INPATIENT SELF-MEDICATION PROGRAM FOR PATIENT TEACHING

A THESIS

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE OF MASTER OF SCIENCE

IN THE GRADUATE SCHOOL OF THE

TEXAS WOMAN'S UNIVERSITY

COLLEGE OF NURSING

BY

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DENTON, TEXAS

AUGUST 1983

The Graduate School

Texas Woman's University

Denton, Texas

April 25 1983

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be accepted as fulfilling this part of the requirements for the Degree of Master of Science.

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ACKNOWLEDGEMENTS

I would like to express my sincere appreciation to all the people whose contributions have facilitated the completion of this research project. In particular I would like to acknowledge Dr. Margaret McElroy for her invaluable guidance and encouragement as my chairperson; Dr. Helen Bush and Dr. Lois Hough, my other committee members, for their assistance and support; my panel of patient education experts for their time and expertise; the nurses who were involved in teaching the subjects; and those patients who consented to serve as subjects in my study.

I also wish to give a special thanks to my parents and grandmother for their guiding love and support and for instilling in me a desire to pursue higher education and always continue my personal and professional growth. Most of all, I would like to express my gratitude to my husband, Gary, for his never-ending love, patience, and support, and my children, Bobby and Jenny, for being their loving selves throughout this endeavor.

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CHAPTER 1

INTRODUCTION

Patients are discharged from the hospital every day with the expectation that they assume the responsibility for carrying out orders prescribed for them by their doctor but administered by health care workers during their hospital stay. These orders sometimes include a complicated regimen of medications. Accurate self-medication is an essential daily activity at home. Great efforts are made to ensure that the patient receives the right drug at the right time by the right route in the hospital. However, teaching proper home administration of medications is often neglected. Many patients are treated, discharged, and readmitted frequently because they either do not follow their medication regimen at home or they take the medications improperly. It has been shown that between 40% and 90% of all patients take their medications in error (Mahoney, 1977).

Health teaching is an integral part of patient care and it is no less important in the area of medications. A British physician wrote:

> To discharge a patient from the hospital without detailed and accurate instructions has

> always seemed to me like rescuing a man from the seas, resuscitating him, and putting him back on the raft without even a paddle to get to safety. (cited in Mahoney, 1977, p. 196)

There is no guarantee that if given a paddle, one would be able to use it correctly. The same is true of patients. Even if they are given information on medications, there is no guarantee that they will be able to administer them at home correctly.

One effort to correct this problem has been the development of an inpatient self-medication program. Self-medication involves teaching patients to administer medications themselves, competently and confidently, in a controlled environment (Youngren, 1981). Such a program is based on the principle that regular practice sessions correct and reinforce learning, and lead to the development of safe practice (Macauley, Murray, & Ellis, 1980). This is a relatively recent development which is currently being utilized in a variety of institutional settings and should be evaluated.

Problem of Study

The problem of this study was: Is there a significant difference in the knowledge about medications of patients who are taught through an inpatient

self-medication program and patients who are taught in the traditional manner?

Justification of Problem

Misuse of medications by patients at home is a major problem. The extent of medication errors has been documented by studies on different types of patients including ambulatory patients (Boyd, Covington, Stanaszek, & Coussons, 1974), diabetic and congestive heart failure patients (Hulka, Cassel, Kupper, & Burdette, 1976), and elderly patients (Raffoul, Cooper, & Love, 1981). Other studies looked at the extent of lack of knowledge as a factor in medication errors (Kennedy, 1981; Leary, Vessalla, & Yeaw, 1971).

The inappropriate use of medications has caused higher hospitalization rates and longer lengths of stay (Sackett, 1976). Consumer demand, rising medical costs, legal pressures, and hospital accreditation have influenced health care professionals' concern with patient teaching. If the patient is not provided with adequate teaching, he can no longer be considered sufficiently treated. Studies have shown that patients want to learn about their illnesses and treatment (Bille, 1981). Patient teaching is the responsibility of every member of the professional health team. The role of the

nurse in patient teaching is emphasized by nursing leaders, educators, professional organizations, and in textbooks (Winslow, 1976).

Various educational methods have been instituted to meet the patients' need for learning. Studies have substantiated the value of teaching in patient care (Hecht, 1974; Rosenberg, 1971). Research has been performed comparing the effectiveness of different teaching techniques (Barbarowicz, Nelson, DeBusk, & Haskell, 1980; Israel & Mood, 1982; Scalzi, Burke, & Greenland, 1980). In the area of medications, studies have examined the use of a daily drug reminder chart (Gabriel, Gagnon, & Bryan, 1977), and the effect of repetition (Sechrist, 1979).

Another patient teaching program geared toward medications is the inpatient self-medication program. In the literature, 30 references described such programs. These programs utilize a variety of patient types including those involved in a rehabilitation program (Macauley et al., 1980); nursing home residents (Madaio & Clarke, 1977); psychiatric patients (Battle, Halliburton, & Wallston, 1982); respiratory patients (Youngren, 1981); postpartum patients (Mynick, 1981); cardiac patients (Buchanan, Brooks, & Greenwood, 1972); and epileptics (Nelson, Edwards, Roberts, & Keller, 1978). The programs

vary greatly in procedure, selection of patients, and involvement of nurses, physicians, and pharmacists. They range from total patient monitoring to close nurse monitoring--depending on the purpose of the program in the institution. Most of the above references cited give only a subjective evaluation of the program, noting advantages and disadvantages. Some of the benefits include increased independence, self-care skills, knowledge and understanding of therapy, and capability to administer medications. Additional advantages noted are decreased nursing time spent pouring medications, increased pride and self-confidence on the part of the patients, and improved interdepartmental cooperation with the pharmacy. The biggest disadvantage seen by the health care personnel was the amount of time necessary for teaching and supervising the patients.

Little research which evaluated self-medication programs was found in a literature search. Three studies comparing patients on self-medication programs with control groups in terms of knowledge or compliance were noted (Battle et al., 1982; D'Altroy, Blissenbach, & Lutz, 1978; Newcomer & Anderson, 1974).

The only study found comparing patients on self-medication programs with patients who are taught about

their medications in a traditional way was by D'Altroy et al. (1978). More of such studies are needed. Del Bueno (1978) stated that staff may become discouraged or demotivated with lack of evidence showing meaningful impact on patient teaching outcomes. A visible patient-teaching program may look good, but, unless its effectiveness can be demonstrated, valuable resources have been wasted. This study was conducted in an effort to provide information of this nature.

Theoretical Framework

Gagne's (1977) psychology of learning was chosen as the theoretical base for this study. The major concepts of the theory are the learning process, human capabilities, and the conditions of learning. A minor concept in the theory is procedure.

For Gagne (1975, 1977), learning is a process involving interaction with one's environment. It is inferred from a persisting change in behavior which is not attributable to the processes of growth alone. Gagne used an information processing model to describe the learning process. According to Gagne, the information processing model includes the subprocesses of expectancy, attention, selective perception, coding, storage entry, memory

storage, retrieval, transfer, responding, and reinforcement.

Gagne listed five types of observable human capabilities which are learning outcomes of processing information: verbal information, intellectual skills, cognitive strategies, motor skills, and attitudes. Verbal information is stating or telling facts. It is what an individual knows. Intellectual skills refer to the individual's knowing how to perform an act rather than knowing facts. They enable the learner to do something by using symbols to interact with the environment. Intellectual skills progress from simple to complex, building on the basic association forms of learning. The intellectual skills built upon prerequisites are called learning hierarchies. Learning is cumulative and progresses from discrimination to concepts and rules (Gagne, 1974, 1977). Cognitive strategies are skills with which one manages one's own learning, remembering, and thinking. They regulate the internal learning process and include problem-solving skills. Motor skills are the execution of movements. Lastly, attitudes are mental states which influence an individual's choice of behavior.

Gagne's (1977) third major concept, conditions of learning, are internal and external events which support

the learning process and explain the differences which occur. Internal conditions are the initial capabilities possessed by a learner. External conditions are factors in the individual's environment which can be altered or controlled and can form the basis of a theory of instruction. Optimal external conditions are described by Gagne (1977) for each human capability. External conditions for intellectual skills include providing cues for recall and retention, reinforcement, motivation by objectives, and providing opportunities for transfer of learning. For motor skills, the most important external condition is practice. Other conditions for motor skills are verbal instruction, pictures, demonstrations, and feedback. Motor skills are necessary for execution of a procedure.

Gagne (1977) defined a procedure as an intellectual skill--a rule determining sequence with which subordinate rules are associated. The execution of a procedure may require possession of motor skills which may or may not be new to the learner. If the component motor skills of a procedure have not been fully learned, practice of a procedure without the simultaneous practice of the necessary motor skills cannot be expected to contribute very much to the learning of the total activity. Gagne (1977)

contended that practicing the whole procedure along with the motor skills enhances learning.

Gagne's (1977) eclectic behavioral psychology can be applied to self-medication. Taking medications is a procedure. It is an intellectual skill with a sequence of rules and subordinate rules along with motor skill components. The rules involve how much medicine to take, when to take it, by what route, and under what conditions. Subordinate rules regard the type of medication and its action in the body. The motor skill portion of the procedure includes the component skills of choosing the correct pills and dosage at the correct time, under the correct conditions. These component skills are not new, but the activity of putting together the entire medication regimen may be quite complex. An inpatient self-medication program includes practicing the whole procedure along with the motor skills. It focuses on the intellectual skill and what the individual knows how to do as well as the motor skills. Teaching the individual the facts of his medication regimen focuses on verbal information only. External conditions are utilized in the self-medication program to enhance the internal learning processes. A medication teaching sheet helps direct attention, stimulate recall, and provide cues. Practice and review

enhance retention. Nurses provide feedback on the elicited performance. Based on Gagne's theory, both the cognitive and practice aspects of the inpatient self-medication program should lead to increased knowledge about medication.

Assumptions

The assumptions for this study were identified as:

1. Patient teaching is a vital function of professional nurses.

2. Nurses have the capability to teach.

3. Patients are human beings capable of learning verbal information, intellectual skills, cognitive strategies, motor skills, and attitudes.

4. Learning occurs through the internal processes of attention, selective perception, coding, response organization, and expectancies (Gagne, 1977).

5. Nurses, as teachers, can support the learning process by optimizing external conditions.

6. Practicing procedures including the motor skill components enhances learning (Gagne, 1977).

Hypothesis

The following null hypothesis was chosen for this study:

There is no significant difference in the knowledge about medications of patients who are taught through an inpatient self-medication program and patients who are taught in the traditional manner, as measured by the post-test scores on the Reid Medication Test, after adjusting for the pretest scores.

Definition of Terms

For the purpose of this study the following definitions were utilized:

1. Knowledge about medications: The score on the Reid Medication Test which is a seven-item, open-ended question test, measuring the patient's knowledge of the reason for taking, dosage, frequency, main side effect, and special instructions for each medication they are taking as well as what to do if a dose is missed (see Appendix A).

2. Inpatient self-medication program: The preparation and administration by the patient himself of medications prescribed by the doctor and kept at the hospital bedside, under direct supervision of a nurse, after being given a medication teaching sheet and taught each medication's name, reason for taking, dosage, frequency, side-effects, what to do if a dose is missed, and other special

instructions by a nurse in a one-nurse-to-one-patient situation (see Appendix B).

3. Traditional manner of teaching: Giving the patient a medication teaching sheet and teaching the name, reason for taking, dosage, frequency, side effects, what to do if a dose is missed, and other special instructions for each medication the patient is receiving, in a one-nurse-to-one-patient situation (see Appendix C).

Limitations

The following limitations for this study were recognized:

1. Levels of education and intelligence may vary among the subjects.

2. The subjects' motivation to learn and locus of control may vary.

3. Previous experiences in giving their own medications may vary.

4. The initial teaching may be done by different nurses.

5. Subjects may receive differing amounts of supervision and reinforcement from the nurses.

6. The population to which the research findings can be generalized is limited by the use of a small, convenience sample.

7. The reliabilities of the instruments were not previously measured.

Summary

Patients are discharged from the hospital every day and expected to follow accurately complicated medication regimens. One teaching method developed for the purpose of meeting patient teaching needs and combating the great extent of medication errors is the inpatient self-medication program. The problem of this study involved the difference between predischarge knowledge about medications of patients who participate in an inpatient self-medication program and those who are taught in a traditional manner. The problem is justified by the need to evaluate patient teaching programs and the lack of research on inpatient self-medication programs. Gagne's (1977) theory of learning is the theoretical framework. The hypothesis stated that there is no significant difference in the knowledge about medications of patients who are taught through an inpatient self-medication program and patients who are taught in the traditional manner, as measured by the posttest scores on the Reid Medication Test, after adjusting for the pretest scores.

CHAPTER 2

REVIEW OF LITERATURE

This review is divided into five sections. The first covers medication errors. Next, the nurse's role in patient teaching is reviewed, followed by a discussion of different teaching methods utilized to meet the patient's needs. Programs for teaching inpatient self-medication are also examined. Finally, the evaluation of nursing care and patient teaching is discussed.

Medication Errors

There are several extensive reviews of medication error studies. Stewart and Cluff (1972) examined studies of medication errors and compliance in ambulant populations. They reported errors ranging between 25% and 59%. Up to 35% of the patients were misusing medications in a manner which posed a serious threat to their health. Blackwell (1972) reviewed more than 50 studies which revealed that 25% to 50% of the population were drug defaulters. Mahoney (1977) reported that various studies indicated that between 40% and 90% of patients take their medications in error. These studies demonstrated that misuse of drugs is a serious health problem despite

variations in the definitions of terms and the study designs. The following section will discuss studies concerning classification and extent of medication errors, factors associated with medication errors, and patient knowledge about medications.

Classification of Errors

Various classifications of medication errors have been developed and used. Some authors include inaccurate knowledge as an error, and others focus only on errors in the actual taking of the medications. Also, noncompliance is sometimes included with errors of omission.

Schwartz, Wang, Zeitz, and Goss (1962) studied the medication histories of elderly, chronically ill, ambulatory patients in New York. Of 178 patients, 59% were found to make one or more errors, and 26% made potentially serious errors. Using an error classification system devised for the study, they found that two-thirds of the errors were those of omission. Next in order of frequency were inaccurate knowledge, errors of self-medication (taking medications not prescribed), and incorrect dosage. The least frequent error was incorrect timing or sequence. In a later study, Schwartz (1975) noted that omission was still the most frequent error, but inappropriate self-medication occurred more than inaccurate knowledge.

Neely and Patrick (1968) replicated the Schwartz et al. study. The sample included patients over 60, under private medical care, and living at home. Fifty-nine percent of the subjects made errors, and 32% made potentially serious errors. They found that omission was the most frequent error followed by inaccurate knowledge, self-medication, improper timing and sequence, and incorrect dosage.

Additional investigators have also classified and measured medication errors. From his review of medication error studies, Blackwell (1972) described errors as failure to take prescribed amounts, episodic medication, and excessive medication. Boyd et al. (1974) reported that improper dosing intervals was the most frequent medication error. Their definition of improper dosing intervals, however, included those listed as omissions in other studies. The investigators found that over 60% of ambulatory patients made errors. Hulka et al. (1976) defined four types of errors: omission, commission (similar to inappropriate self-medication), scheduling misconceptions (not knowing the schedule), and scheduling noncompliance. A group of 357 patients with diabetes and congestive heart failure made average error rates of 19%, 19%, 17%, and 3%, respectively--a combined average error rate of 58%.

Medication errors in the elderly were defined by Olson and Johnson (1978). Their list included: unintentional overdose, duplication (two drugs for the same problem), drug exchange, confusion, outdated drugs, self-selection of drugs, taking "prescribed as needed" drugs too often, automatic refill, and medication omission.

Raffoul et al. (1981) believed that how drugs are used results from interactions between the person, the physician, the pharmacist, and the drugs. Any one or more of these variables may contribute to drug misuse, particularly among the elderly. The incidence of drug misuse among a sample of ambulatory older people was surveyed by an interdisciplinary team with representatives from social work, medicine, and pharmacy. They measured eight major categories of drug misuse. These operationally defined categories included: taking drugs after the therapeutic need was met, discontinuing a drug before the therapeutic need was met, taking a half or less of prescribed medications, taking twice the amount of medications prescribed or more, taking medications prescribed for another individual, using alcohol or over-the-counter drugs known to have potential interactions with the prescribed drugs, using drugs stored improperly or with the wrong label, and taking a drug with a duplicate effect of another.

Instances of drug misuse were observed in 43% of the sample. Underuse accounted for 72% of the errors.

The overuse, underuse, or erratic use of drugs was the simple classification of drug errors used by Ellor and Kurz (1982). They recently surveyed drug-taking behavior of older adults. No patients reported getting instructions from health professionals.

Factors Associated with Medication Errors

In conducting medication error studies, many researchers also investigated the possible association of various factors with medication errors. Attempts to identify such factors have yielded inconsistent results. Schwartz et al. (1962) found that error makers were more likely to be over 75; widowed, divorced, or separated; live alone; have little education; be Catholic; and have a large number of diagnoses. The differences found were not large. There was no significant difference between error-making and error-free respondents on any characteristics in the research of Neely and Patrick (1968).

In his review of medication error studies, Blackwell (1972) reported that several factors possibly contribute to drug errors. These include complexity of the regimen, incidence of side effects, the number of doses per day,

sex, age, social supervision, socioeconomic factors, illness severity, and characteristics of the physician.

In Hulka's et al. (1976) study of diabetics and heart failure patients, when more drugs were involved there were more errors of omission and commission. When there was greater complexity in the regimen, more commission and scheduling misconception errors were made. There was no consistent pattern of drug errors in relation to patient characteristics or disease severity. For the heart failure patients only, good communication of instructions from the physician was associated with lower error rates. Raffoul et al. (1981) found two factors to be significantly positively associated with drug misuse: the use of two or more pharmacies, and having medications prescribed by two or more physicians.

Patient Knowledge about Medications

Several studies measured patient knowledge about their medications. Leary et al. (1971) classified patient knowledge as least informed (0-32% correct), less informed (33-64%), or informed (65-97%). Only 16.5% of their sample were considered informed and 49.4% were least informed. This demonstrated that most patients do not have adequate knowledge of medications for safe

self-administration. The greatest deficiency was knowledge of side effects. Knowledge was positively associated with age, employment status, and previous exposure to illness.

A study of six hospitals in the Netherlands which measured the expected and actual knowledge of hospital patients demonstrated that 50% of the patients had adequate medical knowledge (Pool, 1980). In the subarea of medications, 70% answered the questions correctly while doctors and nurses expected only 36% to answer correctly. Kennedy (1981) asked 21 patients about their diuretics. Based on the findings, the author concluded that their knowledge was greatly lacking.

Role of the Nurse in Patient Teaching

As early as 1918 the National League of Nursing Education noted the importance of health teaching (Redman, 1976). Increased emphasis on disease prevention, increased incidence of chronic disease, and increased numbers of elderly people are factors providing motivation to include patient teaching in health care delivery (Cohen, 1981). Chaisson (1980) listed the current economic slump and the high cost of health care as additional factors. Both the National League of Nursing and the American Hospital Association have published a patient's

bill of rights stating the patient has the right to health teaching (Bille, 1981; Grosser, 1981). This section discusses the question of whose responsibility it is to teach patients, nurses as teachers and their effectiveness and lack of effectiveness, and roles of other health team members in patient teaching.

Responsibility of Patient Teaching

Several authors addressed the question of whose responsibility it is to teach patients. Chaisson (1980) noted that the need for increased commitment to teach the consumer is being acknowledged on several fronts. She believed health teaching is the responsibility of all health care workers, with nurses having the primary responsibility. Simpson (1980) and Bullough (1981) encouraged nurses to fill the gap in patient teaching needs before other disciplines move in. Other disciplines include social workers, health educators, psychologists, and pharmacists. If this happens, another aspect of the ideal nursing role would be chipped away. Patient teaching is an area allowing optimal independent judgment and could help to advance nursing's professional status (Del Bueno, 1978).

Nursing and Patient Teaching

Patient teaching is accepted as an integral part of nursing practice (Benedikter, McWeeny, & Bille, 1980; Bille, 1981; Grosser, 1981). Nursing leaders, educators, texts, and organizations all emphasize the role of nurses in patient teaching (Winslow, 1976). Benedikter et al. (1980) stated that planned teaching as a nursing intervention should be common practice. Grosser (1981) believed that nurses in all settings should have patient teaching as a nursing goal.

The Joint Commission on the Accreditation of Hospitals has indicated that patient teaching should be given special consideration in nursing care plans (Bullough, 1981; Roach, Jr., 1981). The Joint Commission requires evidence of patient and family teaching and provides guidelines for evaluation of teaching. Teaching functions have been included in the nursing practice acts of some states, thus making it a legal obligation (Grosser, 1981; Roach, Jr., 1981).

Nurses are seen as being in a unique position to carry out patient teaching. This is due to such factors as high patient contact, increased likelihood of developing empathic relationships (Murdaugh, 1980), expertise, and an image of credibility and trustworthiness with the

public (Chaisson, 1980). Grosser (1981) believed nurses possess qualities inherent in good teachers--a good knowledge base and good communication skills. Patients are more receptive to nurses as teachers as they are less threatening than physicians.

Effectiveness of Patient Teaching

Studies have been conducted to show the effectiveness of nurses as teachers. Spector, McGrath, Uretsky, Newman, and Cohen (1978) were unable to show that intervention by specially prepared nurses would increase compliance in clinic patients when compared to clinic patients without nursing intervention. Linde and Janz (1979) demonstrated that nurses are effective health care teachers by the increase in knowledge and compliance of cardiovascular patients after a comprehensive teaching program. They concluded that masters-prepared nurses had a greater impact on patient learning than staff nurses. The authors highly recommended the use of masters-prepared nurses as developers, coordinators, and resource people for patient education programs. Murdaugh (1980) found that patients cared for by nurses knowledgeable in teaching-learning principles scored higher on a written test of knowledge about their disease than patients cared for by nurses not

knowledgeable in such principles. Pretests in the study also demonstrated that nurses were knowledgeable in content but not in teaching-learning principles.

It has been observed that despite the emphasis on patient teaching in nursing there is a discrepancy seen in actual practice. Organized teaching plans are inadequate or nonexistent, and patient teaching is ineffective (Bille, 1981; Bullough, 1981; Winslow, 1976). Syred (1981) labeled this lack of teaching as abdication of the nurses' role.

Various reasons have been listed for lack of effective patient teaching. In Pohl's (1965) survey of 1,500 practicing members of the American Nurse's Association, nurses revealed confusion over their teaching role, and feelings of lack of preparation to assume that role. The confusion and overlapping of the roles of nurses and doctors is a barrier to development of formal patient teaching programs (Russell, 1979). Other reasons include lack of assessment of patient readiness, failure to individualize, and lack of coordination (Chaisson, 1980). Murdaugh (1980) cited the obstacles of lack of time, patients not ready to learn, physician interference, and lack of skill. Lack of knowledge about community resources is added by Layne, Pekol, and Wineriter (1981).

Winslow (1976) believed nurses are not perceived by patients and doctors as competent in patient teaching. Bullough (1981) elaborated, stating that only 20% of a sample of post mastectomy patients identified nurses as a significant source of information. The consumer and other health care workers need to be educated about nursing's knowledge and skills.

Other Roles in Patient Teaching

The role of the nursing service director is integral to the success of patient teaching (Stevens, 1981). Stevens explored the question of whether patient teaching is a routine nursing function or a specialized function to be managed only by specially prepared practitioners. The author believed that teaching must be an intrinsic part of the basic nursing role, even if teaching is in the hands of inexpert teachers. It is the nursing service director's role to provide assistance for nurses to learn how to teach rather than providing experts to teach the patients. Del Bueno (1978) addressed the same dichotomy--centralized versus decentralized teaching. She also supports the decentralized or integrated approach which leads to teaching for the maximum numbers despite less effectiveness.

Hedberg (1981) discussed the role of the patient education coordinator in supporting and reinforcing the teaching skills of nurses to make them more comfortable. Syred (1981) took a different direction and described how the health belief model can provide nurses with a framework to formulate and structure their patient teaching.

Patient Teaching Methods

Many different methods are utilized to implement patient teaching. Some focus on structured techniques whereas others look towards using an interdisciplinary approach. Several authors discuss strategies geared specifically toward a certain group of people, the elderly. Audiovisual techniques and other methods for teaching about medications are found in the literature.

Structured versus Unstructured Methods

Several studies compare the effectiveness of structured versus unstructured patient teaching. Bille (1977) measured learning and the degree of compliance with post-hospital prescriptions after a structured program with pamphlets and booklets in addition to instruction to meet objectives, or the unstructured program of teaching currently in use. He found a higher, but nonsignificant,

learning after the structured format. Bille (1977) suggested that unplanned, unstructured teaching may be effective because it meets the needs of the individual at the time the need is expressed.

Another group of investigators, Barbarowicz et al. (1980) developed a standardized learning system of slide-sound modules and booklets for patients after coronary artery bypass grafts. A prospective randomized trial examined the effectiveness of this program compared to the traditional, informal, individualized method on a variety of parameters. Higher knowledge scores were obtained by the experimental group, but there were no differences in decrease in anxiety or increase in health enhancing behaviors.

Scalzi et al. (1980) conducted a quasiexperimental time series study and evaluated differences in knowledge and compliance of coronary patients after an organized teaching program or informal teaching at the patient's request. There was no significant increase in knowledge for either group during hospitalization, but after continued instruction during follow-up, knowledge did improve.

Multidisciplinary Teaching

The use of multidisciplinary teams in patient teaching has received emphasis. Rosenberg (1971) concluded that a multidisciplinary team with a coordinated educational approach was more effective in treating patients with congestive heart failure than similar agencies with uncoordinated teaching. The effectiveness of the program was assessed by measuring patient knowledge, compliance with dietary and medical regimens, and the number of readmissions for one year. Another interdisciplinary team from medicine, nursing, pharmacy, social services, and administration developed a program of discharge teaching in an effort to improve patient adherence to drug regimens (Romankiewicz, Gotz, Capelli, & Carlin, 1978). The program included teaching by nurses and pharmacists, and patient medication instruction cards; but it was not evaluated.

McCaughrin (1981) also advocated multidisciplinary planning of programs, coordination of implementation, and addressing emotional and psychological responses to ensure that teaching methods are effective. He stated that patient understanding is the key to quality patient teaching and gave suggestions for planning and determining patient understanding.

Teaching Methods for the Elderly

Patient teaching methods for the elderly are of concern. Kim and Grier (1981) studied the effect of pacing medication instruction on the learning of elderly clients. They confirmed the importance of slow instruction for the aged and emphasized the use of written instructions in addition to verbal teaching for review and recognition. To teach the older patient Bille (1980) proposed starting from a philosophy based on the theory of gerogogy, learning of the elderly. He stressed the importance of a thorough assessment and individualization of the teaching program. He did not support the use of standardized teaching care plans. Several strategies for teaching the elderly were presented.

In a similar article, Dall and Gresham (1982) discussed the required adaptations for teaching older patients, identification of patient learning needs, factors affecting learning in the aged, and strategies based on current theory and research. Individualization was also accentuated.

Audiovisual Techniques

Looking at audiovisual techniques for patient teaching, Israel and Mood (1982) reported significantly

increased knowledge for a patient group after a set of three media presentations on radiation therapy. A new technique for patient teaching is the use of the computer. In South Carolina the use of a microcomputer expands the services of a diabetes educator (Cook, 1982). Assessment is now in progress to measure the long term effect of computer use on learning and management of diabetes. In Albany, New York, a computer is used to teach cardiac patients interactively and at the patient's own pace (Lyons, Krasnowski, Greenstein, Maloney, & Tatarczuk, 1982). The computer's ability to teach patients has been documented, but it has not been compared to nurse teaching as it is utilized only as a supplemental source of education.

Methods for Teaching about Medications

Several other methods for teaching about medications are reported in the literature. Gabriel et al. (1977) found significant increases in knowledge about medications and compliance in a group of geriatric hypertensive patients given verbal instruction and a daily drug reminder chart. They were compared to a group with verbal instruction alone. Sechrist (1979) studied the effect of repetition on patient knowledge about drugs. She

concluded that one repetition of material significantly increased patient knowledge. The author recommended further study be performed to determine the optimum number of repetitions necessary to ensure maximum learning as only 35% of the patients could answer the questions correctly after one repetition.

Martin (1982) promoted individualized, comprehensive drug education to meet legal and professional obligations for patient teaching. He also supported inpatient self-medication, role-playing, and reinforcement. The importance of the behavioral component as well as information in patient teaching is emphasized by Beardsley (1978). Self-medication is a behavioral strategy using modeling and reinforcement.

Self-Medication Programs

Self-medication programs have been utilized for a variety of purposes in a variety of settings for several years. An early program mentioned in the literature is one reported by Parnell (1959). Postpartum patients self-administered certain selected medications in an effort to make their stay as natural as possible.

Psychiatric Settings

In the literature review psychiatric patients were the first group to participate extensively in such programs. Lacerva and Kennard (1960) believed that inpatient self-medication establishes continuity between hospital and community life and decreases the depersonalization noted in the hospital. It is a predischarge test of the patient's willingness and capacity to continue taking drugs without supervision (Gordon, Keller, & Lentini, 1966; Henderson, 1967; Mastrobuono, Snow, & Stevens, 1962; Pope, 1966). Patients are given increased responsibility showing they are trusted, and their pride and self-confidence increased. Periodic checks are made to make sure patients are taking their medications as well as whenever signs of regression are noted. Pope (1966) found that 5% of the patients on self-medication made errors and less than 2% took overdoses.

Gordon et al. (1966) surveyed Veteran's Administration mental hospitals and found that 33 out of 38 had self-medication programs in progress. They believed it was better for the patient to show slightly worse symptoms in the hospital than to have an acute exacerbation in the community as a result of mishandling drugs.

Actual procedures of the programs varied. A program for psychiatric patients in New Jersey has five different levels of increasing independence in self-medication (Francelmont & Sclafani, 1978). Lane (1981) expounded the need for self-medication to meet self-care teaching goals for psychiatric patients. Battle et al. (1982) evaluated the effects of two teaching methods on adherence of psychiatric patients to their regimens during self-medication and for 1 year after discharge. No significant differences in adherence were noted.

Rehabilitation Settings

Rehabilitation settings frequently have self-medication programs for the major purposes of maximizing independence and developing self-care skills. Falconer (1971) and Kelly (1972) described a program for elderly rehabilitation patients in British Columbia. Nurses have the responsibility of selecting patients, supervising, and directing the program. They observed increased pride and self-confidence and decreased use of analgesics with the program. Sather, Weber, George, Beilman, Rasplica, and Sweeney (1976) outlined a self-medication program on a spinal cord injury unit in Tampa clearly delineating the responsibilities of each member of the team--doctor, nurse, pharmacist, social worker, and psychiatrist.

Stonnington, Loehnen, Miller, and Bloom (1977) examined the impact of the pharmacist on teaching in a rehabilitation setting. Another pharmacist-coordinated program in Canada was investigated by Hannay (1977).

Self-medication in a large municipal hospital is used to increase compliance at home and decrease readmissions (Macauley et al., 1980). Nurses and pharmacists are responsible for counselling. A 22 month follow-up revealed 21 of 25 patients were managing satisfactorily at home. In a program for arthritic patients in California, nurses evaluate patients for physical and mental limitations, attitude toward the program, and degree of cooperation (Cockerman, 1970). The biggest disadvantage noted was the amount of time needed for teaching.

Patients on self-medication are usually supervised closely at first, and then indirectly followed with someone being available for clarification and answering questions (Cockerman, 1970; Kelly, 1972; Macauley et al., 1980; Reibel, 1969; Roberts & Miller, 1972). All programs required a doctor's order to initiate self-medication. The Joint Commission for the Accreditation of Hospitals stated that self-administration of medications by patients is permitted when specifically ordered by authorized house staff (Tousignaut, 1971).

A nursing home in New York started a self-medication program for the same purposes as those in the rehabilitation settings in addition to strengthening self-images and preserving the patient's individuality (Madaio & Clarke, 1977). A pharmacist directs the program and his skills in counselling help ensure its success. A pilot study conducted by Libow and Mehl (1970) to determine the abilities of elderly long-term patients in self-administration showed they had impressive capabilities. Of the 20 patients who were given placebos, only 5 made errors. Of 588 opportunities, only 14 errors were made, and 6 were by one patient.

Other Settings

Rosenberg (1970) reported about an Ohio internist who was convinced of the benefits of self-medication. This internist taught his patients and had them giving their own medications at four different hospitals for the past 30 years.

At Duke University Medical Center a self-medication program for cardiology patients was initiated using a pharmacist as the coordinator (Buchanan et al., 1972). Doctors, nurses, and pharmacists subjectively evaluated the program as beneficial and feasible.

Self-medication programs have also been described for epilepsy patients (Nelson et al., 1978), postpartum patients (Mynick, 1981), and respiratory patients (Youngren, 1981). Coyle (1979) reported the use of a pilot program with oral analgesics on a neuro-oncology unit. A 24-hour supply was given to the patients and monitored closely. Patients reported decreased anxiety, less pain, increased self-esteem, and less dependency.

A three-stage program of increasing responsibility of patients was investigated by D'Altroy et al. (1978). Experimental and control groups of post coronary care unit and medical-surgical patients were tested for knowledge and compliance 1 month after discharge. The group of self-medication patients showed significantly improved rates of compliance attributable to increased knowledge and participation in the program. The investigators also found that more internally oriented patients benefitted most from self-medication, and externally oriented control group patients were more compliant. The conclusion was that different types of learners may benefit from different educational approaches.

Expansion of a Self-Medication Program at a Single Institution

Reibel (1969) conducted a descriptive study to evaluate a pilot self-medication program with rehabilitation patients at Ohio State University. The report included how the patients functioned, errors made, and problems which were encountered. The doctors instructed the patients about their medications. Physicians, nurses, and pharmacists all considered the program feasible.

Johnson, Roberts, and Godwin (1970) and Roberts and Miller (1972) reported on the implementation of the Ohio State University program. Three options for medication administration are offered: nurse-administered, self-administered, and nurse monitored self-administered. The nurse monitored approach is used for teaching patients with decreased reliability or those with medications needing to be monitored closely for therapeutic use or toxicity. Medication error studies showed that the self-medication group made errors at rates lower or comparable to those in traditional drug distribution systems--8.3-20.6% (Roberts & Miller, 1972).

The program at Ohio State University was expanded further to include post-surgical patients (Newcomer & Anderson, 1974) and obstetrical patients (Lucarrotti,

Prisco, Hafner, & Shoup, 1973). A quasi-experimental study was done to determine if drug self-administration and patient teaching is an effective means of significantly reducing posthospital medication errors (Newcomer & Anderson, 1974). Two groups were compared. One group had self-medication and counselling by a pharmacist, and the other was a nurse-administered group with no teaching. The experimental group demonstrated significant improvement in knowledge of drugs, decreased incidence of self-discontinuance of drugs or failure to refill prescriptions, increased incidence of reporting adverse reactions, but no decrease in omission errors post discharge.

Evaluation of Patient Care and Patient Teaching

Much time and effort is put into patient teaching and there has been increased pressure for health care workers to show that their efforts have been effective (D'Onofrio, 1980; Holzemer, 1981). Evaluation of health care involves deciding what variables or patient outcomes to measure, how to measure them, and what to do with the results (Holzemer, 1981). Literature is divided into discussions of evaluation of patient care in general and specifically evaluation of patient teaching.

Several authors discussed evaluation in general. The future of evaluation in health care with specific implications for nursing is presented by Phaneuf (1980). Program evaluation and evaluation research are differentiated, compared, and contrasted. Program evaluation is a systematic inquiry applied to one specific program. Evaluation research is scientific inquiry with the purpose of developing generalizable results. Priority issues are proposed as directions for nursing evaluation research. Evaluation research is also defined as any scientifically-based activity undertaken to appraise the operation and impact of social action programs (Luker, 1981). Luker compared the evaluation process and the nursing process. The nursing process can provide a framework for the collection of data to be used retrospectively for evaluation research. There are four approaches to evaluation, and the author supported the process outcome method to advance evaluation research in nursing. Shanahan (1981) viewed evaluation in its relation to the quality assurance standard. From support shown at two symposia held on quality assurance, she believes patient care evaluation will come of age in the 80s.

Other authors specifically focused on evaluation of patient teaching. Holzemer (1981) listed varying

rationale for evaluation of patient teaching programs including documenting changes in behavior, increasing morale, justifying expenditures, and improving the program. He outlined the process for developing a protocol for evaluation. His process included writing a description of the program from a systems perspective, formulation of measurable evaluation questions, selection of design, selection and evaluation of instruments, data collection, analysis, and reporting the results.

Gilliland (1981) emphasized the necessity of systematic methods of evaluation of patient teaching. She described the retrospective questionnaires on knowledge and change in behavior used to evaluate diabetic and coronary care teaching programs. The ongoing evaluation helps identify problems and compares the effectiveness of the different teaching methods used. McSweeny (1981) reviewed the different instrumentation techniques necessary for the diabetes educator to measure the many different patient outcomes in order effectively to evaluate teaching of the diabetic. She listed five main types of instrumentation with advantages and disadvantages of each.

Nurses on an ophthamology unit initiated a study of the teaching program based on an application of change theory (Adom & Wright, 1982). They gave those most

affected by the program an opportunity to evaluate it. They compared patient and nurse satisfaction with group and individual teaching. Results revealed that patients preferred group teaching whereas nurses preferred a combination of methods.

Taking a different perspective, D'Onofrio (1980) examined a major evaluative question currently being asked about patient teaching--Can patient teaching help to control health care costs? She investigated values and motives underlying the current emphasis on evaluation, cost benefits, and cost effectiveness of patient teaching. D'Onofrio believed cost effectiveness evaluation can be used as a strategy for social change to integrate patient teaching into the health care system.

Summary

A review of the literature on topics pertinent to this study has been presented. The extent of medication errors, classification of medication errors, and factors having possible association with drug misuse were discussed. The role of the nurse in patient teaching was covered, and lack of effective teaching noted along with possible reasons. Comparisons of different teaching methods utilized to meet patient teaching needs were

presented. Inpatient self-medication programs in progress in a variety of settings were reviewed and compared as to the type of participants, purposes of the programs, supervision involved, and evaluations. Evaluation of patient care and patient teaching was discussed in the last section.

CHAPTER 3

PROCEDURE FOR COLLECTION AND TREATMENT OF DATA

The design chosen for this study was a quasi-experimental, pretest-posttest control group design. According to Polit and Hungler (1978), a quasi-experiment involves manipulation of the independent variable by the experimenter but lacks at least one of the other two characteristics of a true experiment--control or randomization. This study involved manipulation of the independent variable, had a control group, and a nonrandomized sample. The independent variable was traditional teaching or the self-medication program. The dependent variable was knowledge about medications as measured by the posttest score on the Reid Medication Test.

The pretest-posttest control group design is one of the designs suitable for evaluation of patient teaching programs (Holzemer, 1981). This evaluation research study was summative and comparative. It assessed a program already in operation and compared traditional teaching to the self-medication program. In this design a group of subjects were randomly assigned to the experimental and

control groups, each subject was pretested, given their treatment, and posttested, and the results were analyzed.

Setting

The setting for this study is a large hospital located in a major metropolitan area of the Southwestern United States. The particular unit utilized has 30 beds, 23 for post medical intensive care unit/coronary care unit (MICU/CCU) patients and 7 for general medicine patients. An inpatient self-medication program has been in operation on this floor for 4-1/2 years. It was approved for hospital-wide operation in 1980. The nurses on the floor are responsible for patient selection, teaching, supervision of self-administration of medications, and evaluation of patient progress.

Population and Sample

The target population consisted of all patients who were hospitalized on the selected unit during the time of data gathering who met the following criteria:

1. Male or female over the age of 18 years.
2. Any medical diagnosis.
3. Able to read and speak English.
4. Alert and oriented to person, place, and time.
5. In no acute distress.

6. Taking at least three but no more than eight oral routine medications.

7. Discharge not anticipated within the next 4 days.

8. Expecting to remain on the selected floor from the time of the pretest to the time of the posttest.

A convenience sample of available subjects meeting the stated criteria and willing to participate in the study was utilized. A convenience or accidental sample is a nonprobability sample--the use of the most readily available persons as subjects in a study (Polit & Hungler, 1978). To improve internal validity, the selected subjects were randomly assigned either to the experimental or control group. A coin was flipped and the first subject was assigned to the experimental group, and subsequent subjects were alternately placed in either the experimental or control groups as they became available. Selection of subjects continued until there were at least 10 completed pretests and posttests for each group.

Protection of Human Subjects

Permission to conduct this study was obtained from the Graduate School of the Texas Woman's University and the participating hospital prior to the collection of data (see Appendix D). The study was exempt from approval

by the Human Subjects Review Committee because it fell under Category 1 of Guidelines for Research Involving Human Subjects, effective September 17, 1981.

In an effort to protect the rights of each subject, several measures were taken. A verbal description of the study and its purpose was read to each prospective subject (see Appendix E), and a copy of this explanation was given to each subject. A guarantee of anonymity and confidentiality of information was offered to all participants. Participation was totally voluntary. Subjects' names were not used. Subjects were told they could withdraw from the study at any time. They were also told that withdrawal or nonparticipation would in no way affect the teaching or other medical or nursing care they would receive on the unit. Completion of the Reid Medication Test was considered to be informed consent.

Instruments

Four instruments were used in this study. These were the Reid Medication Test (Appendix A), Teaching Protocol (Experimental Group) (Appendix B), Teaching Protocol (Control Group) (Appendix C), and the Subject Information Record (Appendix F). Each of these instruments is now described.

Reid Medication Test

The instrument used for measuring the dependent variable is the Reid Medication Test (see Appendix A) designed by the investigator for the purpose of this study. The test was designed to measure the subject's knowledge of the reason for taking, dosage, frequency or time schedule, major side effect, and special instructions for each routine oral medication they are taking. It is a 7-item test with open-ended type questions to allow for use with multiple and differing medications. The medication was shown to the patient, and the name was stated. The seven questions were verbally asked of the subject about the medication. The subject's answers were recorded by the investigator. The test was repeated for each routine oral medication that the patient was taking in the hospital. The test was scored on the basis of a predetermined key. The answers were weighted three, two, or one. A three was an acceptably correct answer; a two, a partially correct answer; and a one, an incorrect answer. The total scores for the test of each medication were averaged to give a single score. A perfect score would be 21 points. The same test was administered prior to the teaching and 4 days after the initial teaching.

The reliability, or degree of consistency with which the instrument measures the attribute it is supposed to be measuring, was determined from the pretest results of this study. The coefficient alpha was measured as .71. According to Polit and Hungler (1978), for most purposes reliability coefficients above .70 are considered satisfactory.

After agency permission was granted, the instrument was administered to five patients who had already been taught about their medications to determine instrument clarity and the feasibility of patients being able to understand and complete the test. Ambiguous questions were reworded until the patients indicated clarity by completing the test.

The content validity, or the adequacy of the instrument to measure the subjects' knowledge about their medications, was established by a panel of three patient-teaching nurse specialists. The three experts were asked to review the items for clarity, relevance to the subject, and to determine if the test as a whole is an adequate representation of a patient's knowledge of a medication. Their suggestions were utilized in revising the instrument until at least two of the three agreed on the content

validity of each item. As a result of their suggestions, a seventh question was added to the original six.

Teaching Protocol (Experimental Group)

The Teaching Protocol (Experimental Group) (see Appendix B) is the level of the independent variable applied to the experimental group. This protocol is the inpatient self-medication teaching program. It consists of two parts--teaching plus closely supervised self-medication. Part I is a description of the preparation of the Medication Teaching Sheet and the information included in teaching the subjects about their medications. The Medication Teaching Sheet is included at the end of the protocol. Teaching was done on an individual basis.

Part II describes the procedure for implementing the self-medication portion of the program which was begun a day after the initial teaching. This includes the necessary materials, nurse demonstration, subject return-demonstration, and close supervision of self-administration by the nurses. It also provides for evaluation of patient progress. This protocol was formulated by the investigator based on the program in progress at this time on the unit which is the setting for this study.

Teaching Protocol (Control Group)

The Teaching Protocol (Control Group) (see Appendix C) is the level of the independent variable applied to the control group. This protocol is the traditional manner of teaching including individualized teaching about medications with no practice at self-medication. It also consists of two parts for the purpose of consistency. Part I is identical to Part I of the teaching protocol for the experimental group. Part II includes the traditional nurse administration of medications with reinforcement of the previous teaching.

Subject Information Record

The Subject Information Record (see Appendix F) is a record of demographic and other pertinent data which was completed for each subject in the study. The information was used to describe the sample. The investigator used patient records to collect age, sex, ethnicity, marital status, and medical diagnosis. Other pertinent information includes dates of the pretest, posttest, and the initial teaching, the number of medications tested on, and the group of the study the subject was in. The record was identified by the subject number, and no name was used.

Data Collection

After agency permission was obtained and the instrument wording finalized, convenience sampling was utilized to obtain subjects. Those who were selected and consented to be subjects were assigned to a study group and given a subject number. The investigator completed the Subject Information Record. A separate sheet kept by the investigator matched the subject's name to his number. The number was on the Subject Information Record, the pretest, and posttest. Once the posttest was completed, the sheet matching the name to the number was destroyed.

The Reid Medication Test was administered verbally to the subject. The test was repeated for each of the patient's routine oral medications. After the pretest was completed, the patient's nurse was notified that he was eligible for teaching. The nurses were familiarized with the teaching protocols and the protocols remained available on the unit. If the patient's nurse was unable to initiate teaching, the investigator did so.

The nurses were responsible for notifying the patient of changes in the medication regimens and making the necessary changes on the patient's medication teaching sheet. If a medication was discontinued leaving a patient with less than three medications, the patient was to have

been dropped from the study. This did not occur. If the patient still had at least three medications, the results from the pretest on the discontinued medication were subtracted and the remaining average was used. This occurred once. If a medication was added after the pretest, it was not included in the posttest. This occurred several times. If a patient was discharged or transferred before the posttest was given, the patient was dropped from the study. This happened six times. If a patient in the experimental group developed acute distress, the nurse gave that patient his medications. If a patient in either group had acute distress for more than 12 hours, he was to have been dropped from the study. This did not occur. If the patients were on insulin injections or topical medications, these medications were included in the teaching and listed on the teaching sheet. These medications were self-administered by the experimental group subjects, but the subjects were not tested on them. Controlled substances were not included in the teaching or self-medication.

The posttest was administered to both the experimental and control groups 4 days after the initial teaching. The experimental group had been self-administering medications for 3 days. Test items were reviewed with

the subjects after the posttest to correct and clarity misconceptions.

Treatment of Data

Descriptive statistics were used to analyze the demographic data from the Subject Information Record. The raw data was the pretest and posttest scores of both the experimental and control groups. The scores for all the medication tests for each subject were averaged to yield one score for the pretest and one score for the posttest.

The inferential statistical method, analysis of covariance, was utilized to analyze the posttest scores. The independent variable was the traditional teaching or teaching of self-medication. The dependent variable was the posttest scores, and the covariate was the pretest scores. According to Polit and Hungler (1978), the analysis of covariance tests the significance of the difference between group means after first adjusting the scores on the dependent variable to eliminate the effects of the covariate. It is useful when it is not feasible to randomize. In this study the groups may have been unequal in terms of prior knowledge about medications, and the analysis of covariance adjusts for this difference. The

final analysis reflected the effect of the teaching more accurately. The accepted level of significance was .05.

CHAPTER 4

ANALYSIS OF DATA

A quasi-experimental pretest-posttest control group study was conducted for the purpose of determining if a significant difference exists between the knowledge about medications of patients who were taught through an inpatient self-medication program and patients who were taught through a traditional method. The Reid Medication Test was used to collect data. This chapter presents a description of the sample and the findings of the study after the data was analyzed using an analysis of covariance.

Description of Sample

Of the 187 potential subjects on the unit during the time of data collection, 26 patients met the eligibility criteria and consented to be subjects in the study. Six of the subjects who were pretested, three from each group, were dropped from the study, a 23% attrition rate. Three were discharged, one left against medical advice, and two were transferred to other floors before the posttests were given. The remaining subjects were divided evenly with 10 in each group.

The ages of the subjects ranged from 39 to 71, with a mean of 56.65 years. The experimental group ranged from 39 to 71, with an average of 55.1 years and a standard deviation of 11.68. The control group ranged from 49 to 71, with a mean of 58.2 years and a standard deviation of 7.02. The most frequent age group for the control group was 50-59, while the most frequent age group for the experimental group was equally divided between 50-59 and 60-69. Table 1 depicts the age distribution of the sample by groups.

Table 1

Age Distribution by Group

Age by Year	Number of Subjects (Percentage)		
	Experimental	Control	Total
30-39	1 (10%)	0	1 (5%)
40-49	2 (20%)	1 (10%)	3 (15%)
50-59	3 (30%)	6 (60%)	9 (45%)
60-69	3 (30%)	2 (20%)	5 (25%)
70-79	1 (10%)	1 (10%)	2 (10%)
Totals	10	10	20 (100%)

Of the sample, 70% were female and 30% were male. The experimental group consisted of 60% female and 40% male. The control group had 80% female and 20% male.

Regarding marital status, the entire sample consisted of 35% married, 25% widowed, 25% divorced, 10% separated, and 5% single (never married). Table 2 depicts the marital status distribution of the sample by group.

Table 2

Marital Status Distribution by Group

Marital Status	Number of Subjects (Percentage)		
	Experimental	Control	Total
Married	5 (50%)	2 (20%)	7 (35%)
Divorced	2 (20%)	3 (30%)	5 (25%)
Separated	0	2 (20%)	2 (10%)
Widowed	2 (20%)	3 (30%)	5 (25%)
Single (never married)	1 (10%)	0	1 (5%)
Totals	10	10	20 (100%)

The ethnicity of the subjects was distributed into three categories with the majority of both groups being Afro-American (black)--80%. There were also 15% Caucasian (white) and 5% Mexican-American.

The distribution of the diagnoses of the subjects as noted on their records shows that 75% had diagnoses of chest pain, rule-out myocardial infarction, or status post myocardial infarction. Other diagnoses of patients in the experimental group include renal failure/congestive heart failure and cardiac arrythmias. Other diagnoses of patients in the control group were pulmonary edema, alcoholic liver disease, and deep venous thrombosis.

The number of medications the patients were tested on ranged from 3 to 7 in both groups. The mean number of medications for the experimental group was 3.8, and the mean for the control group was 4.3. The mode for each group was 3, comprising 50% of each group. A total of 81 pretests and posttests were given to the 20 subjects over a total of 27 different medications. Table 3 represents the distribution of the number of medications tested by group.

Findings

With seven questions, the possible scores for each test ranged from 7 to 21 with the answers being weighted 3, 2, or 1, as described in Chapter 3. A score of 7 meant 0% correct and a score of 21 meant 100% correct. For the experimental group the pretest scores ranged from 11

Table 3

Distribution of Number of Medications Tested by Group

Number of Medications	Number of Subjects (Percentage)		
	Experimental	Control	Total
3	5 (50%)	5 (50%)	10 (50%)
4	4 (40%)	1 (10%)	5 (25%)
5	0	2 (20%)	2 (10%)
6	0	0	0
7	1 (10%)	2 (20%)	3 (15%)
Totals	10	10	20 (100%)

(28.6%) to 17 (71.4%), with a mean score of 13.09 (43.5%). The posttest scores ranged from 13.3 (45%) to 20.7 (97.8%), and a mean of 16.04 (64.6%). All subjects showed improvement with increases ranging from .3 to 5.3, with an average improvement of 2.95 (21%).

The control group had pretest scores ranging from 7 (0%) to 15.9 (63.6%), and a mean of 12.82 (41.6%). The posttest scores ranged from 12.0 (35.7%) to 19.7 (90.7%), with an average of 16.17 (65.5%). All control group subjects also showed improvement with increases ranging from .3 to 8.8, with a mean improvement of 3.35 (23.9%). Table 4 represents the distributions of scores on the pretests

Table 4

Distribution of the Pretest and Posttest Scores by Group

Scores		Numbers of Subjects			
		Experimental		Control	
Percentage	Raw	Pretest	Posttest	Pretest	Posttest
0-20%	7.0- 9.8	0	0	2	0
21-40%	9.9-12.6	4	0	1	1
41-60%	12.7-15.4	5	4	5	1
61-80%	15.5-18.2	1	5	2	6
81-98%	18.3-20.7	0	1	0	2
Totals		10	10	10	10

and posttests on the Reid Medication Test by groups. The greatest deficiency was knowledge about side effects and what to do should they occur.

The hypothesis of this study, that there is no difference in the knowledge about medications of patients who are taught through an inpatient self-medication program and patients who are taught in the traditional manner, was tested using an analysis of covariance. The adjusted group means are 15.95 for the experimental group and 16.27 for the control group. Table 5 represents the pretest, posttest, and adjusted group means.

Table 5

Pretest, Posttest, and Adjusted Group Means

Group	Mean		
	Pretest	Posttest	Adjusted Group
Experimental	13.09	16.04	15.95
Control	12.83	16.17	16.27

Table 6 represents the outcome of the analysis of covariance for the posttest scores on the Reid Medication Test using the pretest scores as the covariate. The results of the analysis of covariance are $F(1,17) = .14$, $p = .71$; thus, the null hypothesis is retained. There was no significant difference shown in knowledge about medications of patients who were taught through an inpatient self-medication program and patients who were taught in the traditional manner, after adjusting for the pretest scores. For the zero slope, with $F = 13.41$, and $p = .002$, there was a significant relationship between pretest and posttest scores. The slopes of the groups are equal with $F = 1.50$, and $p = .24$.

Summary of Findings

The raw scores of the Reid Medication Test indicate that there was an increase in knowledge for both the

Table 6

Analysis of Covariance for Posttest Scores on Reid Medication Test

Source of Variance	df	SS	MS	F	p
Equality of adjusted means	1	.46	.46	.14	.71
Zero slope	1	43.55	43.55	13.42	.002
Error	17	55.18	3.25		
Equality of slopes	1	4.72	4.72	1.50	.24
Error	16	50.46	3.15		

groups, and the control group had a slightly higher mean improvement. An analysis of covariance revealed no significant difference between the adjusted group means and the null hypothesis was accepted. There was no significant difference in knowledge about medications of patients who were taught through an inpatient self-medication program and patients who were taught by the traditional method.

CHAPTER 5

SUMMARY OF THE STUDY

The problem of this study was to determine if there was a significant difference between the knowledge about medications of patients who were taught through an inpatient self-medication program and patients who were taught in the traditional manner. This chapter presents a summary of the study, a discussion of the findings, conclusions and implications, and some recommendations for further study.

Summary

A quasi-experimental pretest-posttest control group study was conducted. The study was justified by the need to evaluate patient teaching programs and the lack of research on self-medication programs as noted in the literature. The theoretical framework for this study was Gagne's (1977) theory of learning. According to Gagne, practicing the whole procedure including the motor skills enhances learning. The null hypothesis was proposed that there was no significant difference in the knowledge about medications of patients who are taught through an inpatient self-medication program and patients who are

taught through the traditional method. For protection of human subjects permission was obtained following an oral explanation of the study and completion of the Reid Medication Test constituted informed consent.

The convenience sample utilized consisted of 20 patients from a large metropolitan hospital on a post MICU/CCU-general medicine unit who met the eligibility criteria and consented to participate. The subjects were randomly assigned to one of two groups, experimental or control. As patients became available they were pretested and demographic data were collected. The patient's knowledge about medications was measured by the Reid Medication Test, developed for the purposes of the study. The Reid Medication Test has seven open-ended questions which were verbally asked of the subjects about each of the routine oral medications the patient was receiving. The items were scored as correct (3), partially correct (2), or incorrect (1), based on a predetermined answer key.

The control group patients were taught about their medications according to the teaching protocol for the control group. The initial teaching was frequently reinforced and the patient received medications as usual from the nurses. The experimental group patients were also taught about their medications in a similar manner

to the control group according to the teaching protocol for the experimental group. On the 2nd day the experimental group subjects started administering their own medications under the supervision of the nurses. Both groups were posttested 4 days after the initial teaching.

Descriptive statistics were used to describe the sample. An analysis of covariance was utilized to analyze the data. The traditional teaching and the inpatient self-medication program were the levels of the independent variable, the posttest scores represented the dependent variable, and the pretest scores represented the covariate.

Discussion of Findings

In this study no significant difference was found in the knowledge about medications of patients who were taught through an inpatient self-medication program and patients who were taught through the traditional method. This finding is not consistent with the findings of D'Altroy et al. (1978). In their study, patients who participated in a self-medication program learned more about their medications while in hospital than control group patients who were given traditional hospital care and instruction about medications.

Newcomer and Anderson (1974) also reported that drug self-administration and drug counselling by a pharmacist significantly improved the patients' knowledge of drug names, of optimum times to take the medications, of common side effects and special instructions, and of adverse or allergic reactions. Knowledge of drug appearance and knowledge of the number of times a day to take each medication was not significantly enhanced by drug self-administration and pharmacist counselling. The control group in their study did not receive any treatment. Within the present study the self-medication program may have led to greater knowledge in only certain areas and the traditional method enhances learning in other areas resulting in equal overall improvements. Analysis of the tests question by question may provide additional important data.

There may be other reasons why no significant difference was found in the knowledge about medications of the two groups. The 3 days the experimental group subjects were on self-medication may not have been long enough to obtain the benefits of increased knowledge. For the first 3 days the patients may be concentrating more on the mechanical aspects of the program in giving medications rather than the cognitive aspects.

D'Altroy et al. (1978) noted that the more internally oriented a patient was, the more likely he was to benefit from the self-medication program. Perhaps the patients in the experimental group of this study were more externally oriented and did not benefit as much as possible.

Compared with the knowledge scores reported by Leary et al. (1971), the scores from this study were higher. However, it is recognized that the sample size in this study was much smaller. They noted that 49.4% of their sample were least informed (0-32% correct), 34.1% were less informed (33-64% correct), and only 16.5% were informed (65-97% correct). Using the same classification for the results from this study, the pretests showed that the experimental group was 10% least informed, 80% less informed, and 10% informed. The control group was 20% least informed and 80% less informed. The posttests of both groups showed they were 50% less informed and 50% informed. The authors noted the greatest deficiency to be knowledge of side effects as was also noted in this study. A possible reason for this is that side effects are often not written anywhere as is other information and instructions.

Conclusions and Implications

Conclusion

Based on the findings of this study, the following conclusion is made: Learning did occur, and both methods of teaching seem to be effective for the type of patients and conditions of this study.

Implications

The results of this study have implications for health care professionals. Follow-up teaching is necessary for the participants of this study to improve their knowledge about medications. Regularly reinforced teaching about medications should be continued through various methods until implications from more generalizable findings can be applied to nursing practice. Nursing administration might prefer that the most cost-effective method be used.

Studies evaluating the effectiveness of inpatient self-medication programs continue to be indicated. The effectiveness of the program should be measured on various parameters including knowledge about medications, medication errors, and compliance. The self-medication program should be continued, developed, and expanded as it does provide regularly reinforced teaching. Since the area of

greatest knowledge deficiency was knowledge of side effects, this should be stressed in the teaching.

Recommendations for Further Study

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

1. Replicate this study utilizing a randomly selected, larger population sample with revision of the medication teaching sheet to include a space to write side effects.

2. Conduct a similar study with analysis of the data question by question to determine significant differences in knowledge in different areas.

3. Conduct a longitudinal study with a larger sample with traditional teaching and a self-medication program measuring knowledge about medications at discharge and 1 and 6 months post discharge.

4. Conduct a longitudinal study with the two teaching methods measuring medication errors and compliance at 1 and 6 months post discharge.

5. Conduct a similar study with a larger sample using different lengths of time from the pretest to the posttest to determine the interval for maximum learning while on the self-medication program.

6. Conduct a similar study measuring another variable, locus of control, to see if internally oriented patients on self-medication learn more than externally oriented patients or those in a control group.

APPENDIX A

I UNDERSTAND THAT MY COMPLETION OF THIS TEST CONSTITUTES MY INFORMED CONSENT TO ACT AS A SUBJECT IN THIS RESEARCH.

Subject number _____

Reid Medication Test

The medication is to be shown to the patient, and the name of the medication as it is ordered will be stated. The following questions will verbally be asked of the patient about the medication shown.

1. Why are you taking this medication?

2. What time of day or how often do you take this medication?

3. How much of this medication do you take each time?

4. What is one possible side effect of this medication?

5. If this side effect occurs, what should you do?

6. Is there anything special that you need to remember when taking this medication? If so, what is it?

7. What should you do about taking your medication if you miss a dose of this medication?

APPENDIX B

Teaching Protocol (Experimental Group)

Part I.

1. Prepare the attached medication teaching sheet to best meet the patient's needs: (a) schedule times during his/her waking hours if possible; (b) schedule as many medications together as possible to limit the number of times medication is required.

2. In the top half of the sheet include each routine oral medication's name and reason for taking. Tape the exact dosage or a sample of the pills on the appropriate space. If the medication is a liquid, draw a picture instead.

3. In the bottom half of the sheet include the medication time schedule. Beside each time the name of the medications and their dosages will be written.

4. Explain the content of the medication teaching sheet to the patient.

5. For each medication, teach the patient the major side effects of that medication, and what to do should those side effects occur.

6. Teach the patient any pertinent special instructions (i.e., take with meals, verify a pulse greater than 50).

7. Document the side effects and special instructions taught to each patient for each medication on the answer key in the designated area of the unit.

8. Teach each patient the following additional instructions:

a. Medications taken within 1 hour of the designated time are considered on time and should not be skipped.

b. If a medication is taken 3 or more times a day and a dose is more than an hour late, the patient should skip that dose and take the regular dose at the next regular time. Do not double a dose to catch up.

c. If a medication is taken once or twice a day, and is more than 6 hours late, the patient should skip that dose and take the regular dose at the next regular time. If it is less than 6 hours late, the patient should go ahead and take that dose.

d. Never allow a medication to run out.

e. Take all medications, the medication teaching sheet, and clinic card to any clinic visit.

f. Use an alarm clock for a reminder of medication times at home, especially during the night.

Part II.

1. Instruct the patient to study the medication teaching sheet for a day.

2. After the patient has studied the sheet for a day, assemble the necessary equipment:

a. A 3-day supply of each medication with the same name on the medication teaching sheet and the drug container.

b. Container for all medications.

c. Souffle cups and/or calibrated medicine cups for liquid.

d. Container for storage of prepared medications.

3. Demonstrate the process of medication preparation to the patient and evaluate his/her understanding of the process by having him/her give a return demonstration of medication preparation.

4. If a patient understands the procedure, explain that he will be giving his own medications under the supervision of a nurse. He will be notified of each medication time. He will prepare the medication and have them checked for accuracy by a nurse each time prior to his taking them. Stress the importance of his not taking the medication without a nurse's approval.

5. If it is necessary to deviate from the protocol, the patient will be dropped from the study.

6. Supervise the patient's self-administration of medications at each dose after checking them for accuracy. Chart the medication and teaching on the chart according to procedure.

7. Evaluate the patient's ability to give medications and document.

8. Patients may prepare their medications dose by dose, or once a day for 24 hours.

9. Reinforce the initial teaching while supervising the self-administration.

10. Injections such as insulin and topical medications may be included in the teaching and self-administrations, but the patient will not be tested over them.

11. If a patient should develop acute distress, the nurse may elect to prepare and give the patient's medications. If the patient is unable to give his medications for over a 12-hour period, notify the investigator, and he will be dropped from the study.

12. If any medication changes are made by the doctor, explain them to the patient and make the necessary changes on the medication teaching sheet.

PATIENT'S NAME ______________________

MEDICATION TEACHING SHEET—1

EXAMPLE OF PILL	MEDICINE/ REASON FOR TAKING	EXAMPLE OF PILL	MEDICINE/ REASON FOR TAKING

TIME	MEDICINE & DOSE	TIME	MEDICINE & DOSE

51328

APPENDIX C

Teaching Protocol (Control Group)

Part I.

1. Prepare the attached medication teaching sheet to best meet the patient's needs: (a) schedule times during his/her waking hours, if possible; (b) schedule as many medications together as possible to limit the number of times medication is required.

2. In the top half of the sheet include each routine oral medication's name and reason for taking. Tape the exact dosage or a sample of the pills on the appropriate space. If the medication is a liquid, draw a picture instead.

3. In the bottom half of the sheet include the medication time schedule. Beside each time the name of the medications and their dosages will be written.

4. Explain the content of the medication teaching sheet to the patient.

5. For each medication, teach the patient the major side effects of that medication, and what to do should those side effects occur.

6. Teach the patient any pertinent special instructions (i.e., take with meals; verify a pulse greater than 50).

7. Document the side effects and special instructions taught to each patient for each medication on the answer key in the designated area of the unit.

8. Teach each patient the following additional instructions:

a. Medications taken within 1 hour of the designated time are considered on time and should not be skipped.

b. If a medication is taken 3 or more times a day and a dose is more than an hour late, the patient should skip that dose and take the regular dose at the next regular time. Do not double a dose to catch up.

c. If a medication is taken once or twice a day, and is more than 6 hours late, the patient should skip that dose and take the regular dose at the next regular time. If it is less than 6 hours late, the patient should go ahead and take that dose.

d. Never allow a medication to run out.

e. Take all medications, the medication teaching sheet, and clinic card to any clinic visit.

f. Use an alarm clock for a reminder of medication times at home, especially during the night.

Part II.

1. Instruct the patient to study the medication teaching sheet.

2. Give the medications according to routine hospital policy. Chart the medication and teaching on the chart according to policy.

3. Reinforce the initial teaching while giving routine medications.

4. Injections, such as insulin, and topical medications may be included in the teaching, but the patient will not be tested over them.

5. If a patient develops acute distress for over a 12-hour period, notify the investigator and the patient will be dropped from the study.

6. If any medication changes are made by the doctor, explain them to the patient and make the necessary changes on the medication teaching sheet.

PATIENT'S NAME ______________________ MEDICATION TEACHING SHEET—1

EXAMPLE OF PILL	MEDICINE/ REASON FOR TAKING	EXAMPLE OF PILL	MEDICINE/ REASON FOR TAKING

TIME	MEDICINE & DOSE	TIME	MEDICINE & DOSE

51328

APPENDIX D

TEXAS WOMAN'S UNIVERSITY
COLLEGE OF NURSING

AGENCY PERMISSION FOR CONDUCTING STUDY*

THE _____

GRANTS TO Helen Reid
a student enrolled in a program of nursing leading to a Master's Degree at Texas Woman's University, the privilege of its facilities in order to study the following problem.

Inpatient Self-Medication Program for Patient Teaching

The conditions mutually agreed upon are as follows:

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

Date: 12/5/82

_____
Signature of Agency Personnel

Helen Reid
_____
Signature of Student

Marcia Lynn Elrod
_____
Signature of Faculty Advisor

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

Prospectus for Thesis
Approval Form

This proposal for a thesis by Helen Reid

and entitled Inpatient Self-Medication Program for Patient Teaching

has been successfully defended and approved by the members of the Thesis Committee.

This research is X is not _____ exempt from approval by the Human Subjects Review Committee. If the research is exempt, the reason for its exemption is: The research falls under Category 1 of Guidelines for Research Involving Human Subjects (effective 9-17-81).

Thesis Committee: Margaret McElroy, Chairperson
Lois Haight, Member
Helen A. Bush, Member

Date: 10-28-82

_____ Dean, College of Nursing

Date: _____

BVW/smu
10/14/81

Texas Woman's University
P.O. Box 22479, Denton, Texas 76204 (817) 383-2302, Metro 434-1757, Tex-An 834-2133
THE GRADUATE SCHOOL

February 10, 1983

Mrs. Helen Veronica Reid
4332 Crestover Drive
Mesquite, TX 75150

Dear Mrs. Reid:

I have received and approved the Prospectus for your research project. Best wishes to you in the research and writing of your project.

Sincerely yours,

Robert S. Pawlowski
Provost

ec

cc Dr. Anne Gudmundsen
Mrs. Margaret McElroy

APPENDIX E

Oral Explanation of Study to Prospective Subjects

Hello, my name is Helen Reid. I am a registered nurse and a graduate student at Texas Woman's University. As part of my study program I am conducting a research study evaluating the teaching about medications done on this floor. I would like for you to participate in this study. It will involve your taking a test about your medications before you start, to show us what you need to learn; being taught about your medications by myself or one of the other nurses; and retaking the test 4 days later. You will be assigned to one of two teaching groups. Your responses on the tests will be kept completely confidential. No names will be used in the report of this study. The possible benefit for you is your learning more about your medications. There are no known risks or discomforts involved if you participate. There is no medical treatment or compensation for complications incurred as a result of participating in this research. I will answer any questions you may have concerning the study. I will also need to review your medical record to obtain some more information. Completion of the test constitutes your informed consent to act as a subject in this

research. You may change your mind about participating and withdraw at any time without any effect on the medical or nursing care you will receive.

APPENDIX F

Subject number: _____

Subject Information Record

1. Age: (in years) _____ 2. Sex: M _____ F _____
3. Marital status:

   married _____ widowed _____ single (never) _____ married

   separated _____ divorced _____
4. Ethnicity:

   Caucasian (white) _____ Afro-American (black) ____

   Mexican-American _____ Oriental _____

   Other (specify) _____
5. Diagnosis: _____
6. Date of pretest: _____
7. Date of initial teaching: _____
8. Date of posttest: _____
9. Experimental group: _____ Control group: _____
10. Number of medications receiving _____

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