collection period. The 20 subjects participating in the study were randomly assigned to one of four learning conditions.

The investigator developed the medication instructional package and the data collection instruments. Three assistants received a 1-hour orientation to the data collection procedures.

The investigator tape recorded the medication instructions in order to control the pace and precision learning variables. In order to isolate the effects of speaking pace and task elaboration precision on learning, the experimenter did not provide the subjects with written medication instructions until the data collection period was concluded.

Definition of Terms

The following terms are defined as they are used in this study.

Client is used to identify a health care consumer. The client is not "a passive recipient of services but an active participant" in self health management (Carpenito, 1983, p. 2).

Client compliance is used to mean "the extent to which the patient's behavior coincides with a clinical prescription" in

terms of taking medications appropriately (Sackett & Haynes, 1976, p. 54).

Diuretic is a prescription medication referred to by lay persons as a water pill. "Diuretics act on the kidneys, causing them to eliminate salt and water from the body through the urine" (Consumer Drug Digest, 1982, p. 9).

Geriatric client is used to mean health care consumers 62 years of age or older.

Noninstitutionalized is used to describe older adults not living in an institution who are responsible for their own health and medication management.

Older adult is any individual 62 years of age or older. The terms aged, elderly, old, older adult and older person are used interchangeably. These terms may be defined differently by gerontologic investigators.

Normal pace of instruction is a description derived from the speech literature of a speaking delivery rate of 159 words per minute (Kelly & Steer, 1949). The speaking delivery rate of the medication instructions was 159 words per minute.

Slow pace of instruction is the speaking delivery rate of medication instructions of 100 words per minute.

Elaboration is the term used in the educational psychology literature to mean an explanation (Stein et al., 1982).

Imprecise task elaborations are explanations that do not enhance the significance or reduce the arbitrariness of facts to be learned. Memory performance for facts is not as good for imprecise elaborations as it is for precise elaborations (Bransford et al., 1982).

Precise task elaborations are effective explanations that enhance the significance and reduce the arbitrariness of facts to be learned. Memory performance for facts is better for precise elaborations than for imprecise elaborations (Bransford et al., 1982).

Diuresis is the elimination of body fluids produced by ingestion of a diuretic.

Organization of the Study

This chapter contained an introduction to the study, an explanation of the problem, and a statement of the hypotheses to be tested. Chapter II is a review of the literature related to drug misuse by the elderly and to the effects of medication instruction for older learners. Chapter III includes research methodology, instrumentation, data collecting procedures, research design, and data analysis. Chapter IV is a presentation of descriptive and statistical results. Chapter V contains a summary of findings, implications of the study, and recommendations for future research.

CHAPTER II

REVIEW OF THE LITERATURE

Demographics of Aging and the Need for Medication Instruction

Medication instruction for aged clients comprises an increasingly important aspect of health care. One reason health practitioners are becoming increasingly concerned with this area of health education is that the elderly population is constantly growing. "Never before have there been so many old people, either numerically or proportionately, nor have they lived to be so old" (Oppeneer & Vervoren, 1983, p. 1). The aged constitute more than 11.5% of the current United States population (Office of Technology Assessment, 1984). More than 32 million people are over the age of 60, 23 million are over 65, and between 29 and 33 million will be over 65 by the year 2000 (Weg, 1978). By 2010, an estimated 39.3 million will be over 65, and they will constitute almost 14% of the nation's population (Office of Technology Assessment, 1984). The 75-year and older and 85-year and older groups are increasing; more than 6 million persons are between 75 and 84, and approximately 2 million are 85 or older (Murray, Huelskoetter, & O'Driscoll, 1980).

Drug Misuse by Older Adults

The current and projected growth of the older population has stimulated research on the medication-taking practices of the aged. A growing body of literature documents the fact that drug misuse by older adults is a serious problem requiring the attention of health professionals. In the present study the term drug misuse refers to inappropriate use of legal drugs, rather than to illicit drug use.

A review of drug usage patterns among the elderly demonstrated that one reason for drug misuse is the large volume of medications purchased by older persons. Vestal (1978) identified that in 1976, although the aged constituted approximately 11% of the U.S. population, that group spent 25% of the national total of $11.2 billion for drugs. He projected that if current trends continued, by the year 2030, expenditures for drugs by older Americans might constitute more than 40% of the national total. Simonson and Pratt (1981) found that 85% of the older population took at least one prescription. Stated another way, people over 65 "take more than three times as many drugs as their juniors" (Mullen & Granholm, 1981, p. 108).

Prescription patterns reflect the distribution of chronic illnesses in the U.S. population. Most chronic illnesses require treatment with more than one medication and for long durations. Smith (1979) reported that upon hospital discharge 25% of individuals over 65 received prescriptions for six or more drugs, whereas only 3% of persons aged 17-44 did so. Krupka and Vener (1979) found that noninstitutionalized older clients took an average of 5.6 drugs daily:

2 prescribed, 1.8 proprietary (over-the-counter), and 1.8 social drugs, such as nicotine and alcohol.

Guttman (1977) surveyed 447 persons over the age of 60 in Washington, D.C., and reported that 62% used daily prescriptions and 69% used proprietary drugs. A 1978 study of drug usage patterns among well elderly did not classify a single participant as being drug free. Of those studied, 71% used prescription medications and 54% used proprietary drugs. Almost one in four participants in the study were taking four prescription medications (Seniors and Substance Abuse Task Force, 1978). These studies confirm the extensive drug use by the elderly. In terms of sheer numbers of medications consumed, older persons are at a high risk.

Adverse Drug Reactions

Adverse reactions to medications pose a serious health problem for aged clients. As a person ages, the possibility of experiencing a drug reaction is increased. Simonson and Pratt (1981) reported that because age-related changes affect the absorption, distribution, metabolism, and excretion of many medications, adverse reactions occur twice as often in elderly individuals as in the younger population. Pagliaro and Pagliaro (1983) identified that the frequency of adverse drug reactions is two to five times greater in the older adult than in the younger adult. The higher incidence of adverse drug responses among aged individuals can be explained partially by the following causes: altered physiological responses due to the aging process, the larger amount of drugs ingested, and drug interactions due to the concurrent use of several medications.

Donahue, Girton, Baumler, Moerhlin, and Strayer (1981) added two causes to the above list: the effects of existing disease states and self-medication with over-the-counter drugs. They also cautioned that drug-induced illnesses may not be detected in the elderly when the symptoms are ones frequently attributed to aging, such as forgetfulness, weakness, and confusion.

Another major contributing factor to the increased incidence of adverse drug reactions among the elderly is polypharmacy. Polypharmacy involving prescription and nonprescription medications is common in the elderly (Pagliaro & Pagliaro, 1983). Polypharmacy is partly the result of a lack of coordinated health care management. The primary health care provider for a given geriatric client often has minimal contact with the older person and, as a consequence, may elicit an incomplete medication history. If the older client then goes to a different health care specialist for treatment, more medications may be prescribed. If health providers are unaware of concurrent medication usage, they may add new drugs before conducting a complete assessment of an existing drug regimen. The scenario can become even more complex if adverse drug reactions mimic physiological complaints and are treated with additional medications. In essence, additional drugs may be prescribed for each apparently new symptom when, in reality, the side effects of the original medication are causing the symptom. Torres (1983) cautioned that not only does polypharmacy increase the risk of drug interactions, it also reduces the level of geriatric clients' compliance with a drug regimen.

More than one million persons annually experience an adverse drug reaction which results in approximately 30,000 deaths (Pietrusko,

1982). Adverse drug reactions are reported to affect 90% of the elderly, 20% of which result in hospitalization (Sivertsen & Fletcher, 1982). Thus, the fact that the proportion of drug-induced illnesses is greater in individuals over 61 years of age than for those under 61 is understandable (Caranasos, Stewart, & Cluff, 1974). Each of the identified factors--from an expanding aged population with its concomitant increased prevalence of chronic illness, to physiologic vulnerability, to adverse drug reactions associated with the aging process, to the practice of polypharmacy--highlights the need for health educators to ensure that older clients receive appropriate medication instructions.

Etiologies of Drug Misuse--Noncompliance

Noncompliance with a clinically prescribed regimen is considered a misuse of drugs. That many older clients have difficulty taking medications as prescribed by their health providers is well documented. In 1975, the National Institute on Drug Abuse concluded that elderly clients' noncompliance was a serious issue, in that 25% to 60% of clients made errors in self-administration of prescriptions (National Institute on Drug Abuse, 1975). Since 1962, researchers have reported evidence that the elderly tend to make errors in self-administration of medications. Based on a review of medication histories of 178 chronically ill ambulatory clients aged 60 or older in the General Medical Clinic at New York Hospital, Schwartz and her associates found that 59% made one or more medication errors and 26% made potentially serious errors. The average number of mistakes was 2.6 errors per error-making client. The most frequent error was omission of

medications, followed by lack of knowledge about medications, use of medications not prescribed, and errors of dosage, sequence, or timing (Schwartz, Wang, Zeitz, & Goss, 1962). Neely and Patrick (1968) reported similar results, confirming that older persons living at home made mistakes in self-administration of medications. The probability of errors increased with the number of medications taken. Parkin and associates found that 66 of 130 clients deviated from the drug regimen prescribed at hospital discharge. The investigators found noncompliance of instructions more frequently than failure to follow instructions (Parkin, Henney, Quirk, & Crooks, 1976).

In conducting medication studies, researchers who categorized types of errors found that clients made one or a combination of the following types of medication self-administration errors: omission, inaccurate knowledge, incorrect dosage, improper timing and sequence, and medication taken but not prescribed (Stewart & Cluff, 1972). This categorization was probably derived from the categories of medication errors originally established in the classic 1962 study by Schwartz and her associates.

Alternate Etiologies of Drug Misuse

Olson and Johnson (1978) described other patterns of drug misuse in the elderly: unintentional overdosage (by health provider or client), duplication of prescriptions, drug exchange with others, confusion due to organic mental causes, expired medications, and automatic refills. Oppeneer and Vervoren (1983) identified additional factors affecting compliance with a drug regimen by the elderly,

including fear of drug dependency, nature of the disease, difficulty with childproof containers, and the high cost of prescriptions. Other factors influencing an aged person's potential for drug misuse are altered mobility, diminished vision and hearing (Ellor & Kurz, 1982), use of two or more pharmacies (Raffoul, Cooper, & Love, 1981), and doctor-patient miscommunication (Hulka, Kupper, Cassel, Efird, & Burdette, 1975).

Medication Errors Due to Inadequate Medication Knowledge

While an understanding of the various etiologies of drug misuse is important, the present study was limited to misuse due to ineffective medication instructions. In other words, older clients must possess adequate medication knowledge in order to accurately comply with a medication regimen. Clients cannot be expected to comply with a regimen they do not understand.

In 1978, Lundin in a study of 50 independent older adults found that none of the subjects received adequate instruction to ensure appropriate medication use. Of 170 prescriptions that participants were taking, 110 prescription labels had no directions or read "take as directed." Many participants denied having received verbal or written medication instructions.

Inadequate client medication knowledge is one important factor related to the occurrence of self-administration of medication errors. Investigators have demonstrated that as the client's knowledge of medications increased, the tendency to make medication errors decreased (e.g., Boyd, Covington, Stranaszek, & Coussons, 1974; Kendrick & Bayne, 1982; Latiolais & Berry, 1969; Malahy, 1966).

In two studies conducted by the same core team of researchers (German, Klein, McPhee, & Smith, 1982; Klein et al., 1982), the investigators found no significant relationship between health knowledge and medication compliance. The lack of significant findings in those two studies may be partially attributed to the questionable reliability of self-reported compliance measures. A premise of the present study was that although medication knowledge may not guarantee client compliance with a drug regimen, it is a necessary prerequisite to the accurate management of a medication regimen by older persons.

Clients may possess inadequate medication knowledge if the health provider fails to give instructions in a clear, specific manner or to speak clearly and slowly (Oppeneer & Vervoren, 1983). Pavkov and Stephens (1981) identified that inaccurate medication knowledge leading to drug misuse can occur if unclear medication instructions are provided, if the client is not informed about a drug's desired effects, or if information about specific precautions, such as how to avoid drug or food interactions, is not included.

Ebersole and Hess (1981) questioned how older clients can be expected to avoid drug misuse considering the traditional circumstances of medication instruction delivery.

> How can anyone comply if the directions are. . . presented in a rapid-fire fashion and in medical jargon? It is common . . . to give discharge medication instructions as the person leaves the hospital. It is also common to . . . give directions concerning medications when the patient is physically uncomfortable, or to explain in a noisy or busy place. (p. 177)

The Client Educator Role of Health Professionals

Of all Americans over 65 years of age, 95% live in the community in their own residences or with relatives and friends (Olson & Johnson, 1978). Health maintenance of these noninstitutionalized individuals requires client self-care activities. "First in importance of these self-care activities are medication-taking regimens" (Dall & Gresham, 1982, p. 283). In order to become compliant with their prescribed medication regimens, clients must be able to surmount the difficulties of managing self-administration of medications. Medication instructions can be a medium for enabling older clients to effectively assume the responsibilities of self-medication administration.

Health professionals are accountable for providing client education. Many professional groups have published official statements delineating client education responsibilities. Client medication instruction delivery requires the collaboration of various health team members. Nurses, physicians, and pharmacists are three examples of health team members who assume responsibility for providing medication instructions. The Model Nurse Practice Act of the American Nurses' Association defines client education as a component of the registered nurse's practice (American Nurses' Association, 1979). The statement of the American Medical Association on the physician's role in client education addresses the responsibility of providing clients with education services to help them manage individual health (American Medical Association, 1975). Pharmacists are accountable for educating clients about each medication in the prescribed drug regimen (American Society of Hospital Pharmacists, 1976).

Alford, a registered nurse and gerontological nurse clinical specialist, has developed a Bill of Rights for the elderly on drug therapy. One of the rights of older persons she formulated was to "Know what he is being medicated with and why" (Alford & Moll, 1982, p. 282). The medication errors the elderly make due to too rapid or poor explanations could potentially be avoided if health professionals consistently gave effective medication instruction to older clients.

Age and Learning Ability

Additional research is needed to document the effectiveness of teaching in reducing the incidence of medication errors among the elderly. This study included two instructional variables hypothesized to be effective in facilitating learning for older clients.

German (1978) identified that a force mitigating against interest in health education for the elderly has been "the widely held belief that learning processes deteriorate with age, that memories are failing, and that . . . old age brings loss in control over minds and bodies" (p. 269). The belief in an inevitable intellectual decline in the aged is not consistently supported by research findings (Sakata & Fendt, 1981). The American Psychological Association Task Force on Aging recommended to the 1971 White House Conference on Aging that the decline in intellectual functioning among the aged was attributable to poor health, social isolation, economic plight, limited education, lowered motivation, or other variables not intrinsically related to aging (Eisdorfer & Lawton,

1973). To date, research findings remain inconclusive about the effects of aging on the intelligence and memory of healthy older adults. Even if investigators later document significant, inevitable changes in cognitive performance of older learners, health educators need to be aware that cognitive performance is potentially modifiable. Arenburg and Robertson-Tchabo (1980) postulated that modifiability of cognitive performance in older adults is possible through restructuring the task or environmental conditions, or by specific cognitive skill training. Health educators must not base their teaching practices on a belief that older adults are unable to learn.

Although the decline of learning ability with age may not be inevitable, this does not mean that aging has no effect on learning processes. Birren and Renner (1977) reported that one established phenomenon of aging is the tendency toward slowness of perceptual, motor, and cognitive processes. Some research findings attribute the slowing of an aged person's responses in the performance of cognitive skills to alterations in the central nervous system (Birren, 1964; Botwinick, 1973). Other investigators have suggested that at least part of the slowing may be the result of a tendency of older learners to respond more slowly in order to assure accuracy of their responses (Botwinick, 1973; Welford, 1977).

The greatest decline in learning ability occurs for tasks that are abstract and fast paced. Older people perform better on concrete rather than abstract tasks. Botwinick (1978) found that meaningfulness of the material to be learned was a critical factor affecting learning ability in the aged. If learning tasks appear

abstract and irrelevant, the older individual may not be motivated to learn.

Learning is adversely affected when the pressure of a time constraint is imposed on an older person. Speed of learning involves reaction time to perceive the stimulus, time to encode the message, and response time to carry out an action. Stated another way, older people need additional time to process information and then respond. According to Oppeneer and Vervoren (1983), the increase in reaction time demonstrated by older adults is minimal for simple learning tasks, but becomes greater as the task gets more complex. The more choices that are involved in a learning task, the longer the aged person takes to react. Research findings suggest that older adults do poorly on rapidly paced learning tasks because of insufficient time to respond rather than as a result of an impaired learning ability (Knox, 1977; Woodruff & Birren, 1975). Knox (1981) found that older adults learned most effectively when they set their own pace. He reported that the speed at which learning occurs is a major age-related influence on learning effectiveness of older persons. Allowing the older adult sufficient response time can facilitate learning performance. Health educators need to recognize that older adults generally require more time to complete learning tasks and usually do not perform as well as young adults under conditions requiring speeded task completion within preset time periods (Baltes & Schaie, 1974; Kimmel, 1980).

The Effects of Instructional Pace on Learning

Pace of medication instruction was one of two learning variables examined in this study. As stated in Chapter I, the concept of teaching older learners at a slower than normal pace in order to facilitate learning appeared intuitively sound, but lacked research verification. Optimally, health educators' acceptance of a modification in instructional strategy for older learners should be based on objective findings that can be replicated. The gerontological literature contains recommendations that teaching at a slower pace helps the learning process in older adults (Hallburg, 1976; Kim & Grier, 1981; Oppeneer & Vervoren, 1983). Oppeneer and Vervoren (1983) cited speed of instruction as an important variable in the learning process of older adults. They explained that because the older learner requires more time for cognitive information processing than does a younger person, that instruction should be presented at a slower pace.

The psychological literature offered potential explanations of the reasons that older learners need additional time to cognitively process information. The following background information is provided to assist the reader in understanding the explanations postulated from the psychological literature. A conceptualization of memory commonly used in research on age differences in memory functioning is based on a three-stage process of encoding, storage, and retrieval. Encoding "refers to the initial establishment of a neural code of the information, storage refers to the preservation of the information over time, and retrieval refers to the recovery and

use of information at the time of testing" (Salthouse, 1982, pp. 133-134). Unsuccessful memory performance by the older learner could be due to a problem in any or all of the three stages.

Research by Sternberg (1975) provided one potential explanation for older learners' need for more time for information processing. He investigated whether with increased age individuals access and use stored memory information at a slower rate. Sternberg found that the time needed to activate information from memory increased by more than 60% from ages 20 to 50. If comprehending a message, such as medication instruction, requires activation of stored information and the duration of that activation is longer with advanced age, older adults will experience difficulty understanding rapid spoken communication. A slower pace of instruction could potentially compensate for the increased time required to retrieve stored information by older learners.

An alternative possible explanation of the older learner's requirement of additional time for cognitive processing of information, documented in several research studies (e.g., Adamowicz, 1976; Kinsbourne, 1973; Kinsbourne & Berryhill, 1972), is derived from the encoding stage of memory. The magnitude of age differences in learning, memory, and comprehension tasks between young and older learners decreased when the rate of stimulus presentation was slower. The less time allowed for the stimulus (information to be learned) to be encoded, the greater the difference in performance between young and old learners. This explanation would seem to suggest that a slow pace of instruction would be beneficial because it would allow additional encoding time for older learners.

Research on age decrements in hearing also suggested a possible rationale for modifying the pace of instruction for older adults. Obler and Albert (1981) reported slowness of neurological response as a major factor in speech comprehension impairment of older adults. Comprehension was defined as all of the processes involved in the reception and understanding of linguistic input. Corso (1977) found that response times to tones gradually increased from young adulthood to the sixties, but increased significantly in the seventies. Bergman et al. (1976) used a combination of cross-sectional and longitudinal studies with 282 adults aged 20 to 80, over an 8-year period. They found that the perception of everyday speech declined significantly with aging for other than optimal conditions, such as person-to-person communication in a quiet environment. Subjects experienced a significant decrement in hearing for speech in their seventh decade. Bergman et al. (1976) also demonstrated that the elderly have a decreased ability to perceive fast speech.

In 1954, an electromechanical method for time comprehension of speech without accompanying frequency distortion was developed. Studies have used the time compression method to evaluate how comprehensible speech remains after time compression results in very fast word rates. Sticht and Gray (1969) conducted the first study researching the intelligibility of time compressed words for young and old normal hearing and sensorineural impaired subjects. Their results were in agreement with those of other researchers (e.g., Bocca & Calearo, 1963) that older persons have special difficulties discriminating rapidly produced speech. The significant contribution

of Sticht and Gray was to demonstrate that the performance of normal-hearing aged subjects who showed no audiogram signs of hearing loss was greatly reduced by the process of time compression. Their results were replicated by Konkle, Beasley and Bess in 1977.

An alternative process of electronic time-expanded speech was developed with the aim of increasing the comprehensibility of speech for the elderly. Marshall (1981) reported that studies investigating the effects of time-expanded speech have not yet produced conclusive results. Panicucci and associates conducted a study on the use of slow speech in health education with the aged. In the clinical setting they found that slow speech increased the aged person's ability to integrate information and respond appropriately. However, in the research study, under controlled conditions, this finding was not upheld (Panicucci, Paul, Symonds, & Tambellini, 1968).

Kim and Grier (1981), studying 45 hospitalized subjects ranging from 65 to 94 years, demonstrated that elderly clients who were instructed at a slow pace had a greater gain from the pretest to the posttest score than those instructed at a normal pace. Their slow pace was a rate of 106 words per minute and the normal pace was 159 words per minute. The instruction provided was for one digitalis, antihypertensive, or diuretic prescription and covered the areas of drug name, purpose, frequency, dosage, and time of administration.

The effects of aging on learning are not clearly understood. The investigation of the variable of pace of medication instruction in this study represented an effort to advance the knowledge base

about instructional conditions facilitating learning for older adults.

The Effects of Precision of Elaboration on Learning

Precision of task elaboration was the second learning variable examined in this study. The investigator postulated that the concept of precision of elaboration, described in the educational psychology literature, was a useful factor to examine in advancing the knowledge base about instructional conditions that facilitate learning for older adults.

A quantitative view of elaboration

Many theorists have emphasized the importance of elaborative encoding activities at the time of acquisition of information (Anderson & Reder, 1979; Bransford, Franks, Morris, & Stein, 1979; Craik & Tulving, 1975). Craik and Tulving (1975) proposed that memory performance depended on the elaborateness of the mental operations carried out at encoding. They believed that the processes of elaboration resulted in a quantitative encoding change. Greater degrees of elaboration at encoding, they argued, lead to the formation of a more distinctive memory trace.

An experiment by Craik and Tulving (1975) tested the quantity of elaborations viewpoint. They manipulated elaboration by varying the amount of information given in acquisition sentences. Subjects were asked to state whether a given target noun fitted into sentences that varied in complexity. For example, a given target noun might be portrait. A simple sentence might be, "She dropped the _____," and a more complex sentence might be, "The old woman limped across the

room and straightened the _____ over the mantel." Subjects were then given the sentences originally heard during the acquisition and were tested for cued recall of the target nouns. There was an increase in cued recall accuracy as the complexity or elaborateness of the sentences increased. If the target noun and the sentence were incongruous (e.g., "She dropped the _____: barn"), cued recall did not increase as the elaborateness or complexity of the sentences increased. Craik and Tulving (1975) thus concluded that greater amounts of elaboration facilitated retention as long as the elaborations were semantically congruous with the information to be learned.

A qualitative view of elaboration

Bransford, Franks, Morris, and Stein (1979) disagreed that the concept of elaboration could be equated with the complexity of the information expressed in semantically congruous sentences. They based their disagreement on the results of experiments such as Stein and Bransford (1979), that suggested that effective elaboration depended on the quality rather than the quantity of semantically congruous information. Effective elaborations, Stein and Bransford, asserted, are those that describe situations in which certain target concepts become relevant or nonarbitrary. The researchers reached these concclusions after testing college students' retention of target words under three types of acquisition conditions. Group 1 heard a list of base sentences such as the following: "The tall man bought the crackers," and "The bald man read the newspaper." Group 2 had the same set of base sentences, but also received elaborations

designed to make the relationship between each man and each activity less arbitrary. For example, the students were given sentences such as, "The tall man purchased the crackers that had been lying on the top shelf," and "The bald man read the newspaper in order to look for a hat sale." On a test of memory performance Group 2 subjects performed better than Group 1 subjects. Memory for Group 2 was enhanced because the elaborations helped the subjects understand the relevance or significance of linking a particular type of man to a particular activity. Group 3 received sentences with semantically congruous elaborations that did not help clarify why it was relevant for a particular man to perform a particular activity. Examples of those sentences were the following: "The tall man purchased the crackers from the clerk in the store," and "The bald man read the newspaper while eating breakfast." The memory performance of Group 3 was poorer than that of Group 1 students who had received only base sentences without additional elaboration. Stein and Bransford (1979) concluded, contrary to the beliefs of Craik and Tulving (1975), that semantic congruity of elaborations does not necessarily lead to increased retention.

From this study and other similar experiments, Stein and Bransford (1979) concluded that one cannot simply equate effective elaborations with the amount of semantically congruous information presented. Instead, "effective elaboration involves the activation of knowledge that helps one realize the unique significance or nonarbitrary nature of target items relative to certain activities" (Bransford, 1979, p. 80). Elaborations are considered to be effective

to the extent that they reduce the arbitrariness of the relations to be learned (Bransford et al., 1982).

Precise elaborations are ones that enhance the significance and reduce the arbitrariness of relations. Other semantically congruous elaborations that do not have those effects are termed imprecise elaborations (Bransford et al., 1982).

The results of Stein and Bransford (1979) provided a framework for Bransford, Stein, and Vye (1982) to explore differences in the ways academically successful and less successful fifth grade learners handled the problem of mastering information that initially seemed arbitrary. The researchers constructed two versions of reading materials unfamiliar to the students. One version described the general functions of a hypothetical robot and the structural properties appropriate to those functions, but it did not elaborate on how the functions were related to the structural properties. The second version included precise elaborations that clarified the significance of the relationship between structure and function, thus making the structural properties less arbitrary. Less successful students were much better able to remember the structural properties of robots and to explain the relationship between structure and function when they were given the precisely elaborated version of the passage than when they were given the arbitrary version.

The results of two additional experiments may assist in clarifying how less successful fifth graders' learning processes approximate those of older learners. Franks et al. (1982) studied learning from explicit versus implicit texts with fifth graders. They

found that less successful students who received passages that contained precisely elaborated relationships (explicit passages) performed significantly better than their less successful peers who received implicit passages. The implicit passages did not contain precise elaborations and thus seemed arbitrary.

Cohen (1981) examined the performance of young and aged individuals on a discourse comprehension task. He found that the young (mean age 23 years) and old (mean age 69 years) adults were comparable at answering questions from text containing explicit information, but that the elderly were significantly disadvantaged at answering questions from implicit text arranged so that the reader must infer relevant information. Cohen also found that age differences were more pronounced with spoken than with a written presentation of material. Although Cohen was not investigating precise elaborations, one might suppose that the elderly subjects in his experiment were disadvantaged at answering questions from a text that seemed arbitrary to them because they had to infer what information was relevant.

One can apply the information about how fifth graders learn and the effects of implicit versus explicit tasks on the learning ability of older persons to the problem of designing an instructional strategy appropriate to the needs of older learners. Bransford et al. (1982) pointed out that people are continually encountering facts and relationships that must be retained in memory, but that seem initially confusing because they appear to be arbitrarily related. The value of precise elaboration lies in enabling

individuals to understand the significance of the apparently arbitrary facts and relationships. As opposed to the process of more memorization of new information, the provision of precise elaborations, through instruction, may allow learners to understand the significance of the facts to be learned.

Older adults responsible for self-administration of medications are faced with learning facts about medications that probably initially seem confusing. At worst, a medication regimen may seem totally arbitrary and incomprehensible. Precise elaborations of medication instructions offer a potential mechanism for reducing the arbitrariness and enhancing the significance of a prescribed drug regimen. If the health care professional assisted older people toward an increased understanding of their medications rather than toward memorization of apparently arbitrary facts about a drug regimen, clients would make potentially fewer medication errors.

Summary

The majority of older adults assume the responsibility of managing self-administration of prescribed medications. Medication errors may occur due to an inadequate or inaccurate understanding of the prescribed drug regimen. Medication instruction by health professionals may be a mechanism to reduce the incidence of medication errors. Modifications in traditional instructional strategies may facilitate learning for older adults. The investigator hypothesized that two instructional variables, pace of medication instruction and precision of task elaborations, were potentially useful strategies to promote effective learning for older clients.

CHAPTER III

METHODOLOGY

The methodology for this research study encompassed two components, the development of an instructional program for geriatric client medication education and the testing of the program to determine its effectiveness in increasing older learners' knowledge of diuretic medications. The purpose of the research was to determine whether slowing the pace of medication instruction delivery, or increasing the preciseness of task explanations, or a combination of the two could facilitate learning for noninstituionalized geriatric clients.

Development of the Instructional Program

The instructional program the investigator developed consisted of the following seven components:

1. Diuretic medication instructions containing precise task elaborations tape recorded at a normal instructional delivery pace.
2. Diuretic medication instructions containing precise task elaborations tape recorded at a slow instructional delivery pace.
3. Diuretic medication instructions containing imprecise task elaborations tape recorded at a normal instructional delivery pace.
4. Diuretic medication instructions containing imprecise task elaborations tape recorded at a slow instructional delivery pace.

5. A client education handout on principles of safe use of medications.

6. A file of resource materials on diuretic medications, other major classes of drugs used by the elderly, and guidelines for safe medication-taking practices for distribution (handout) to older learners.

7. A display of books for use as supplementary resource materials after the instructional treatment.

The medication instructional program was developed from a review of relevant literature (American Society of Hospital Pharmacists, 1980; Consumer Drug Digest, 1982; Loebl & Spratto, 1980; National Institute on Drug Abuse, 1984; Smith, 1977; The U.S. Pharmacopoeial Convention, 1981). The content of the diuretic medication instructions included information on common medication mistakes made by older persons, the purpose of medication, the medication schedule, pertinent side effects and what the client should do about them, special instructions to follow when taking the medication, and instructions for handling omitted medication doses. The content of the diuretic medication instructions was limited to the cognitive learning domain.

The investigator constructed the precise and imprecise task elaboration versions of the diuretic medication instructions using references of research cited in the educational psychology literature (Bransford, Stein, Vye, Franks et al., 1982; Stein & Bransford, 1982). An expert in task elaboration precision reviewed the medication instructions for construct accuracy.

The investigator selected a file of resource materials on diuretics, potassium supplements, other classes of prescription drugs commonly taken by older persons, and guidelines for safe medication-taking practices for distribution to study participants after the instructional treatment. The experimenter distributed written medication instructions after the treatment to enhance clients' knowledge. Although it is recognized that a combination of written and oral instructions is more effective than a single learning strategy (Ojile, 1983), this research was limited to assessment of the effectiveness of learning due to oral instructions. By confining the study to verbal instruction, the investigator sought to isolate the effects of speaking pace and task elaboration precision on learning. The file of resource materials included pamphlets and instruction sheets by the Minnesota State Pharmaceutical Association (1975), the National Institute on Drug Abuse (1984), and Roche Pharmaceuticals (1983).

The investigator set up a display of consumer-oriented books about prescription and nonprescription medications for use as supplementary resource materials by the study participants after the instructional program. An annotated bibliography of books displayed is included (Appendix A).

The instructional program incorporated principles of adult learning. The literature supports the fact that adult learners are goal directed and that they learn more readily through a problem-centered approach (Tarnow, 1979). The researcher viewed the older

learners in the study as consumers interested in increasing their capacity to effectively manage a drug regimen. In designing the instructional content of the program, the investigator selected diuretic medication information as a learning task that would be meaningful for the study participants. The selection of a learning task with practical applicability to the life tasks of older adults reflected a developing trend reported in the literature (Hartley, Harker, & Walsh, 1980) to avoid traditional experimental memory testing with older persons. Traditional memory tasks in experiments often use paired-associate learning requiring the learner to recall unrelated stimulus and response words (Hulicka, 1967).

Research Methodology

The effectiveness of the experimental instructional program designed to increase older learners' knowledge of diuretic medications was studied. The specific questions investigated were as follows:

1. Will older adults instructed at a slower rate of speaking earn higher adjusted mean scores on a test of diuretic medication knowledge than those instructed at a normal rate of speaking?

2. Will older adults instructed with precise task elaborations earn higher adjusted mean scores on a test of diuretic medication knowledge than those instructed with imprecise task elaborations?

3. Will an interaction effect due to treatment combinations of medication instructional rate and precision of task elaborations occur?

This study included two treatment variables. The two independent variables were pace (rate) of medication instruction and precision of task elaboration. Each independent variable had two treatment levels. The two levels of the variable pace of medication instruction were slow and normal. Precise and imprecise were the two levels of the variable precision of task elaboration. In this investigation pretest diuretic medication knowledge scores served as a covariate. The dependent variable of the study was posttest medication knowledge scores.

The combination treatment conditions dictated the use of a multigroup pretest-posttest design (Huck, Cormier, & Bounds, 1974). This design consists of random assigment of subjects to one of four treatment groups. The four treatment conditions were slow pace/precise elaboration (SP), slow pace/imprecise elaboration (SI), normal pace/precise elaboration (NP), and normal pace/imprecise elaboration (NI).

In research on instructional methods the control group is generally taught by the traditional or usual procedure (Ary, Jacobs, & Razavieh, 1979). Clients receiving medication instruction are typically taught at a normal rate of speaking. Under normal conditions clients instructed about their prescriptions are not given specific explanations or rationales concerning many aspects of self-administration of their medications. In the present study the normal pace/imprecise elaboration treatment group represented the traditional procedure of medication instruction and served as the control group.

Instrumentation

Instruments

The researcher developed the instruments used in the study. The instrumentation included the content of the diuretic medication instructional program, a medication history questionnaire, a medication knowledge pretest-posttest of recognition and a medication knowledge test of recall. A description of the instruments follows.

A literature search did not reveal any existing instruments to measure geriatric clients' knowledge of diuretic medications. The experimenter constructed precise and imprecise diuretic medication task elaboration scripts (Appendix B). The imprecise version of the diuretic instructions reflected the method of client health education traditionally used by health professionals. The imprecise instructions presented facts about diuretics to be learned by the older clients. The imprecise version contained no explanation of the significance or relevance of the factual content to be learned. The significance of the facts to be learned in the imprecise task elaboration version remained implicit. The precise version of the diuretic instructions explained the significance or relevance of the content to be learned. For example, the precise version clarifies why it is important to take the dose of a diuretic 6 hours before bedtime. Instead of having to generate their own explanations to clarify the arbitrary significance of facts about diuretics to be learned, those who received precise task elaborations had a mechanism to assist them toward an understanding of a prescribed drug regimen.

The instructional program was tape recorded in order to control the pace of the learning material. The pace of taped instructions was

normal (159 words per minute) or slow (100 words per minute). The tapes were prepared by blocking the precise and imprecise task elaboration scripts into 30-second intervals. The number of words in each interval depended on the pace of the instructional delivery. After repeated rehearsal trials to practice controlling the pace of the instruction to ensure a high rate of intra-instructor reliability, the investigator prepared four audiotapes to examine the effects of the SP, SI, NP and NI learning conditions.

The medication history questionnaire the investigator developed incorporated questions about variables from other research studies that had the potential to be predictor variables of older clients' medication knowledge levels (Appendix C). These variables included taking prescriptions written by two or more doctors and having prescriptions filled in two or more pharmacies, among others. Information about demographic variables with the potential to explain or predict clients' medication knowledge levels was included also. The medication history, in addition to eliciting information about the individual's regimen of prescription and nonprescription medications, includes the participant's report of medication instructions provided by health professionals in the past.

The investigator constructed one instrument to measure the subjects' medication knowledge at pretesting and posttesting. The rationale for not developing parallel forms of the instrument for pretesting and posttesting was the limited domains of knowledge being learned and tested. The 15-item test of recognition employed a structured multiple-choice answer format (Appendix D). The maximum possible score for an individual was 15 points and the minimum possible score was zero.

The investigator also developed a 15-item short-answer test of recall about diuretic medications (Appendix E). Again, the maximum score for a learner was 15 points and the minimum possible score was zero. The recall test served as a construct validation measure.

The opinion of experts established the content validity of the medication instructional program, the pretest-posttest, and the recall test of medication knowledge. Using a knowledge base about test-construction the investigator employed established principles and procedures in developing the test items (Chase, 1978; Mehrens & Lehmann, 1978).

The Kuder-Richardson 20 (K-R 20) was used to estimate the reliabilities of the pretest-posttest and the test of recall. The K-R 20 of the pretest was .86. The K-R 20 of the recall test was .75. The computations of the K-R 20 are described in Appendix F. The correlation between the pretest-posttest and the test of recall was .40.

Pilot Study

The methodology of this research included a pilot study. The purposes of the pilot study were to determine whether the instructional pace and task elaboration factors warranted investigation, to establish the feasibility of proposed data collection methods, and to establish the validity of the medication instructions and medication knowledge test. Twenty older adults who live independently in their own residences constituted the pilot sample. The 15-item

test of recognition was administered to all subjects individually at pretesting and posttesting. All pilot participants listened to the audiotape of normal imprecise diuretic medication instructions. After subjects listened to the taped instructions, the investigator administered the written posttest. No problems with the proposed data collection methods were uncovered.

Most pilot participants did not earn higher scores on the posttest of diuretic medication knowledge, thus indicating a potential for improvement under slow precise instructional conditions. An item analysis of the scores of the subjects in the pilot study led to refinement of the multiple-choice test of recognition. The investigator followed an established procedure for item analysis using item discrimination and item difficulty indices (Mehrens & Lehmann, 1978). The procedure involved computing the item difficulty index for each item first. The item difficulty index for the instrument ranged from .05 to .75. The investigator then computed the item discrimination index for each item in the instrument. The item discrimination index ranged from -.4 to .8. The results of the preliminary study indicated that the hypotheses and research methodology were tenable. After the preliminary study and subsequent instrument refinement, data collection began.

Sample

The setting of the study was an urban retirement community of 500 independent older adults in a Northeast Florida city with a

population of 550,000. The 500 residents of the retirement community live in efficiency, one-bedroom, or two-bedroom apartments, in one of three high-rise buildings within a one-block radius. The investigator obtained approval for conducting the study from the administrators of the retirement community.

Participation in the instructional program was open to all residents of the retirement community. The methods implemented to obtain a representative sample of the accessible population were listed in the delimitations section of Chapter I. The residence administrators informed the investigator retrospectively that some prior instructional offerings given by other health professionals had not been attended by a single resident of the community.

Thirty residents volunteered to participate in the program. Seven of the 30 volunteers informed the investigator prior to random assignment to treatment conditions that they could not stay for the entire instructional program. Three of the 30 volunteers did not meet the sample selection criteria requirements. A total of 20 subjects completed the instructional program. Of the total sample (N = 20), 19 were females and one was male. All subjects live independently in their own apartments.

Study participants met the sample selection criteria requirements of age, mental status orientation, ability to use the English language, and absence of severe uncorrected sensory deficits. All subjects were 62 years of age or older. Mental status orientation is an assessment of cognitive functioning. The Kahn-Goldfarb Mental Status Questionnaire (Appendix G) established an absence of cognitive

impairment (Burnside, 1981) in all participants. Subjects had to be able to read, write, speak, and understand English. The announcements of the instructional program included a reminder to residents to bring their eyeglasses. No participant in the investigation had an uncorrected speech, visual, or hearing deficit. A simple clinical assessment was conducted to rule out uncorrected sensory deficits. The procedure for ensuring that the subjects met the sample selection criteria included the following components. The investigator elicited a brief health history about speech, visual, and hearing impairments. Residents who denied having uncorrected speech problems and who demonstrated no problems when giving answers to the health history met the criterion for absence of speech deficits. After obtaining a health history of visual acuity, the investigator conducted a gross assessment of near vision. All participants brought their glasses and demonstrated the ability to read standard pica print without assistance. Understanding the investigator's spoken words from a distance of 1 foot and 5 feet comprised the clinical test of auditory function. None of the participants required the use of an assistive hearing device. Twenty residents meeting the sample selection criteria constituted the study sample.

Date Collection

Data collection began on October 11 and ended November 7, 1984. Data collection took place in several conference rooms of one of the high-rise residences. These rooms are frequently used by residents for various activities. The researcher considered a familiar

environment to be an important aspect of promoting the learners' comfort with the data collection procedures.

Prior to beginning data collection the investigator conducted an orientation session for three assistants. The data collection assistants were provided with verbal and written instructions about the goal of the study and the procedures for data collecting. The sequence of the data collection procedures was outlined and time was allowed for questions. Assistants received specific assignments and assisted the investigator as directed.

After the orientation session the assistants helped the investigator complete the final equipment and facility preparations. Some activities representative of the final preparations included preparing the refreshments, setting up the book display, arranging comfortable seating and lighting in the treatment areas, and rechecking the tape recorders and audiotapes. Extra duplicate tapes and equivalent model tape recorders were available for use in the event of equipment failure.

The investigator set up an area to greet the residents and to conduct the appraisal of sample selection criteria eligibility. Residents satisfying the sample selection criteria received a participant number. Two assistants helped the screened participants get settled while the remaining individuals were screened by the investigator. One assistant aided the experimenter in the random assignment to treatment conditions procedure.

The investigator began the instructional offering with an explanation that she was a doctoral candidate and a registered nurse,

and introduced the data collection assistants. After thanking the participants for their involvement, a brief synopsis of the problem of unintentional drug misuse by older persons and the relevance of the issue for them was provided. The study participants were then given an explanation of each of the components of the instructional program.

The investigator, with assistance, distributed the written informed consent forms (Appendix H). Even after receiving an explanation of the rationale of consent as a human subjects' protection measure, many participants had questions and displayed discomfort with signing the form. The researcher inferred that the residents perceived they might have been signing something unknowingly. Although anonymity and confidentiality of test results were guaranteed, the written informed consent procedure acted to decrease the atmosphere of initial trust between experimenter and subjects. Assistants helped to allay anxiety about the informed consent and served as witnesses to subjects' signatures.

Data collection began with a pretest of subjects' knowledge of diuretic medications. Because research has demonstrated that older adults' learning performance is facilitated when no time constraints are placed on responding (Knox, 1977), the researcher allowed the participants to complete the pretest at their own pace.

Announcement of assignment to treatment condition followed pretesting. The subjects then took a refreshment break. The refreshment break served two purposes. First, it followed research recommendations for promoting effective learning with older adults (Knox, 1977). Second, it provided an interval between testing

procedures with the aim of decreasing the likelihood of subjects responding to the posttest based on pretest answers rather than on information learned during the treatment.

The researcher and the assistants directed the subjects to the individual treatment areas. Subjects completed the medication history questionnaire. Each treatment group facilitator then started the respective audiotape, adjusting the volume as needed, before commencing the instructional program. After listening to the audiotape corresponding to the assigned learning condition, subjects completed the short-answer recall validation measure. Participants then completed the posttest of diuretic medication knowledge. Facilitators distributed prepared packets of resource materials to the subjects. For ethical reasons, the investigator offered the slow precise learning condition to all subjects not randomly assigned to that group.

Following the instructional offering an assistant manned the book display. Assistants referred clients with questions about medications to the investigator. Individual medication counseling was provided to any participant desiring information after the instructional program.

Research Design

The experimenter used a multigroup pretest-posttest design to investigate the research questions. The design consisted of random assignment of subjects to one of four learning conditions. The four treatment conditions were slow pace/precise elaboration (SP), slow

pace/imprecise elaboration (SI), normal pace/precise elaboration (NP), and normal pace/imprecise elaboration (NI). The random assignment procedure began with assigning persons satisfying the sample selection criteria with a participant number. Next, a random numbers table was used to assign participants to treatment conditions. Based upon order of occurrence in the random numbers table the first five numbers from 1 to 20 constituted group one; the second five, group two; the third five, group three; and the last five, group four.

After random assignment of subjects, the design required collection of pretest data from the participants. In this study pretest scores served as a covariate. A pretest was necessary to determine subjects' initial differences in levels of diuretic medication knowledge.

Following pretest data collection in a multigroup pretest-posttest design, each group received a different learning treatment exposure. The final component of the design involved posttest data collection from each subject.

The multigroup pretest-posttest design (Huck, Cormier, & Bounds, 1974) can be diagrammed as follows:

	Pretest		Posttest
R	0	X_1	0
R	0	X_2	0
R	0	X_3	0
R	0	X_4	0

Design Validity

The multigroup pretest-posttest design is an extension of the classic experimental pretest-posttest control group design. This

design controls most of the threats to internal validity. Random assignment, a measure to assure statistical equivalence between the treatment groups prior to the experimentation, is an important strength of this design. Random assignment exercises statistical control of intersubject differences. Subject mortality, one threat to internal validity not controlled by the multigroup design, did not occur in this study.

True experimental designs do not control all the threats to external validity. Without random selection from the experimentally accessible population, the researcher is limited in generalizing the study findings to all older learners. Pretest and posttest sensitization were potential threats to external validity. The posttest medication knowledge test may have provided cues that facilitated recall of diuretic information or medication concepts. Because some subjects voiced hesitancy to complete the same form of the posttest, the researcher cannot guarantee that the pretest did not decrease the subjects' sensitivity to the treatment. Another potential threat to external validity may have been the Disruption Effect (Huck, Cormier, & Bounds, 1974). Subjects demonstrated variable degrees of adapting to the data collection procedures, especially the testing components. If the older subjects were more familiar with multiple-choice testing, the results of the diuretic medication instructional program might have differed.

Data Analysis

The hypotheses tested in the statistical analysis were as follows:

1. Older adults instructed at a slower rate of speaking will earn higher adjusted mean scores on a test of medication knowledge than those instructed at a normal rate of speaking.

2. Older adults instructed with precise task elaborations will earn higher adjusted mean scores on a test of medication knowledge than those instructed with imprecise task elaborations.

3. No interaction effect due to treatment combinations of medication instructional rate and precision of task elaboration will occur.

The statistical significance of observed mean differences was tested at an alpha level of .05.

Analysis of covariance is a method used to analyze differences between experimental groups after taking into account any initial differences between treatment groups on the pretest. Analysis of covariance is a statistical method of controlling extraneous variables that confound the relationship between the independent and the dependent variable (Ary, Jacobs, & Razavieh, 1979). Because medication knowledge scores on the posttest might have been, in part, a function of initial medication knowledge as well as a function of the diuretic instructional program, the investigator employed a two-way factorial analysis of covariance. In this research, initial level of medication knowledge was the covariate, rate of medication instructional delivery and precision of task elaboration were the two independent variables, each with two levels, and the posttest score of diuretic medication knowledge was the dependent variable.

The two-way factorial design can be diagrammed as follows:

Task Elaboration Precision (X_2)	Pace of Medication Instruction (X_1) Normal	Slow
Imprecise	1	3
Precise	2	4

CHAPTER IV

PRESENTATION OF RESULTS

The purpose of this study was to determine whether slowing the pace of medication instruction delivery, or increasing the preciseness of task explanations, or an interaction of the two factors could facilitate learning for noninstitutionalized geriatric clients. The investigator developed and tested an instructional program of diuretic medication health teaching to examine the effects of instructional pace and task elaboration precision on older adults' learning. The researcher tested older adults living independently in a retirement community and responsible for their own health and medication management. The four treatment conditions were slow pace/precise elaboration, slow pace/imprecise elaboration, normal pace/precise elaboration and normal pace/imprecise elaboration. The normal pace/imprecise elaboration learning condition served as a control group.

Experimental results were analyzed with a two-way analysis of covariance. In the study the dependent variable was posttest scores on a multiple-choice examination of diuretic medication knowledge. Pretest scores, on the same instrument, served as a covariate. The independent variables were pace of medication instructional delivery and precision of task elaboration.

After controlling for the initial level of pretest scores of medication knowledge, the following hypotheses were tested:

1. Older adults instructed at a slower rate of speaking will earn higher adjusted mean scores on a test of medication knowledge than those instructed at a normal rate of speaking.

2. Older adults instructed with precise task elaborations will earn higher adjusted mean scores on a test of medication knowledge than those instructed with imprecise task elaborations.

3. No interaction effect due to treatment combinations of medication instructional rate and precision of task elaborations will occur.

Summary of Descriptive Data

The total experimental population included 20 older learners. Out of the sample population 19 were white females and 1 was a white male. The ages of subjects ranged from 62 to 88 years. Four subjects ranged in age from 62-68 years, seven subjects ranged from 71-78, and nine subjects were 80-88 years old. Summary age descriptive data are presented in Table 1. The overall marital status of the population was 20% divorced and 80% widowed. The marital status data by treatment group are presented in Table 2. Fifty percent of the population had an educational background of 4-11 years of schooling, 25% had completed 12 years and 25% had attended school for more than 12 years. Summary data about years of educational background are presented in percentage form in Table 3. The distribution of reading habits included 90% of the population reporting daily reading, 5% stating they read weekly, and 5%

reporting they read monthly. The typical resident in the study can be characterized as a Caucasian female, 77 years old, taking two prescriptions.

Table 1

Summary Age Descriptive Data by Treatment Group

Group	N	Mean Age	Age Range
1 (NI)	5	76.2	63-87
2 (NP)	5	81.2	74-88
3 (SI)	5	76.0	62-88
4 (SP)	5	75.4	62-86

Table 2

Summary Marital Status Descriptive Data by Group

Group	N	% Widowed	% Divorced
1 (NI)	5	60	40
2 (NP)	5	80	20
3 (SI)	5	80	20
4 (SP)	5	100	0

Table 3

Summary Years of Education Descriptive Data by Group

Group	N	%4-11	%12	%12+
1 (NI)	5	60	0	40
2 (NP)	5	20	60	20
3 (SI)	5	40	20	40
4 (SP)	5	80	20	0

None of the variables identified in the literature as potential explanatory or predictor variables of geriatric clients' medication knowledge levels were statistically significant in this sample population. These variables included taking prescriptions written by two or more doctors and having prescriptions filled in two or more pharmacies, among others.

Statistical Analysis

The researcher conducted a two-way analysis of covariance on the dependent measure of scores on a test of diuretic medication knowledge. The two factors analyzed were spoken pace of medication instruction and precision of task elaboration. The two levels of the factor medication pace were slow and normal. The two levels of the factor task elaboration precision were precise and imprecise. The pretest and posttest means and standard deviations found in analysis of the four treatment conditions are presented in Table 4.

Table 4

Means and Standard Deviations of Pretest and Posttest Medication Covariate Scores

Group	Mean	Standard Deviation	N
Pretest			
Group 1 (NI)	5.6	2.19	5
Group 2 (NP)	6.4	3.36	5
Group 3 (SI)	5.2	2.28	5
Group 4 (SP)	4.2	1.78	5
Posttest			
Group 1 (NI)	5.2	2.28	5
Group 2 (NP)	7.4	2.07	5
Group 3 (SI)	7.4	3.64	5
Group 4 (SP)	6.4	1.81	5

Data were analyzed within the framework of a general linear model, specified as Posttest = B_1 (Pretest) + B_2 (Pace) + B_3 (Precision) + B_4 (Pretest x Pace) + B_5 (Pretest x Precision) + B_6 (Pretest x Pace x Precision). The B's are the regression coefficients derived for the effects in the general linear model. The analysis of covariance required an initial step of testing the assumption of the homogeneity of slopes for the regression of the dependent variable on the covariate. This assumption was tested using the three interactions: Pretest x Pace, Pretest x Precision, and Pretest x Pace x Precision. Because of the small sample size, the reduced power of interaction tests, and the fact that the researcher hoped to find no significant effects for this test, an alpha level of .10 was used. For the Pretest x Pace interaction, the analysis found that $F = .02$, $p = .88$. Thus, the Pretest x Pace interaction was nonsignificant. However, in testing the Pretest x Precision interaction, the analysis yielded an F of 6.53, $p = .025$, which was statistically significant. Furthermore, the

three-way interaction of Pretest x Pace x Precision yielded an F of 3.66, p. = .08, which was also significant at the alpha level of .10. Thus, the hypothesis of homogeneity of regression slopes was rejected. A three-way significant Covariate x Treatment x Treatment interaction precluded straightforward interpretation of other main effects or interactions in the model.

To clarify the nature of this interaction, the researcher calculated the regression slopes and intercept estimates for each of the four treatment groups and plotted separate regression lines of posttest on pretest. Figure 1 depicts regressions of posttest on pretest scores for groups receiving imprecise levels of instruction. Figure 2 depicts regressions of posttest on pretest scores for groups receiving precise levels of instruction. The three-way interaction indicates that slopes for the treatment groups receiving imprecise instruction (1 and 3) vary from each other in a way that is significantly different from the way that the slopes for the treatment groups receiving precise instruction (2 and 4) vary.

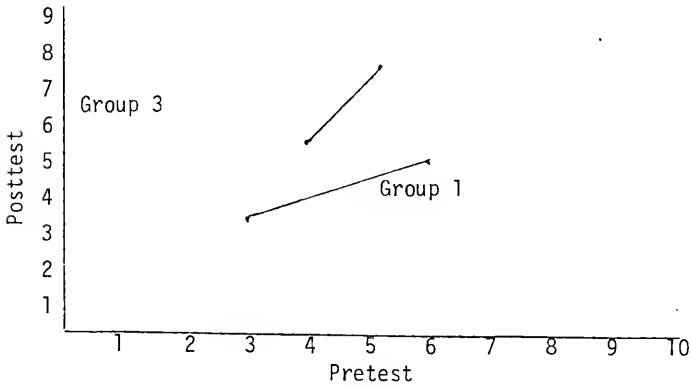

Figure 1. Regression of Posttest on Pretest Scores at Imprecise Levels

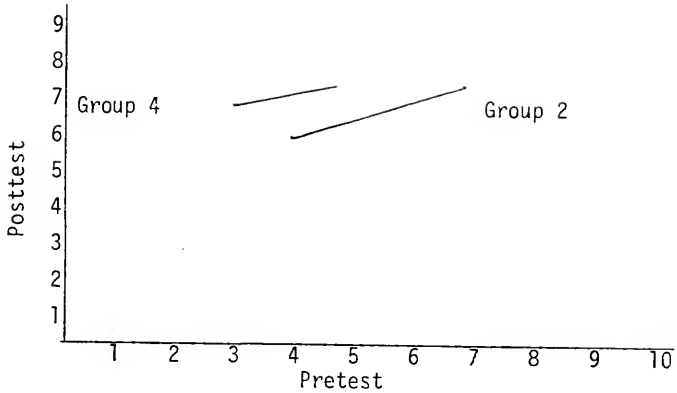

Figure 2. Regression of Posttest on Pretest Scores at Precise Instructional Levels

To simplify the nature of the Covariate x Treatment x Treatment interaction the investigator ran a reduced model dropping the three-way interaction and the non-significant Pretest x Pace interaction. The results of the reduced model again yielded a significant Pretest x Precision interaction with $F = 4.69$, $p = .048$. The Covariate x Treatment interaction of Pretest x Precision is depicted in Table 5.

Table 5

GLM ANCOVA Summary Table

Source	df	SS	F	p
Pretest (Covariate)	1	62.11	23.07	.0003
Pace	1	7.90	2.94	.1087
Precision	1	14.89	5.53	.0339
Pace x Precision	1	8.16	3.03	.1036
Pretest x Precision	1	12.62	4.69	.0482

N = 20

When a significant interaction is found between a covariate and a treatment, the researcher may elect to pursue investigation of the interaction by calculating the regions of significance. One possible approach to the establishment of regions of significance is the Johnson-Neyman technique (Pedhazur, 1982). This procedure establishes the values of the covariate for which the conditional means for treatment groups are not significantly different. Before proceeding with this fairly complex technique, a reexamination of the residual data plots led the researcher to consider that the Covariate x Treatment interactions might be due to the presence of one extreme outlier. This individual, subject number 6, in Group 3, was different from her peer subjects in that she earned the highest scores of the entire sample on both the pretest and the posttest.

To examine the effect of this outlier the investigator reran the data analysis using a sample of N=19. The results of this analysis are presented in Table 6. In testing Pretest x Pace the analysis yielded $F = .07$, $p = .7962$. The Pretest x Precision test yielded $F = 2.37$, $p = .1497$. Thus, at the .05 level of significance these findings favored acceptance of the assumption of the homogeneity of slopes for the regression of the dependent variable on the covariate.

Once it was established that no Covariate x Treatment interaction existed, the researcher proceeded to analyze the data with the analysis of covariance. Table 7 depicts the ANCOVA summary table for $N = 19$. The three hypotheses stated at the beginning of this chapter were tested. At the 95% confidence level with a critical F of 4.6 and 1,14

degrees of freedom, the calculated F of 1.63, p = .22 was non-significant for hypotheses 1 and 2. The interpretation of these results meant that the levels of pace and precision were equally effective. The researcher concluded that research hypotheses 1 and 2 were not statistically significant at the .05 alpha level. Thus, older adults instructed at a slower rate of speaking did not earn higher adjusted mean scores on a test of medication knowledge than those instructed at a normal rate of speaking. Older adults instructed with precise elaborations did not earn higher adjusted mean scores on a test of medication knowledge than those instructed with imprecise task elaborations. Testing hypothesis 3 revealed no interaction effect due to treatment combinations of medication instructional pace and precision of task elaborations. At the 95% confidence level with a critical F of 4.6 and 1,14 degrees of freedom, the calculated F of .70, p = .4154 was non-significant. Table 7 also depicts those results.

Table 6

GLM Model ANCOVA Summary Table With Outlier Removed

Source	df	SS	F	p
Pretest (Covariate)	1	33.45	11.58	.0052
Pace	1	1.60	.55	.4708
Precision	1	10.48	3.63	.0809
Pace x Precision	1	5.04	1.75	.2107
Pretest x Precision	1	6.84	2.37	.1497
Pretest x Pace	1	.20	.07	.7962

N = 19

Table 7

ANCOVA Summary Table of Instructional Pace and Task Precision

Source	df	SS	f	p
Pretest (Covariate)	1	36.45	12.30	.0035
Pace	1	4.84	1.63	.2219
Precision	1	4.82	1.63	.2228
Pace x Precision	1	2.08	.70	.4154

The instructional factors of a slow spoken pace and precise task explanations, hypothesized to be effective in promoting geriatric clients' learning, were not substantiated in this study. No statistically significant differences were found between a slow and a normal instructional pace or between a precise level of task elaboration and an imprecise level of task elaboration. The researcher found no interaction effect due to treatment combinations of medication instructional pace and task precision.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The elderly require more medications for health maintenance, ingest more prescription and nonprescription drugs, and suffer more adverse drug reactions and interactions than the young. Research documents an increasing incidence of unintentional drug misuse by older Americans. Health professionals are accountable for promoting safe and effective medication-taking practices for the elderly. In order to implement the role of health educator with geriatric clients, health professionals need knowledge about instructional strategies that are effective in assisting older persons to manage their drug regimens. The researcher undertook this investigation to contribute to advancement of the knowledge base about instructional factors that promote learning by geriatric clients. Two instructional factors, pace of medication instructional delivery and precision of task elaborations, were investigated.

The purpose of this study was to determine whether slowing the pace of medication instruction delivery, or increasing the preciseness of task explanations, or a combination of the two could facilitate learning for noninstitutionalized geriatric clients. The investigator developed and tested an instructional program of diuretic

medication health teaching to examine the effects of verbal instructional pace and task elaboration precision on older adults' learning. The researcher tested the instructional factors through an experimental multigroup pretest-posttest design. Participants were randomly assigned to one of four treatment groups: slow pace/precise elaboration, slow pace/imprecise elaboration, normal pace/precise elaboration, and normal pace/imprecise elaboration. The normal pace/imprecise elaboration served as a control group representing the usual client health teaching procedure. The dependent variable was posttest scores on a multiple-choice examination of diuretic medication knowledge that the investigator developed. Pretest scores, on the same instrument, served as a covariate. The independent variables were pace of medication instructional delivery and precision of task elaboration. Statistical analysis procedures included a two-way analysis of covariance to test the research hypotheses.

The treatment setting was an urban retirement community of 500 independent older adults. The participants live alone and assume total responsibility for their own health and medication management. Old-old subjects, with a mean age of 77 years, constituted the sample population. The sample size was limited, in part, due to sample selection criteria requirements of age, mental status orientation, ability to use the English language, and absence of severe uncorrected sensory deficits. Twenty Caucasian subjects were the population of the study. The total sample population contained 1 male and 19 females. Demographic data collected on

study participants revealed a heterogeneous sample population in terms of age, years of schooling, and number of medications. None of the variables identified in the literature as potential explanatory or predictor variables of geriatric clients' medication knowledge levels were statistically significant in the study population. These variables included taking prescriptions written by two or more health care providers and having prescriptions filled in two or more pharmacies, among others.

In initial data analysis procedures a Covariate x Treatment x Treatment interaction resulted. After a reexamination of the residual plots of the data, the researcher inferred that this effect might be due to the presence of an extreme outlier. The subject, identified as an outlier, scored higher than any other participant on both the pretest and the posttest. Analysis of covariance was employed dropping this individual from the sample. The final data analysis of $N = 19$ revealed no Covariate x Treatment or higher order interaction.

Data collected were used in testing three hypotheses. The hypothesis that older adults instructed at a slower rate of speaking would earn higher adjusted mean scores on a test of medication knowledge than those instructed at a normal rate of speaking was not retained. The pace effect was not significant at the .05 level with $F = 4.6$, $df = 1,14$, $p = .22$. The hypothesis that older adults instructed with precise task elaborations would earn higher adjusted mean scores on a test of medication knowledge than those instructed with imprecise task elaborations was not

retained. No significant effect of precision was found at the .05 level with $F = 4.6$, $df = 1,14$, $p = .22$. There was no significant interaction effect due to treatment combinations of medication instructional pace and precision of task elaborations. The interaction of pace and precision was not significant at the .05 level with $F = .70$, $df = 1,14$, $p = .4154$.

Conclusions

This investigation was initiated to test the effectiveness of slow versus normal instructional pace and precise versus imprecise task elaboration. The aim of the research was to add to the sparse literature about instructional conditions that are effective with older learners. Because gerontological research is a new field of study, the body of knowledge for building sound conceptual and theoretical frameworks is small. The link between gerontological instructional research and application to the practice of client health education is an incipient one.

After controlling for the initial level of pretest scores of diuretic medication knowledge, the investigator tested the following hypotheses:

1. Older adults instructed at a slower rate of speaking will earn higher adjusted mean scores on a test of medication knowledge than those instructed at a normal rate of speaking.

2. Older adults instructed with precise task elaborations will earn higher adjusted mean scores on a test of medication knowledge than those instructed with imprecise elaborations.

3. No interaction effect due to treatment combinations of medication instructional rate and precision of task elaboration will occur.

Within the constraints of this study, the directional hypotheses 1 and 2 were not retained, while hypothesis 3 was retained. In other words, no treatment effects due to instructional pace, task elaboration precision, or a combination of the two were statistically significant. This study did not substantiate the findings of Kim and Grier (1981) that instructing older clients at a slower speed is an important variable in an individual's ability to remember information about medications. The value of precise task elaborations for improving children's learning processes (Bransford et al., 1982) did not receive support in this study of older adult learners. This investigator could not conclude that a slower than normal pace or precise task explanations are effective instructional factors in promoting geriatric clients' learning.

A visual examination of the adjusted posttest means (N = 19) revealed a fairly large difference between the control or normal pace/imprecise elaboration group and the slow pace/precise elaboration group. The researcher had inferred that those receiving the traditional or control medication instruction treatment would earn the lowest mean scores of any learning condition. She had also inferred that those receiving instructions at a slower than normal rate with precise explanations would earn the highest adjusted mean score of any of the four treatment conditions. The adjusted posttest score mean for the NI group was 4.94 and 7.04 for the SP group. On a 15-point grading scale the range of posttest scores was

2 to 11. Although the magnitude of the differences was not statistically significant, there is a reasonable difference between the means. The four treatment groups differ from each other incrementally in exactly the way the investigator had predicted. A trend in the observed means supports the inference of the effectiveness of a slow instructional pace and precise task elaboration. Table 8 depicts the adjusted means of the four learning conditions.

Table 8

Adjusted Posttest Means

Group	N	Mean
Group 1 (NI)	4	4.94
Group 2 (NP)	5	6.63
Group 3 (SI)	5	6.70
Group 4 (SP)	5	7.04

The researcher recognizes the possibility that due to a small sample size a Type II error may have been made. Stated another way, this experiment lacked the statistical power to detect significant differences between treatment conditions. Other potential sources of variability contributing to the non-significant statistical findings were the reliability of the measuring instrument and the sample heterogeneity.

Recommendations

Pace of instructional delivery and task elaboration precision are variables that warrant further investigation. A slower pace of instruction, as an effective learning strategy, has had limited research verification and requires replication to confirm or rule

out its value. Task elaboration precision, a learning factor that has received substantial research support in the field of educational psychology with children as subjects, needs further investigation using an elderly population.

Several contributing factors lead the researcher to recommend replication of a like or similar investigation, in spite of the lack of significant statistical findings. Health professionals as researchers are still responsible for delineating instructional factors or strategies that are effective in reducing the incidence of drug misuse in the elderly population due to inadequate medication knowledge. The identification of instructional strategies that promote a learner's understanding of a drug regimen is essential. Older adults cannot be expected to be active partners with health professionals in safe management of their medication regimens if they are only taught memory aids to decrease medication mistakes. The vast majority of older noninstitutionalized persons can be assisted to develop the knowledge and skills of safe medication practices if research studies can lead to the identification of effective instructional strategies. Diuretics are one of the most widely prescribed classes of medication for the older population. Because measurement instruments tested on the elderly population are not readily available, the investigator would recommend replications using the existing instrument until its measuring scale can be refined.

The diversity of the elderly population contributes to the methodological challenges of developing reliable instruments and in

establishing control over extraneous variables. The variable nature of the target population of older persons and the heterogeneity of the accessible sample population in this study require that replication studies exert more control over intersubject difference. To increase the equivalence among treatment groups in replication experiments, it is recommended that researchers repeat the use of random assignment and analysis of covariance. An additional control measure could include randomized matching of subjects based on pretest scores or any other extraneous variables expected to affect the dependent variables. Greater control could also be achieved by selecting samples that are as homogeneous as possible on age and educational background.

The researcher recommends replication of the investigation using a larger sample population. Investigating pace and task elaboration precision should first be replicated with a young-old population. The pilot study conducted on a young-old sample indicated that the pace and precision variables warranted further investigation. Using a young-old sample initially would allow investigators to control methodological problems that may be unique to the old-old population. If significant findings are obtained, further research studies with the old-old would then be in order.

This study left unanswered why some subjects reacted to the pretest-posttest procedure. Additional research is indicated to determine if this reactivity is non-existent when alternate instrument forms are used. Employing a Solomon Three-Group research

design with one treatment group not being pretested would allow an investigator to observe the effect of pretest sensitization.

Other primary factors need to be taken into consideration in replication of similar studies. The setting of the experiment is a crucial element in experiments with older people. As in this study, the researcher must attend to the sensory impairments of the subjects, the setting should optimally be a familiar environment, and the time of the instruction should be acceptable to the clients. The response of the participants in this study to written informed consent leads the researcher to caution other investigators about this factor. The question remains unanswered whether older subjects who volunteer their participation should be required to provide written consent.

The researcher recommends investigation of other measures to test knowledge of medications. The study sample, not unlike the target elderly population, have limited test-taking experience. The investigator is led to question whether traditional written test formats, used in isolation, can validly explain or predict medication knowledge levels of older learners. This area could be investigated by identifying learning tasks in the cognitive, psychomotor, and affective domains. Attention to learning style preference and motivation are other areas for investigation. This research study did not address individual differences in learning style preference. Concepts and theories about the ways individuals learn need to be tested with the older learner population.

In conclusion, the researcher suggests that a single study in the new field of gerontological instructional research should not be

regarded as definitive in the presence of either significant or non-significant findings. Interdisciplinary collaboration of researchers is needed to identify instructional strategies that are consistently effective with older learners in promoting learning.

APPENDIX A

ANNOTATED BIBLIOGRAPHY

ANNOTATED BIBLIOGRAPHY

Benowicz, R. J. (1977). Non-prescription drugs and their side effects. New York: Grosset & Dunlap.

Describes the appropriate use and potential misuse of various drug classes. Focuses on the careful selection and ingestion of non-prescription drugs.

Chilnick, L. O. (Ed.). (1982). The pill book (2nd ed.). New York: Bantam.

Contains alphabetical profiles of 700 drugs commonly prescribed. Presents generic and brand names. Color photos of all drugs are included. A glossary of drug-related words is also included.

Evans, W. O., & Cole, J. O. (1978). Your medicine chest: A consumer's guide to prescription and non-prescription drugs. Boston: Little, Brown.

Basic principles of pharmacology are explained. Basic information is provided about how medicines work and what drug classifications mean.

Gossel, T. A., & Stansloski, D. W. (Eds.). (1978). Prescription drugs. New York: Crown Publishers.

Contains drug profiles of frequently prescribed medications. Emphasizes the correct way to take medications safely. Includes information on how to communicate with health professionals.

Graedon, J. (1976). The people's pharmacy. New York: Avon.

Introduces the topic of consumerism regarding medications. Gives basic information on the potential hazards of prescription and non-prescription drugs. One chapter explains that self-treatment is not a substitute for medication therapy.

Graedon, J. (1980). The people's pharmacy 2. New York: Avon.

Presents information on drug-drug and drug-food interactions. Contains chapters addressing the needs of women, children, and older people. This is a self-help guidebook promoting consumerism.

Griffith, H. W. (1983). Complete guide to prescription and non-prescription drugs. Tuscon: HP Books.

A large print book explaining the practice of taking medications safely. Developmentally appropriate for older adults. Contains alphabetical drug charts.

Parrish, P. (1977). The doctor's and patient's handbook of medicines and drugs. New York: Alfred A. Knopf.

Presents 1500 non-prescription and prescription drugs according to their action, dosage, side effects, and interactions. This is written at a high school reading level.

Tanner, C. (1981). The prudent use of medicines. Alexandria, Va.: Time-Life Books.

Describes how drugs are manufactured and how they work in the body. This is a reference book about medicine--it is not a consumer's guidebook.

Wigdner, H. N. (1979). Wigdner's guide to over-the-counter drugs. New York: St. Martin's Press.

A consumer guide written by a physician. Non-prescription drugs are discussed in terms of effectiveness, cost, and safety.

APPENDIX B

PRECISE AND IMPRECISE TASK ELABORATION SCRIPTS

PRECISE ELABORATION

In order to take your diuretic medicine correctly you need to know its purpose, the schedule of when to take it, any side effects you can recognize and when to report them, and some special instructions, including what to do if you forget to take your medicine. By learning these facts you can avoid mistakes that other older persons commonly make when taking prescribed medicines. The goal of this medication instruction is to assist you to become an active partner with health professionals in the proper use of your diuretic medicine.

One common medication mistake older people make is drug omission or failure to take a drug as prescribed. Failing to take a drug may be due to forgetting, running out of a prescription, or to a deliberate choice not to take the medicine. Lack of knowledge about medicines can also lead to mistakes. Taking the wrong dose of a drug or taking it at the wrong time is a problem. Most medication mistakes involve not taking enough of a prescribed medicine. Lack of knowledge may be caused by unclear medication instructions by a doctor or nurse, or a misunderstanding of the instructions or prescription label. Not understanding the benefits of a diuretic or the precautions to take with these drugs may lead to mistakes. Problems with seeing and hearing can cause older persons to make medication mistakes.

Taking medications that are not prescribed is another mistake. This is sometimes due to exchanging medications with a friend or family member who seems to have the same medical complaint. Most of the time older persons do not know a mistake is being made.

Knowledge about a diuretic's purpose, schedule, side effects, handling a forgotten dose and other special instructions may help people make fewer mistakes.

Diuretics are commonly called water pills. Diuretics stimulate the kidneys to produce more urine. The urine gets rid of excess water and salt from the body. Diuretics prevent or correct body tissues from retaining unneeded fluid.

Diuretics are used to treat the retention of fluid in the body caused by various illnesses, such as heart and kidney disease. As diuretics remove the extra fluid through the urine, the volume of fluid in the body is reduced.

Diuretics are also used to treat high blood pressure. As diuretics cause the blood vessels to get larger the space available for blood to circulate is increased. The combination of a decreased fluid volume and expanded space for blood to flow leads to a blood pressure in the normal range.

Your doctor has prescribed how often you are to take the diuretic. At first you may urinate (pass your water) more frequently and in larger amounts. Unless your doctor has given different instructions if you are to take one dose of medicine a day take it in the morning after breakfast. If you are to take more than one dose a day take the last dose 6 hours before bedtime. The reason

it is best to take the diuretic earlier in the day is so that you will pass your urine while you are awake and not have to get up during the night to go to the bathroom.

Try to take the diuretic at the same time(s) everyday. There are two reasons for this. First, for the medicine to work properly, there needs to be a constant level of the diuretic in your body. Secondly, the habit of taking your medicine at the same time each day will help you not to forget a dose.

It is important for you to find out from your doctor what to do if you forget to take your medicine. There are different kinds of diuretics. With some kinds it is necessary to take the missed dose as soon as possible. With other diuretics it is best to skip the missed dose. No double doses should be taken without your doctor's approval. It is important not to take double doses of a diuretic or more than has been prescribed because it can cause you to lose too much body fluid. The older you get the easier it is for you to lose body fluid.

Many people never have any unwanted effects from their medications. Sometimes diuretics have undesirable effects called side effects. It is important to ask your doctor how you should expect to feel when taking the diuretic and what you can do if a common side effect does occur. Don't stop taking the medicine or change the dosage without your doctor's advice. There are several reasons for this. If you think your medicine is causing a problem you doctor can tell you if the effect you feel is due to the medicine or not. Also, your doctor may be able to adjust your dosage, prescribe a different drug

without the side effects, or at least reassure you that the benefits of the drug are greater than the discomfort of the side effects.

When taking a diuretic you may need to eat foods rich in potassium or take a prescribed potassium supplement. Potassium is a mineral provided by the food you eat that the body needs and normally stores. For the body to function correctly salt and potassium must be kept in a proper balance. Most diuretics cause the body to lose potassium. When the level of potassium is low it must be replaced either by potassium rich foods or a prescribed potassium supplement.

Food rich in potassium includes fresh oranges, bananas, tomatoes and apricots. Your body has warning signs to let you know the level of potassium is too low. If you become unusually thirsty, excessively weak and tired, or if you develop muscle cramps in your legs, call your doctor right away.

Some diuretics prevent the loss of potassium. It is important to know whether or not you require potassium replacement.

One possible side effect of diuretics is dehydration. Dehydration is a fluid imbalance caused by the body losing water, salt, and possibly potassium. Don't decrease the amount of fluid you drink in order to stop urinating (passing your water) so frequently because you can get dehydrated. If you are dehydrated your urine may look a darker yellow or brown and you may be very thirsty. Follow your doctor's advice for correcting dehydration.

Diuretics may cause a decreased blood pressure leading to a feeling of dizziness. You may feel dizzy or lightheaded, especially when you get up from a lying position because the body takes several

minutes to adjust your blood pressure to a normal level. To prevent a feeling of dizziness associated with lowered blood pressure change positions slowly. Get out of bed slowly, placing your feet on the floor and pumping the leg muscles a few times before getting up. Let your doctor know about the dizziness so he can adjust your medication if needed. Drinking alcoholic beverages while taking a diuretic can make the dizziness worse by lowering the blood pressure too much. Dizziness may also occur if you stand for long periods, exercise in hot weather or take hot showers or baths.

Diuretics make some people more sensitive to sunlight. To prevent sunburn try to avoid too much sun or use of a sunlamp until you see how your skin reacts. Notify your doctor if your skin becomes more sensitive to sunlight.

Do not stop taking your diuretics because you feel better, unless your doctor tells you to. Diuretics are usually prescribed for medical conditions that cannot be cured, but that can only be controlled. For example, when a diuretic is prescribed to control high blood pressure, the high blood pressure will return if the person stops the medicine.

Do not stop the diuretic if it has some of the side effects you have learned about. In most cases your doctor can prescribe other drugs or combinations of drugs that can do just as good a job without the unpleasant side effects.

Check with your doctor and nurse if you have questions or concerns. Remember, in order to get the most benefit from your medicine, you must be responsible for taking your diuretics correctly.

IMPRECISE ELABORATION

In order to take your diuretic medicine correctly you need to know its purpose, the schdule of when to take it, any side effects you can recognize and when to report them, and some special instructions including what to do if you forget to take your medicine. By learning these facts you can avoid mistakes that other older persons commonly make when taking prescribed medicines. The goal of this medication instruction is to assist you to become an active partner with health professionals in the proper use of your diuretic medicine.

A common medication mistake older people make is drug omission or failure to take a drug. Lack of knowledge about medicines can also lead to mistakes. Taking the wrong dose of a drug or taking it at the wrong time is a problem. Most mistakes involve not taking enough of a prescribed medicine. Not understanding a doctor or nurse's instructions or the prescription label causes persons to take diuretics incorrectly. Taking medications that are not prescribed is another mistake.

Diuretics are commonly called water pills. Diuretics act on the kidneys to increase the urine output of body water and salt.

Diuretics are used to treat high blood pressure and fluid retention that is caused by a number of medical conditions.

Your doctor has prescribed how often you are to take the diuretic. At first, you may urinate (pass your water) more

frequently and in larger amounts. Unless your doctor has given different instructions if you are to take one dose of medicine a day, take it in the morning after breakfast. If you are to take more than one dose a day, take the last dose 6 hours before bedtime.

Try to take the diuretic medicine at the same time(s) every day.

It is important for you to find out from your doctor what to do if you forget to take your medicine. Do not take a double dose of your diuretic without your doctor's permission. Never take more of a diuretic than your doctor has prescribed.

Many people never have any unwanted effects from their medicines. Sometimes diuretics have undesirable effects called side effects. It is important to ask your doctor how you should expect to feel when taking the diuretic and what you can do if a common side effect does occur. Don't stop taking the medicine or change the dosage without your doctor's advice.

When taking a diuretic you may need to eat foods rich in potassium or take a prescribed potassium supplement. Foods rich in potassium include fresh oranges, bananas, tomatoes, and apricots. Your body has warning signs to let you know the level of potassium is too low. If you become unusually thirsty, excessively weak and tired, or if you develop muscle cramps in your legs, call your doctor right away.

Some diuretics prevent the loss of potassium. It is important to know whether or not you require potassium replacement.

One possible side effect of diuretics is dehydration. Do not decrease the amount of fluid you drink in order to stop urinating (passing your water) so frequently. Dehydration is a sign of fluid imbalance. If you are dehydrated, your urine may look a darker yellow or brown and you may be very thirsty. Follow your doctor's advice for correcting dehydration.

Diuretics may cause a decreased blood pressure. You may feel dizzy or lightheaded, especially when you get up from a lying position. Change positions slowly. Let your doctor know about the dizziness. Drinking alcoholic beverages while taking a diuretic can make the dizziness worse.

Dizziness may also occur if you stand for long periods, exercise in hot weather or take hot showers or baths.

When you begin to take a diurectic, avoid too much sun or the use of a sunlamp. Notify your doctor if you get sunburned.

Do not stop taking your diuretic because you feel better, unless your doctor tells you to.

Be sure to tell all doctors and dentists that treat you that you are taking a diuretic.

Do not stop the diuretic if it has some of the side effects you have learned about. In most cases your doctor can prescribe other drugs or combinations of drugs that can do just as good a job without the unpleasant side effects.

Check with your doctor and nurse if you have questions or concerns. Remember, in order to get the most benefit from your medicine, you must be responsible for taking your diuretics correctly.

APPENDIX C

MEDICATION QUESTIONNAIRE

MEDICATION QUESTIONNAIRE

All answers will be kept confidential.

Age ____ Sex _____ Race _____

For the following questions circle the answer and fill in any blanks that apply.

Marital Status	Married	Widowed	Single	Divorced
Years of Schooling	0-3	4-11	12	12+
Reading Habits	Daily	Weekly	Monthly	None
Alcohol Use	Daily	Weekly	Monthly	None
Do you live alone?	Yes	No		

Are you taking any of the following?			Medication Name	Medication Purpose
Antibiotics (Penicillin, Sulfa, etc.)	Yes	No	_____	_____
Anticoagulants (Blood Thinners)	Yes	No	_____	_____
Asthma or Allergy Medicine	Yes	No	_____	_____
Digitalis	Yes	No	_____	_____
Nitroglycerin	Yes	No	_____	_____
Insulin or Diabetes Pills	Yes	No	_____	_____
Cortisone (Prednisone)	Yes	No	_____	_____
Tranquilizers	Yes	No	_____	_____
Sleeping Pills	Yes	No	_____	_____
Epilepsy Medicine	Yes	No	_____	_____
Aspirin	Yes	No	_____	_____
High Blood Pressure Medicine	Yes	No	_____	_____
Diuretics (Water Pills)	Yes	No	_____	_____
Potassium Supplement	Yes	No	_____	_____

Have any of the following health professionals

given you a verbal explanation of your medicines?	Doctor	Nurse	Pharmacist	None
given you a written explanation of your medicines?	Doctor	Nurse	Pharmacist	None
given you information about side effects?	Doctor	Nurse	Pharmacist	None
given you information about drug/ drug interactions?	Doctor	Nurse	Pharmacist	None
given you information about drug/ food interactions?	Doctor	Nurse	Pharmacist	None

Are you taking any of the following over-the-counter drugs?

Pain	Yes	No
Headache	Yes	No
Sleep	Yes	No
Cold	Yes	No
Stomach Upset	Yes	No
Constipation	Yes	No
Diarrhea	Yes	No
Vitamins	Yes	No
Other	Yes	No

Have you ever had a medication side effect? Yes No

Side Effect _____

What action did you take? _____

Do you ever share your prescription medication with anyone?	Yes	No
Do you have a system that helps you remember to take your medication?	Yes	No
Do you take medicines not ordered by your doctor?	Yes	No
Do you ever change the dosage of a prescribed medicine based on your medical symptoms?	Yes	No
Do you ever stop a drug before the prescription is completed?	Yes	No
Do you take prescriptions written by 2 or more doctors?	Yes	No
Do you have your prescriptions filled in 2 or more pharmacies?	Yes	No

Do you keep your prescriptions in the original containers? Yes No

What do you do if you miss a dose of your medicine?_____

_____

Where do you store your medicine?_____

Do you have any suggestions that could help other people take medicines correctly?_____

APPENDIX D

PRETEST-POSTTEST

PRETEST-POSTTEST

Directions: Circle the letter of the best answer for each question. Please answer all questions.

1. Diuretics help the body by causing it to lose
   a. water
   b. water and potassium
   c. water and salt
   d. water, potassium, and salt

2. A prescription label reads "Take once a day for fluid retention." This prescription is ordered to help
   a. your body retain fluids
   b. your body retain fluids that you drink
   c. prevent your body from losing fluids
   d. prevent your body from retaining fluids

3. Diuretics control the blood pressure by affecting the
   a. heart
   b. blood vessels
   c. kidneys
   d. cardiovascular system

4. If you take a diuretic two times a day and go to sleep at 10 p.m. every night, when is the best time to take the second dose of your medicine?
   a. after breakfast
   b. 6 hours before supper
   c. by 4 p.m. in the afternoon
   d. at 6 p.m. in the evening

5. It is important to take your diuretic medicine when you
   a. exercise more than usual
   b. feel your blood pressure is elevated
   c. are scheduled to take it
   d. take your other prescriptions

6. What should you do if you forget to take one dose of a diuretic?
   a. skip the forgotten dose
   b. take the forgotten dose as soon as possible
   c. take 2 doses at your next medication time
   d. comply with your doctor's advice

7. What should you do if you feel excessively thirsty and weak?
   a. increase the amount of fluids you drink
   b. decrease the next dose of your diuretic
   c. realize these effects will decrease when your body adjusts to the medicine
   d. decrease the dose of your diuretic, then call your doctor if the effects don't disappear

8. An adequate potassium level can be maintained by all of the following ways except
   a. dietary sources
   b. diuresis
   c. potassium supplements
   d. potassium sparing diuretics

9. The purpose of drinking fruit juice when taking a diuretic is to
   a. replace potassium
   b. prevent dehydration
   c. prevent potassium loss
   d. avoid potassium replacement

10. Which of the following is unrealted to dehydration?
    a. thirst
    b. dark urine
    c. fluid overload
    d. fluid deficit

11. When taking a diuretic you may feel dizzy if you
    a. urinate too frequently
    b. stand up too quickly
    c. use a sunlamp

12. Thirst is to dehydration as dizziness is to _____.
    a. alcohol
    b. sunburn
    c. lightheadedness
    d. weakness
    e. low blood pressure

13. The most common mistake an older person is likely to make in taking medicines is to
    a. take drugs that are not prescribed
    b. take a higher dosage than prescribed
    c. take a lower dosage than prescribed
    d. take drugs on an irregular schedule

14. Doctors and nurses can help you take your medicine correctly by all of the following ways except
    a. making sure you understand when to take your medicine
    b. explaining the uses and side effects of your medicine
    c. making sure you understand the prescription labels
    d. assuming their medication instructions are clear to you

15. When should you stop taking a diuretic?
    a. when the side effects are greater than the benefits
    b. when the symptoms of your medical condition disappear
    c. when the prescription is discontinued
    d. when you are dizzy
    e. when you are dehydrated

APPENDIX E

RECALL TEST OF DIURETIC INSTRUCTIONS

RECALL TEST OF DIURETIC INSTRUCTIONS

Directions: Try to remember the exact instructions you heard on the tape. Please fill in the missing word or words for all of the following statements.

1. Taking medications that are not _____ is another mistake.
2. If you take more than one dose a day, take the last dose _____ _____
3. Foods rich in _____ include apricots.
4. A _____ dose of medication should not be taken without your doctor's permission.
5. A common medication mistake is drug _____.
6. Don't stop the medicine or change the _____ without your doctor's permission.
7. Don't decrease the amount of fluid you drink in order to _____.
8. Diuretics may cause a decreased _____.
9. _____ while taking a diuretic can make the dizziness worse.
10. Avoid the use of a _____.
11. Do not stop taking your diuretic because you feel better unless _____.
12. Diuretics are used to treat _____ and _____ _____.
13. You may feel _____ or _____ especially when you get up from a lying position.
14. Try to take the diuretic at _____ every day.
15. It is important to ask your doctor what you can do if a common _____ does occur.

APPENDIX F

K-R 20 COMPUTATIONS

K-R 20 COMPUTATIONS

$$\text{K-R 20 } r_{xx} = \frac{k}{k-1} \left[1 - \frac{S_i^2}{S_x^2} \right]$$

where k = number of items in test

S_i^2 = variance of item --S_i^2 = pq

p = proportion of people who answered the item correctly

q = proportion of people who answered item incorrectly

S_x^2 = total test variance

Multiple-Choice instrument ---

$$15/14 \times (1 - \frac{2.75}{14.0}) = 1.07 \times (1 - .2) = .86$$

r_{xx} = .86

Short Answer test of recall ---

$$15/14 \times (1 - \frac{2.68}{8.96}) = 1.07 \times (1 - .30) = .75$$

r_{xx} = .75

APPENDIX G

KAHN-GOLDFARB MENTAL STATUS QUESTIONNAIRE

KAHN-GOLDFARB MENTAL STATUS QUESTIONNAIRE

Please answer all questions.

1. Where are we now?

2. Where is this place located?

3. What month is it?

4. What day of the month is it?

5. What year is it?

6. How old are you?

7. When is your birthday?

8. Where were you born?

9. Who is the President of the United States?

10. Who was President before him?

APPENDIX H

WRITTEN INFORMED CONSENT FORM

WRITTEN INFORMED CONSENT FORM

Dear Resident:

I am a Registered Nurse and a Nurse Educator studying Health Education at the University of Florida. As part of my doctoral studies I am gathering information on how nurses and doctors can help older people learn to use their prescribed medicines properly.

I am asking you to volunteer your participation. The procedures I will follow with participants are (a) determine your eligibility to participate, (b) ask you to answer questions about diuretics, (c) stay with you while you listen to a short tape of diuretic medication instructions, and (d) ask you questions about diuretics.

I will answer any questions that you have about the procedures. Your participation will be anonymous and information you provide will be kept confidential. You are free to withdraw your consent and discontinue your participation at any time.

Participants will not be given any monetary compensation.

One benefit to you for participating is a potentially increased understanding of how to take medicine correctly. Another very important benefit is that you would help fellow residents and other older persons learn to stay healthy through proper medication use.

I would appreciate your consent to participate in this activity.

I have read and I understand the procedure described above. I

_____ agree to participate in the procedure.

Signatures:

_____	_____	_____	_____
Subject	Date	Witness	Date

_____

Investigator's Name

Lanell C. Woods

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BIOGRAPHICAL SKETCH

Lanell Christine Woods was born in Jacksonville, Florida, where she graduated with honors from Nathan Bedford Forrest High School. As a scholarship recipient of the Walter Reed Army Institute of Nursing, she completed lower division studies at Florida State University and upper division nursing studies at the University of Maryland. She graduated with high honors earning a Bachelor of Science in Nursing from the University of Maryland.

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After beginning her doctoral studies in 1981, she was awarded a graduate assistantship at the University of Florida, College of Education. In August, 1983, Ms. Woods accepted her current position of Assistant Professor of Nursing at the University of North Florida.

Currently, Ms. Woods serves as the Training Coordinator for her U.S. Navy reserve hospital unit. She is a member of the American Nurses' Association and the Florida Nurses' Association. Her special research interests include gerontology, communication, cognition, and coping behaviors.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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