

THE EFFECT OF TEACHING ON PATIENT COMPLIANCE  
WITH MEDICATION REGIMENS

---

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  
GRACE ANN WALKER, B.S.N.

---

DENTON, TEXAS

AUGUST 1980

## ACKNOWLEDGMENTS

Deepest appreciation is extended to my parents, sisters, and dear friends for their encouragement and support throughout my graduate studies. Special thanks also go to my committee members, Donna Vokaty, Carol Adamson, and Susan Tollett.

Acknowledgment is extended to Dr. Wayne Keller for his support and for allowing me to include his patients in my study. Appreciation is also extended to the nursing staff at the agency for their help in coordinating this study.

I would also like to thank my typist, Rosa Lee Bachtel, for her expertise and many hours spent in preparation of my thesis.



## TABLE OF CONTENTS

ACKNOWLEDGMENTS . . . . .	iii
LIST OF TABLES . . . . .	vi
CHAPTER	
1. INTRODUCTION . . . . .	1
Statement of the Problem . . . . .	2
Statement of Purpose . . . . .	3
Background and Significance . . . . .	3
Hypothesis . . . . .	5
Definition of Terms . . . . .	5
Limitations . . . . .	6
Delimitations . . . . .	7
Assumptions . . . . .	8
Summary . . . . .	8
2. REVIEW OF THE LITERATURE . . . . .	10
Incidence of Medication Noncompliance . . . . .	10
Factors Which May Influence Compliance . . . . .	16
Effects of Teaching on Patient Compliance . . . . .	27
Summary . . . . .	35
3. PROCEDURE FOR COLLECTION AND TREATMENT OF DATA . . . . .	36
Setting . . . . .	36
Population . . . . .	36
Tools . . . . .	37
Data Collection . . . . .	40
Treatment of Data . . . . .	43
4. ANALYSIS AND INTERPRETATION OF DATA . . . . .	44
Description of the Sample . . . . .	45
Presentation of Findings . . . . .	45
Statistical Analysis of Data . . . . .	48
Discussion of Findings . . . . .	50
Summary of Findings . . . . .	51

## CHAPTER

5. SUMMARY, CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS . . . . .	53
Summary . . . . .	53
Conclusions . . . . .	54
Implications . . . . .	55
Recommendations . . . . .	56
APPENDIX A: SAMPLE OF A MEDICATION TEACHING FLYER . .	57
APPENDIX B: INTERVIEW SCHEDULE . . . . .	60
APPENDIX C: PILL COUNT FORM . . . . .	62
REFERENCES . . . . .	64

## LIST OF TABLES

### Table

1. Percentages of Medication Compliance, Group A--Experimental Group and Group B--Control Group . . . . .	47
2. Comparison of 100% Compliance Rates Between Groups, Group A--Experimental Group and Group B--Control Group . . . . .	48
3. Comparison of Standard Deviations and Intervals Between Groups, Group A--Experimental Group and Group B--Control Group . . . . .	49
4. Analysis of Variance in Medication Compliance Rates Between Groups, Group A--Experimental Group and Group B--Control Group . . . . .	50

## CHAPTER 1

### INTRODUCTION

Every year thousands of psychiatric patients show significant improvement with the use of psychopharmacological agents and are discharged from hospitals with the recommendations that maintenance dosages be continued (Mason, Forrest, Forrest, & Butler, 1963). After hospital discharge, patients frequently stop taking their medications or fail to take them as prescribed. As a result of their noncompliance with medication therapy, many patients relapse and require rehospitalization (Kline & Davis, 1973).

A large amount of time, effort, and expense is used in the study of the effects of drugs; however, little attention is devoted to whether or not patients take them as directed. Noncompliance has been observed in the treatment of a wide variety of illnesses and diseases. It is estimated that complete failure to take medication occurs in one-fourth to more than one-half of all outpatients. It has been observed that patients with chronic conditions are clearly prone to lapses in compliance especially when the treatment is prophylactic or suppressive, when the condition is mild or asymptomatic, or when the consequences of stopping therapy

may be delayed. Psychiatric patients particularly are problematic because the illness itself may erode the patient's capacity to cooperate (Blackwell, 1973).

Mason et al. (1963) believed that only a very small percentage of patients relapse while complying with prescribed drug therapy, and that rehospitalization can be prevented if patients comply with their medication programs. Problems of noncompliance reflect a general lack of positive information regarding the use of psychotropic medication. O'Brien (1979) stated that psychiatric patients who are provided with planned educational experiences are able to comply with prescribed treatment programs more adequately than those who are not offered comparable experiences.

#### Statement of the Problem

A high percentage of psychiatric patients discontinue taking their psychotropic medications after hospital discharge. Reasons given for discontinuing medication therapy reflect a lack of positive information regarding the use of psychotropic medication. Although patient teaching is believed to be a strong factor in increasing compliance, few studies have examined the relationship between patient teaching and compliance in a psychiatric outpatient population. Because patient teaching is an integral part of

nursing practice, this psychotropic medication compliance study has importance for the nursing profession.

#### Statement of Purpose

The purpose of this study was to determine if there was a relationship between knowledge of medication and medication compliance in psychiatric patients who were prescribed psychotropic drugs.

#### Background and Significance

Compliance with medical recommendations is considered to be essential if treatment of illness is to be effective (Lowe, 1970). Patient noncompliance with prescribed medication regimens continues to be a prevalent problem despite recognition and documentation. Davis (1966) estimated that approximately 30% to 35% of patients fail to follow medical recommendations prescribed by their doctors. Errors most frequently cited related to dosage, frequency of administration, and drug identification (Gabriel, Gagnon, & Bryan, 1977). Blackwell (1973) stated that patients' compliance with their medical regimens depends on a variety of factors that may change with time. These factors may include the patients' illnesses, features of the medications and regimens, the patients' relationships with their physicians, as well as the physiologic, demographic, sociologic, and psychological factors (Davis, 1968).

Psychiatric patients who are symptom-free often think there is no need to continue taking medication, and consequently do not comply with their prescribed medication programs. These patients frequently experience anxiety, fear, and resistance to taking medication for prolonged periods of time. Nurses are believed to be influential in helping psychiatric patients to follow prescribed medication programs. Through patient teaching, the nurse can help patients to understand their fears, anxieties, and resistances to taking their medications (Kline & Davis, 1973). There is evidence that patients' knowledge of their illnesses is related to their propensity to accept medical recommendations for prolonged time periods (Hecht, 1974).

Hecht (1974) theorized that beliefs and knowledge about health can influence health behavior. With increased knowledge about health and illness, it is possible to promote, to maintain, or to modify health related behaviors. Increasing the patients' knowledge about their health can be accomplished by patient teaching. One of the objectives of patient teaching is to allow patients to participate in planning their care and to integrate the illnesses in their life experiences in order to prevent regression or relapse (Redman, 1972). The ultimate goal of patient teaching is the achievement or maintenance of optimum states of health.

The immediate goal of patient teaching is to change health related behavior (Lowe, 1970).

Patient education should help patients understand their illnesses as well as identify measures they must take to conserve health and control symptoms of their illnesses (Redman, 1972). Increased knowledge about their illnesses and the treatment programs is believed to help patients accept medical advice and comply with recommendations for prolonged supervised medical care (Hecht, 1974).

#### Hypothesis

The hypothesis for this study was:

Psychiatric patients who receive patient teaching will demonstrate more posthospital compliance with their medication regimens than those who do not receive patient teaching.

#### Definition of Terms

Definition of terms for this study included the following:

1. Compliance: Patients carried out specific orders from their doctors with regard to their medication programs. This included taking the prescribed drug in the prescribed dosage at the prescribed times, as measured by pill counts.



2. Patient teaching: The investigator did the following:  
(1) discussed with the patients their needs for chemotherapy; (2) discussed with the patients how their particular psychotropic drugs are generally used; (3) gave the patients information about their prescribed medications which included the name of the drugs, their appearance, prescribed doses, possible side effects, and special precautions that may need to be observed while taking the medications; (4) corrected any misinformation the patients may have had; and (5) reinforced what the patients already knew about their prescribed medication regimens.
3. Psychiatric patients: Male or female persons who were hospitalized for a psychiatric illness.

#### Limitations

The following were limitations recognized by the investigator:

1. Data reflected only two weeks of study, therefore compliance over a longer period of time could not be assumed.
2. Both the control and experimental groups may have been contaminated with intervening instructions by nursing personnel and physicians.

3. The following variables were recognized as influences in patients' learning capabilities: educational backgrounds, intellectual levels, and cultural variations. The investigator did not control these variables because of the limited sample available.
4. It was impossible for the investigator to control patient motivation.
5. The complexity of the medication regimens was recognized as a variable. Patients with more complex regimens are less likely to comply with recommendations than patients with less complex regimens. The investigator did not control this variable due to the limited sample available.
6. Although some studies have described significant relationships between age and compliance, the investigator did not control this variable. However, all subjects were at least 18 years of age.
7. A final limitation recognized was that of limited sample size.

#### Delimitations

The focus of this study was limited to the effect of teaching on psychiatric patients' compliance with their psychotropic medication regimens. Other factors which may influence medication compliance were not investigated.

### Assumptions

The following assumptions were made for the purpose of this study:

1. Every individual has some capacity to learn.
2. Psychiatric patients have learning needs.
3. Knowledge results in behavioral changes.
4. Compliance with prescribed medication regimens is a guide that learning has taken place.
5. Participants answered honestly the interview questions.
6. Patient teaching is essential to responsible nursing practice.
7. The pill counts were reliable indicators of psychotropic medication compliance.

### Summary

The purpose of this study was to determine if there was a relationship between knowledge of medication and medication compliance in psychiatric outpatients who were prescribed psychotropic drugs. The following chapters contain the methodology used for collection and treatment of data, statistical analysis and interpretation of data, and a concluding chapter.

In this thesis, Chapter 1 contained the introduction. Chapter 2 contains a review of pertinent literature. Chapter 3 deals with the methodology of collection and

treatment of data. Analysis and interpretation of data are described in Chapter 4. Chapter 5, the final chapter, contains the summary, conclusions, implications, and recommendations.

## CHAPTER 2

### REVIEW OF THE LITERATURE

In this chapter, the literature is reviewed and reported. In order to better understand the complex subject of patient compliance with medication regimens, the chapter is organized into the following sections:

(1) incidence of medication noncompliance, (2) factors which may influence compliance, and (3) effects of teaching on compliance.

#### Incidence of Medication Noncompliance

Patient noncompliance with prescribed medication regimens continues to be a prevalent problem despite recognition and documentation. Davis (1966) estimated that approximately 30% to 35% of patients fail to follow medical recommendations prescribed by their doctors.

Mohler, Wallin, and Dreyfus (1955) studied 245 patients to determine the completeness with which oral penicillin was taken by patients treated in their homes. The patients were treated with oral penicillin for acute pharyngitis or otitis media due to streptococcus. Approximately 66% of the patients took penicillin as prescribed; 34% admitted taking less than the prescribed amount.

Penicillin was taken by 56% of the patients for less than five days with an average of four days (Mohler et al., 1955).

Bergman and Werner (1963) reported similar results from their study of pediatric patients who were treated with 10-day courses of penicillin. They found that 56% of the patients had stopped taking the medication by their third day, 71% by the sixth day, and 82% by the ninth day. Eighty-three percent of the childrens' parents claimed their children were taking penicillin; however, 92% of the urine samples showed no antibiotic activity.

Charney, Bynum, Eldredge, Frank, MacWhinney, McNabb, Scheiner, Sumpter, and Iker (1967) also reported similar results in their study of 459 children who were prescribed 10-day courses of penicillin. Only 56% of the patients completed the 10-day courses of penicillin therapy. Some penicillin had been taken by 13% of the patients, but not in the last 15 hours. On the fifth day of treatment, 81% were taking penicillin and on the ninth day, 56% were taking penicillin. Of the 459 patients, 13% were erratic takers of their medications.

Leistyna and Macaulay (1966) found, in their study of 162 private pediatric patients, that of the 144 patients (89%) who received what the investigators considered

adequate oral penicillin for streptococcal pharyngitis, all had negative follow-up throat cultures. Eighteen patients (11%) did not receive adequate oral penicillin. Of the 18, eight had positive follow-up throat cultures (Leistyna & Macaulay, 1966).

In his study of chronic tuberculosis therapy, Ireland (1960) reported a progressive increase each month in the number of patients exhibiting noncompliance with their prescribed drug therapies. Ireland studied 264 tubercular patients. At six months, 33% were taking no medication or less than the prescribed amount; 20% were taking no medication at all. At 12 months, 43% were taking no medication or less than the prescribed amount; 26% were taking no medication at all. At the end of two years, only one quarter of the patients who were prescribed medication were taking within 90% of their regimens as ordered. The results indicated an attrition rate of 1.3% to 2.5% per month after discharge.

Of the 122 tubercular patients studied by Moulding, Onstad, and Sbarbaro (1970), 31% took less than 70% of their prescribed medication. Of the 61 tubercular patients studied by Pitman, Benzier, and Katz (1959), 48% admitted taking their medications irregularly or not at all. Fox (1958) also reported similar results. He studied 79 tubercular patients

and determined that of the 58 patients completing a year of drug treatment, 20% had at least one negative result each month from an average of five urine tests for PAS. Luntz and Austin (1960) reported a compliance rate of 82% during the first year of chronic chemotherapy for discharged tubercular patients and only a 34% rate after four years of treatment. This is an increase of noncompliance from 18% at one year to 66% at four years (Luntz & Austin, 1960).

Roth and Berger (1960) studied 160 patients with gastrointestinal diseases. Patients were given antacids labeled with bromide. The investigators reported that the correspondence between bottle counts and blood bromide levels showed an error rate of up to 36% between the two measures. They also found that ulcer patients took approximately 42% of their prescribed medication while non-ulcer patients took approximately 63% of their prescribed medication.

Bonnar, Goldberg, and Smith (1969) studied 60 pregnant women from early pregnancy to term to determine their compliance with taking iron. Each patient was given a blood test to determine hemoglobin levels. Of those patients who had hemoglobin levels higher than 12 mg/100 ml at term, 86% had stool tests which were positive for iron. Of those patients with less than 12 mg/100 ml, which is considered



iron deficiency anemia, only 25% had stool tests which were positive for iron.

Willcox, Hare, and Gillan (1965) utilized urine tests in order to detect levels of medication in the urine of 125 psychiatric patients. Overall, 33% to 59% failed to take their medication as prescribed.

Forty-two neurotically depressed patients were studied by Lipman, Rickels, Eberhard, Park, and Fisher (1965) at Johns Hopkins Hospital. The patients were seen four times in biweekly interviews. During the interviews, patients were asked if they had taken the prescribed number of pills. If any deviation was reported, the patients were asked to estimate the number of pills missed. Pills were also counted during the interviews; 51% of the patients had more pills than they should. In 40% of the cases, there was a discrepancy between the patient's report of a deviation and pill count index of deviation. These pill counts revealed a much higher percentage of deviation (51%) than patients' reports (15%).

Renton, Affleck, Carstairs, and Forrest (1963) studied 124 schizophrenic patients who were prescribed a variety of psychotropic medications. It was determined that 46% of the patients were not taking their medications as prescribed.

Fifty-nine patients were studied by Neeley and Patrick (1968) to determine if patients who were 60 years of age and

over, lived at home, and were under private medical care took their medications as prescribed. Of the 41 respondents, 41% made no errors and 59% made some errors. The mean number of errors was 2.3 per person. Of the errors made, 48% were omission errors; 34% were due to inaccurate knowledge about the medication; 15% related to self-medication; 2% to improper timing and sequence; and 1% to incorrect dosage (Neeley & Patrick, 1968).

In a study of 357 patients with diabetes mellitus and/or congestive heart failure, Hulka, Cassel, Kupper, and Burdette (1976) found patients making four types of medication errors. Of these errors, 19% were due to omission of medication; 19% were due to commissions; 17% were due to scheduling misconceptions; and 3% were due to scheduling noncompliance. The combined error rate was 58%.

Types of medication errors seem to follow a similar pattern. The most frequent are errors of omission, with inappropriate self-medication occurring about one third to one half as often as other types of errors. Incorrect dosage, improper timing, and inaccurate knowledge of purpose are three additional errors which occur frequently (Schwartz, 1975). In a study at Peter Bent Brigham Hospital, 50% of the patients used medication incorrectly (Fox, 1969).

Hammel and Williams (1964) reported that, out of 2,000 prescription orders, 3% were not filled within 10 days. Rickels and Briscoe (1970) found that only 65% of patients who returned for their two week follow-up visits and medication counts returned for their four week follow-up visits. Brook, Appel, Avery, Orman, and Stevenson (1971) determined from their study of in-patient follow-up care that 33% of the 268 patients studied had stopped taking the medication that was directly related to the major reasons for their hospitalizations.

#### Factors Which May Influence Compliance

Patients' compliance with their medication regimens depends on a variety of factors. These factors may include the patients' illnesses, the patients' relationships with their physicians, features of the medications and regimens, as well as demographic, physiologic, sociologic, and psychological factors (Davis, 1968). In this section, factors which may influence compliance are reviewed.

#### Demographic Variables

Age. Many investigations revealed that age does not seem to be significantly related to compliance (Donabedian & Rosenfeld, 1963; Maddock, 1967; Willcox et al, 1965; Charney et al., 1967; Neeley & Patrick, 1968; Roth & Berger,

1960; Davis, 1966, 1967; Pragoff, 1962). In contrast, Davis and Eichhorn (1963) reported that different age groups exhibited variations related to changes in compliance. They discovered that persons under 45 years of age were more likely to continue compliance compared to those over the age of 45. The middle aged group (46-65 years) was found to be the least likely to continue compliance, and the most likely to stop compliance if they started at all. Bergman and Werner (1963) and Luntz and Austin (1960) reported that younger patients were less likely to comply with prescribed medication regimens than were older patients. Dixon, Stradling, and Wootton (1957) found that women with tuberculosis under 30 years of age were consistently reluctant to take prescribed PAS.

Sex. The results of many investigations have revealed that there was no significant relationship between sex and compliance with medication regimens (Donabedian & Rosenfeld, 1963; Maddock, 1967; Willcox et al., 1965; Neeley & Patrick, 1968; Davis, 1966, 1968). Several investigators reported women were more likely to discontinue their medications compared to men (Dixon et al., 1957; Luntz & Austin, 1960; Morrow & Rabin, 1966; Wynn-Williams & Arris, 1958). Dixon et al. (1957) found the percentage of young women (under 30) making medication errors was usually double that of men.

Marital status. Schwartz, Wang, Zeitz, and Goss (1962) found that proportionately fewer single and married patients made errors than did those who were separated, divorced, or widowed. Errors were made most frequently by those patients whose marital status had changed. The frequency of any kind of error was lowest for single persons. Errors increased in frequency respectively for married persons, widowed persons, and persons who were divorced or separated. Medication errors were higher among persons living alone compared with persons living with others (Schwartz et al., 1962). Morrow and Rabin (1966) also determined that married patients were more compliant than patients who were divorced or separated. In contrast, other investigators have reported that there was no significant relationship between marital status and compliance (Donabedian & Rosenfeld, 1963; Willcox et al., 1965; Maddock, 1967; Morrow & Rabin, 1966; Neeley & Patrick, 1968; Davis, 1966).

Socioeconomic status. The results of many studies have led to the conclusion that socioeconomic status was not related to compliance (Donabedian & Rosenfeld, 1963; Maddock, 1967; Morrow & Rabin, 1966; Ireland, 1960; Mohler et al., 1955; Neeley & Patrick, 1968; Davis, 1966; Francis, Korsch, & Gozzi, 1964; Heinzelmann, 1962). Conversely, several other studies indicated that socioeconomic status was a significant

factor (Willcox et al., 1965; Davis, 1968; Schwartz et al., 1962). In a study conducted by Lipman et al. (1965) a clear relationship between socioeconomic status and compliance was evidenced. Compliance was associated with being a member of the middle class, well educated, and white.

Education. Results of many investigations revealed no significant relationship between level of education and compliance (Donabedian & Rosenfeld, 1963; Charney et al., 1967; Neeley & Patrick, 1968; Davis, 1966, 1967; Francis et al., 1964; Heinzelmann, 1962). Schwartz et al. (1962) found that persons with more education made fewer errors than the less educated. Davis and Eichhorn (1963) reported the opposite--as the level of education increased, so did noncompliance.

Religion. Few studies have examined the relationship between religion and compliance (Marston, 1970). Davis (1966) and Morrow and Rabin (1966) determined no significant relationship between religion and compliance. Johnson (1965) found that Protestants exhibited a higher degree of compliance compared to persons from other religions. Schwartz et al. (1962) reported that Catholics made more errors than other religious groups, followed by Protestants, then Jews.

#### Psychological Variables

Attitudes. Davis (1968) reported that there were psychological factors which were related to attitudinal and

behavioral aspects of compliance. He hypothesized that knowing patients' attitudes toward their illnesses and their abilities to cope may contribute to an understanding of their compliance or noncompliance. In his study, Davis examined two factors: sociomedical attitudes and patients' personality traits. None of the attitudinal factors studied were significantly related with compliance variations. The only significant relationship was between attitudinal and behavioral compliance. Positive and negative attitudes toward science, illness, and physicians appeared to be unrelated to compliance.

Patients characterized as "responsive, cooperative, and grateful" were reported to be more likely to express positive attitudes regarding compliance and were also more likely to comply with their doctors' advice. Patients who were considered articulate, intelligent, and formal positively related to behavioral compliance. Patients characterized as "authoritarian, demanding, and overbearing" showed lower compliance rates (Davis, 1968).

Bakker and Dightman (1964) studied women who took oral contraceptives. The women were given a battery of personality tests. Results showed that women who failed to take their medication regularly were more immature, irresponsible, and impulsive. The researchers also reported that the

personality profiles of these women deviated more from their husbands' profiles than did those women who took their medication regularly.

Richards (1964) studied attitudes of 30 schizophrenic patients. He used Osgood's Semantic Differential Rating Scale to determine the attitudes of the 30 patients who were either known acceptors or refusers of medication. The group of extreme refusers rated medicine less favorably than did the more compliant patients. They also held unfavorable attitudes toward authority.

A group of 37 extremely noncompliant patients were studied at a Veteran's Administration Hospital. The deviators exhibited more overt hostility and angry feelings than the compliant patients. They also expressed angry feelings toward psychotherapy (Blackwell, 1972).

Doctor-patient relationship. According to Davis and Eichhorn (1963), another factor that may influence compliance is the doctor-patient relationship. The decision to comply with the doctor's orders may be influenced by the interaction between the doctor and the patient. Davis and Eichhorn hypothesized that as the relationships between doctors and patients become less formal, strains may develop that interfere with their role functions. This makes it easier for patients to ignore the regimens prescribed by



their doctors. In absence of this authority, patients may turn to others for advice. This situation makes the relationship between doctors and patients less distinguishable from the relationships patients have with their families or friends. It is possible that the influences of these persons may conflict with the doctor's advice. However, there is also the possibility that family and friends will reinforce the doctor's recommendations.

Francis et al. (1964) investigated the doctor-patient relationship in a pediatric outpatient department. They reported that compliance was lowered if the mother perceived the doctor as unfriendly and if she felt that he did not understand the complaint. Those who were highly satisfied with the initial contact showed a high compliance rate (53%). Of those who were highly dissatisfied, only 17% showed compliance with the prescribed regimens.

In their study of pediatric patient compliance with penicillin therapy, Charney et al. (1967) found that compliance rates were higher when children were seen by a familiar doctor rather than by one of the doctor's associates. They also found that compliance was positively related to the number of years the doctor had cared for the family.

In a study at a Veteran's Administration Hospital, patients were prescribed medications by one doctor but attended psychotherapy with another. Verbal resistance expressed to the therapist concerning medication was found to be significantly correlated with noncompliance (Blackwell, 1972).

Irwin, Weitzel, and Morgan (1971) found that 39% of outpatient schizophrenics did not comply with their medication regimens if they were treated by a doctor who did not believe drugs were a necessary part of treatment; compared to 25% of those cared for by a doctor who viewed medication as essential. It should be noted that the sample was small and the difference not significant.

### Illness Variables

Davis (1968) hypothesized that the seriousness of the illness might differentiate patients who are compliant from those who are noncompliant. Most doctors reported that patients with severe illnesses were more likely to follow their prescribed regimens than those with less severe illnesses. Surprisingly, the results of Davis' study showed that patients with less severe illnesses were more likely to follow their doctors' advice than those with more severe illnesses. Patients with severe illnesses were found to have "good intentions" but failed to comply.

Patients with chronic or prolonged illnesses were reported to be more prone to lapses in compliance than patients who had illnesses with shorter durations or when relapses were immediate or severe. Noncompliance was noted in patients with prolonged illnesses, especially when the illness was mild or asymptomatic, prophylactic treatment was given, or when the consequences of stopping the medication therapy were delayed. Patients who potentially could have an immediate or severe relapse were more likely to comply (Blackwell, 1972).

Psychiatric patients may be particularly problematic because the illness itself may prevent patients from cooperating with prescribed regimens (Blackwell, 1972). Renton et al. (1963) determined that noncompliance rates were highest in schizophrenics who were most ill at the time of hospital discharge. It was difficult for the researchers to determine whether noncompliance was the cause or result of further deterioration. Patients who were less ill attended outpatient clinics more faithfully and were more compliant in following their medication regimens.

Poor compliance has been exhibited not only by psychotic patients whose insight may be impaired, but also in neurotic illnesses. Lipman et al. (1965) studied neurotically anxious outpatients and found that noncompliance

was highest among the most anxious patients who had been given a poorer prognosis.

Willcox et al. (1965) studied psychiatric outpatients and found the highest noncompliance rate was among depressed patients treated with chlorpromazine. Of this group, 70% were noncompliant, compared to 32% of schizophrenics given chlorpromazine and 44% of depressed patients given imipramine.

Bergman and Werner (1963) concluded that parents stopped giving medications to their children when the symptoms ceased and they no longer felt the medication was necessary. Sumner and Meunier (1970) found that of 17 patients who did not take their entire courses of Tetracycline HCL, 13 reported that they discontinued because their health had improved. Mohler et al. (1955) also determined that the most frequent reason given for not taking a full course of penicillin therapy was that the patient felt well after one to two days of therapy and thought continuation of the drug was unnecessary. Schwartz et al. (1962) as well as Charney et al. (1967) reported that mothers who perceived their children's illnesses as severe were more likely to be compliant.

Another factor studied was the extent to which the illness interfered with the patient performing daily

activities. The greater the effect of the illness on performing daily activities, the less likely was the patient willing to follow the doctor's advice. Patients indicated that they were more willing to follow the doctor's advice when they had a physical disability. Although 90% said they would comply with their doctor's advice, only 44% actually did (Davis, 1968).

#### Medication Regimen

Complexity. Medication regimens may vary in the degree of complexity depending on patients and their illnesses. Francis et al. (1964) reported that compliance by pediatric outpatients declined if three or more medications were prescribed. Compliance also declined if two separate treatment methods were initiated at the same time. Schwartz et al. (1962) reported that errors increased for up to three medications but not above three. Malahy (1966) reported that the number of medications taken by patients significantly correlated with noncompliance.

As the number of doses of a drug increase, so does noncompliance (Willcox et al., 1965; Porter, 1969; Gatley, 1968). In his study of pregnant women, Porter (1969) reported that women were more compliant when prescribed iron to be taken once a day rather than a divided regimen. Gatley (1968) reported that the incidence of noncompliance

doubled when the number of pills was increased from one to four.

Side effects of medication. Side effects from prescribed medication have been significantly correlated with noncompliance. Marshall (1971) reported two main reasons why psychiatric patients avoid taking medication. They are: (1) impotence as a side effect from psychotropic medication, and (2) alcohol and sociability. Patients are often instructed to not drink alcohol while taking medication. As a result, their social activities may be influenced (Marshall, 1971). Park and Lipman (1964) reported that side effects were experienced by seven of 55 schizophrenics who stopped taking medication after hospital discharge. Renton et al. (1963) reported that side effects, particularly sedation, were experienced by psychiatric patients who stopped taking their medications. Patients frequently stated that side effects were a major reason for stopping medication therapy, especially if they were unsuspected or alarming (Blackwell, 1972).

#### Effects of Teaching on Patient Compliance

Inadequate programs to teach patients about their medications prior to hospital discharge are thought to be a major cause of patient noncompliance with prescribed drug regimens. D'Altroy, Blissenbach, and Lutz (1978) identified

five problems they found to be related to drug use that could be corrected by implementing a medication teaching program. They are: (1) patient noncompliance with prescribed medication regimens after hospital discharge, (2) prior to hospital discharge, hospital staff members frequently find it difficult to judge patients' capabilities to comply with their medication regimens, (3) patients often do not use good judgment in managing their regimens due to lack of independence, confidence, or knowledge, (4) most patients learn how to take their medications at home where they may receive incorrect information and feedback from nonprofessionals, and (5) discharge planning is often conducted too late in the patient's stay to allow them adequate time to learn about their medication regimens and ask questions.

Psychologists have documented that reinforcement is a vital factor in affecting the degree of learning. This implies that the greater the time and effort spent educating patients about their illnesses and medication therapies, the greater the chances that they will follow discharge instructions correctly (Romankiewicz, Gotz, Capelli, & Carlin, 1978).

### Patient Teaching Programs

New York Hospital staff developed a drug information program to help improve patient compliance with prescribed medication regimens. The drug information service of the pharmacy developed instruction cards for individual drugs. These cards were wallet size which enabled patients to carry the information with them. Patients were asked to read the information cards while in the hospital. A nurse or pharmacist spent time with the patients emphasizing the importance of taking medications as prescribed, observing the listed precautions, and reporting any adverse effects to their physicians. Evaluation of the instruction cards showed that the cards were useful in improving patient knowledge. No statistics were cited regarding the rate of medication compliance (Romankiewicz et al., 1978).

Malahy (1966) studied 40 patients in an effort to show that if patients are taught about their medications and have their drugs labeled with the drug names, they would make fewer medication errors. The results of her study did not support her hypothesis. Medication errors were made by 90% of the patients. The greatest number of errors were made in the timing or sequence of taking the medication. The second most frequent error was in the purpose for taking the medication. Patients who knew the purpose of the



medication made approximately 10% fewer errors than those who did not know the purpose.

Sharpe and Mikeal (1975) determined that patients who were given written information about their medications were significantly more compliant than those who did not receive information. In another study, pharmacists provided both verbal and written information to experimental patients about their medications. When the experimental and control groups were compared, only 3.4% of the experimental group compared to 29% of the control group discontinued their medications before the prescribed times (Sharpe & Mikeal, 1975).

Hladik and White (1976) studied 50 cardiac patients to determine the effects of teaching patients about their medications. Patients received teaching from a nurse which included written reinforcements about their particular medications. All of the patients were questioned one month after hospital discharge to assess the patients' knowledge about their medications and their usage of medication information. Of these patients, 49% indicated they had read the material after leaving the hospital and many claimed to have read it more than once; 63% named their medications correctly.

Clark and Bayley (1972) studied 45 patients taking Warfarin who received various teaching modalities. The

researchers developed programmed instructions to be used as a teaching tool by patients prior to hospital discharge. The content of the instructions included the following: (1) action of the medication, (2) effects of the medication, and (3) administration instructions. The subjects were divided into three groups. Group 1 received instruction booklets; group 2 received a two-page handout, and group 3 received no information. Twenty-four to 72 hours after receiving the information, the subjects were tested in order to ascertain their levels of knowledge about their medications. Group 1 had the highest mean scores, and group 3 had the lowest scores. This indicated that the more extensive the teaching, the greater the patient understanding.

A survey conducted at Seattle Public Health Service Hospital revealed that 60% of the outpatients were unaware of special precautions that may need to be observed while taking medications. This included the proper administration, possible side effects, other agents to avoid when taking certain medications, adjuncts to therapy, and special instructions concerning individual medication. One month after instituting the teaching program, there was a marked increase in patient awareness about their medications. There was an increase of 32% in the number of patients aware

of special precautions. Of those patients who had taken medication previously, 88% were aware of special precautions. This was an increase of 48% above the figures obtained before the project began (Fox, 1969).

Ley, Jain, and Skilbeck (1976) studied the effects of drug information leaflets for antidepressants and tranquilizers. The leaflets varied in reading difficulty. Twenty patients were given an easy, moderate, or difficult-to-read pamphlet along with a sticker for the medication container with dosage information. Results showed a higher compliance rate associated with easier-to-read leaflets.

Sackett, Gibson, Taylor, Haynes, Hackett, Roberts, and Johnson (1975) studied 230 steelworkers with hypertension to determine if compliance with antihypertension drug regimens could be improved. Some of the subjects were treated by the doctor at the factory where the subjects worked. They also received an educational program. The other subjects were treated by their own physicians and did not receive any special educational program. Results of the study showed that compliance was not improved by attempting to make follow-up care more convenient. It also showed that mastery learning did not increase compliance.

Pill calendars have been used as an aid in increasing patient compliance with medication regimens. Moulding

(1961) attached pills to a calendar and gave the calendar to the patients. Thirteen of the 29 subjects studied had no forgotten pills attached to the calendar at the end of the three month study. The medication calendar was considered to be beneficial to illiterate people, and also improved the regularity of self-administered medication.

Liberman and Schwartz (1972) created a patient calendar sheet which included the date, time, drug to be taken, and the dosage. Patients were instructed to check off the space whenever they took a dose. Doses to be skipped were marked off in advance. Compliance rates were not reported; however, it was believed that the calendar sheet increased compliance.

Sclafani (1977) employed a systematic teaching plan for psychiatric outpatients. Outpatients were pretested about medications, a film was shown about what medications should have been taken, and then a nurse worked with group members to discuss medications, dispell misinformation, and answer questions. At a second session, patients were given medication literature and individual counseling. Compliance rates were not reported.

#### Need for Patient Teaching

According to Redman (1972), every person who receives health care has some need to learn. With the increased use

of pharmacological therapies for outpatients, more persons are being given the responsibility for their own care. The American Society of Hospital Pharmacists suggested the following points concerning medications be considered essential for patients: (1) drug, trade, and generic names, (2) expected actions and intended uses of the drug, (3) precaution to not share medications, (4) possible side effects which may be minor or serious, (5) techniques for self-monitoring, (6) interactions between drugs, (7) refill information, and (8) storage information (Reinders, 1978). Inadequate programs to teach patients about their medications or lack of programs are thought to be a major cause of patient noncompliance with prescribed medication regimens (Romankiewicz et al., 1978).

#### Responsibility of Patient Teaching

Since self-medication is widely practiced by most patients, health professionals need to assume the responsibility of actively advising patients concerning their medications. By advising patients about their medications, this enables them to gain the maximum benefit from drug therapy (Fox, 1969).

Theoretically, nurses have always been expected to provide patient teaching. Historically, patient education in hospital settings has been unstructured, casual, and

inconsistent. Nursing service organizations have recently been stimulated to formalize this educational process by structuring patient education programs (DelBueno, 1978).

Patient teaching is not a new role for the nurse, however. In 1952, the World Health Organization Expert Committee on Nursing stated that the "nurse is a teacher of health" (World Health Organization, 1952). Today, the American Nurses' Association regards patient teaching as an integral part of nursing practice (American Nurses' Association, 1973).

#### Summary

The review of the literature revealed that medication noncompliance occurs with high frequency among all out-patient populations. Many methods were employed to identify medication noncompliance. These included pill counts, patient reports, urine excretion tests, and patient observations. A variety of factors appear to influence medication compliance which include: (1) the doctor-patient relationship, (2) complexity of the medication regimen, (3) the patient's illness, and (4) knowledge about medications. With medication noncompliance occurring frequently, it is essential for nurses to take an active role in teaching patients about their medications to help decrease noncompliance with medication regimens.

## CHAPTER 3

### PROCEDURE FOR COLLECTION AND TREATMENT OF DATA

In this chapter, the procedure for collection and treatment of data is presented. For reporting purposes, the chapter is organized into the following sections: (1) setting, (2) population, (3) tools, (4) data collection, and (5) treatment of data.

#### Setting

The study was conducted in a 500-bed privately owned hospital located in a city of approximately 1.8 million persons in southwestern United States. The hospital is a teaching hospital and has affiliations with several nursing schools. Subjects were selected from the hospital's 15-bed psychiatric unit. Patient teaching was conducted in a private conference room located within the psychiatric unit. The follow-up interviews were also conducted in the same conference room.

#### Population

The population of this study consisted of 18 hospitalized psychiatric patients. The following criteria were used in the selection of subjects:

1. Subjects were diagnosed with psychiatric illnesses.
2. Subjects were on medication regimens with at least one psychotropic drug prescribed to be taken on a routine basis.
3. Subjects who were prescribed medications in addition to their psychotropic drugs or were prescribed more than one psychotropic drug were not excluded.
4. Only English speaking patients were selected to ensure adequate communication between patients and the investigator.
5. Subjects were selected only with the permission of the attending physician.
6. Subjects were at least 18 years of age.
7. Subjects were nonpsychotic at the time of patient teaching.

### Tools

Three tools were used in this study. These tools included: (1) medication teaching flyers (Appendix A) for each psychotropic drug that the experimental group subjects were prescribed, (2) structured follow-up interviews (Appendix B), and (3) pill counts (Appendix C).

### Medication Teaching Flyers

Pertinent literature was reviewed to acquaint the investigator with studies dealing with patient compliance



with medication regimens and patient teaching programs. Recommendations and teaching approaches cited in the literature review were influential in helping the investigator develop the medication teaching flyers. The investigator developed the flyers based on the design created by Ann Grant for Greystone Park Psychiatric Hospital (Sclafani, 1977).

The purpose of the medication teaching flyers was to inform experimental group subjects about their psychotropic medications and explain the necessity of taking their medications as prescribed. Subjects in the experimental group received medication teaching flyers which were specific to their psychotropic medications. The teaching flyers included the following information: (1) name of the drug, (2) appearance of the drug, (3) prescribed dose, (4) frequency of medication, (5) possible side effects, (6) special precautions that need to be observed while taking the medication, and (7) the importance of taking medication as prescribed.

Each medication teaching flyer was approximately two typed pages of "easy-to-read" information. In order to assure the validity of the information given to the subjects, the investigator obtained drug information from the Physicians' Desk Reference (1979) and inserts that were provided with the drugs from the manufacturers.

### Interview Schedule

An eight-item structured interview schedule was developed by the investigator (Appendix B). Open and closed questions were included in the interview. Subjects were asked what medications they were taking, the dosage and frequency of their medications, and whether side effects were occurring. If subjects stated they were experiencing side effects, they were asked what the side effects were. For background data, subjects were asked what their general levels of satisfaction with their regimens were and if they had complied with their medication regimens. If subjects stated that they had not complied with their regimens, they were asked to describe their noncompliance.

### Pill Counts

An instrument was developed by the investigator for the pill counts (Appendix C). Information on the form included: (1) date of patient's hospital discharge, (2) date of interview, (3) number of pills in the original prescription or the number of pills remaining since the first interview, (4) name of prescribed medication, (5) dosage, (6) frequency, and (7) number of pills remaining in the bottles at each interview. Pills were counted by the investigator during each interview. Calculations as to accuracy were made by counting the remaining tablets.

Data Collection

Approval from the Human Subjects Committee was obtained prior to initiating this study. The Director of Nursing was contacted by the researcher to obtain written permission to conduct the study at the selected facility. The attending physician was contacted to obtain written permission to include his patients in the study.

An experimental two-group design using a control group was designed to test the hypothesis that psychiatric patients who receive patient teaching will demonstrate more posthospital compliance with their medication regimens than those who do not receive patient teaching. A total of 18 subjects were chosen in accordance with predetermined criteria. Quota sampling was used to select the 18 subjects. The investigator flipped a coin in order to randomly assign the first patient to a group. Subject #1 was assigned to the control group. Subjects were alternated into the experimental and control groups as they became available. Nine patients were assigned to the experimental group (Group A) and nine patients were assigned to the control group (Group B).

All subjects were asked to sign a written consent form agreeing to participate in the study. Subjects were told that the purpose of the study was to obtain information

about the intake practices of prescribed medication. A guarantee of anonymity and confidentiality of information was offered to all participants. A double blind coding system was used to ensure anonymity of the participants. Participation in this study was totally voluntary. Subjects were told that they could withdraw from the study at any time.

After subjects consented to participate in the study, the researcher made appointments to meet with each subject prior to hospital discharge. During these meetings, subjects were instructed to ask their pharmacists to put the number of pills dispensed on the bottle label. Subjects were also instructed to count their pills upon receipt from the pharmacist to ensure they received the correct number of pills. Appointments were then made for subjects to attend the first interview after hospital discharge. Subjects were instructed to bring their bottles of pills prescribed by their psychiatrist to the interview.

The investigator scheduled appointments to meet with each of the experimental group subjects prior to hospital discharge. During these appointments, subjects received medication teaching flyers which were specific to their psychotropic medications (Appendix A). The investigator read the teaching flyers with the subjects. Subjects were

given the opportunity to ask questions about their medications and were encouraged to discuss any information they previously had regarding their medication regimens. Subjects were given the medication teaching flyers to keep for their own use. The investigator tried to schedule the teaching sessions several days prior to the patients' hospital discharges in order to give subjects time to synthesize the information and ask questions that might arise. The teaching sessions lasted approximately 20 minutes. The investigator met with experimental group subjects informally after teaching sessions to answer any further questions. Subjects in the control group did not receive any teaching from the investigator.

Control and experimental group subjects were interviewed twice after hospital discharge. The first interviews were conducted approximately seven days after hospital discharge. The second interviews were conducted approximately seven days after the first interviews. When possible, interviews were scheduled on the same date and near the same time as the patients' follow-up visits with their doctor. This was done in order to make interview appointments more convenient for subjects. During the first and second interviews, the investigator asked subjects the questions on the interview schedule (Appendix B)

and counted the remaining number of pills in the medication bottles. The investigator then tabulated the information and calculated compliance scores for each subject by dividing the number of pills taken by the number of pills prescribed.

#### Treatment of Data

A performance index was designed as a means of quantifying patient medication performance based on pill count data. Psychotropic medication compliance was computed by the researcher for each subject. Psychotropic medication compliance was not calculated for medication taken on an "as needed" basis.

Information was obtained from the two pill counts about the number of pills which were actually taken and the number of pills prescribed. The number of pills actually taken were divided by the number of pills prescribed. The scores for the experimental and control groups were listed and mean scores were compared. The statistical procedure used in the analysis of data was a two-way analysis of variance with repeated measures.

## CHAPTER 4

### ANALYSIS AND INTERPRETATION OF DATA

This experimental explanatory study was designed to determine if psychiatric patients who receive patient teaching will demonstrate more posthospital compliance with their medication regimens than those who do not receive patient teaching. The investigator provided medication instructions individually to the subjects in the experimental group (Group A). They were given medication teaching flyers which were specific to their psychotropic medications. Subjects read the teaching flyers with the investigator, and then were allowed to ask questions and encouraged to discuss information they may have previously acquired regarding their medications. Control group subjects (Group B) did not receive any patient teaching from the investigator. Two structured interviews and two pill counts, one week apart, were used to determine degrees of patient compliance with their medication regimens. Compliance scores were based on calculations obtained from the two pill counts. A two-way analysis of variance was used to examine the difference between the experimental and control groups' compliance scores.

### Description of the Sample

The study sample was composed of 18 psychiatric patients with a minimum age of 18 years. Subjects were divided into two groups, an experimental group and a control group. The experimental group (Group A) subjects were taught about their medications by the investigator. Subjects in the control group (Group B) did not receive any teaching from the investigator. The experimental group consisted of nine subjects. Four of the subjects were males and five were females. The control group also consisted of nine subjects. Two of the control group subjects were males and seven were females. Except for sex and race, no other demographic data were collected for this study. One subject was Black and 17 subjects were White. No Orientals participated in the study.

All of the individuals in the sample were hospitalized psychiatric patients diagnosed with psychiatric disorders. Although some patients received medication for other illnesses or conditions, only psychotropic medications prescribed by their psychiatrist were studied.

### Presentation of Findings

Psychotropic medication compliance was calculated twice for each subject after hospital discharge. Two pill counts were made approximately one week apart. Information was



obtained about the number of pills that should have been taken and the actual number of pills taken. Compliance scores were calculated by dividing the number of pills taken by the number of pills prescribed. For subjects who took more than the prescribed number of pills, the excess number was subtracted from the total prescribed, then divided by the total. This gave the percentage of medication compliance independent of the prescribed number of pills or frequency of dosages. Percentages of medication compliance are presented for Groups A and B in Table 1.

#### Medication Compliance

Experimental group--Group A. Based on pill count data, four subjects, 44.44% of the sample, complied with their medication regimens 100% during the first week after hospital discharge. Five subjects, 55.55% of the sample, had a 100% compliance rate one week after the first pill count. Three subjects, 33.33% of the sample, complied 100% for both pill counts.

Control group--Group B. Three subjects, 33.33% of the sample, had a 100% compliance rate one week after hospital discharge. Two subjects, 22.22% of the sample, complied with their medication regimens 100% one week after the first pill count. One subject, 11.11% of the sample, had a 100%

Table 1

Percentages of Medication Compliance, Group A--Experimental Group and Group B--Control Group

Subject #	<u>Group A Percentages</u>		<u>Group B Percentages</u>	
	Compliance Score #1	Compliance Score #2	Compliance Score #1	Compliance Score #2
1	100	100	88	84
2	88	72	76	43
3	100	100	100	100
4	92	100	83	87
5	78	91	100	65
6	86	72	86	72
7	95	100	86	100
8	100	100	100	75
9	100	93	43	83
Mean Scores	93.22	92.00	84.67	78.78

compliance rate for both pill counts. Table 2 presents a comparison of 100% compliance rates between the experimental and control groups.

#### Variance of Scores Between Groups

The mean compliance index for Group A after the first pill count was 93.22% while the Group B mean score was

Table 2

Comparison of 100% Compliance Rates Between Groups,  
Group A--Experimental Group and  
Group B--Control Group

Pill Counts	Group A Percentages	Group B Percentages
Pill Count #1	44.44	33.33
Pill Count #2	55.55	22.22
Both Counts	33.33	11.11

84.67%. The 95% confidence interval for Group A was estimated to be 85.98% to 100.46%. The 95% confidence interval for Group B was estimated to be 68.36% to 100.98%.

The mean compliance for Group A after the second pill count was 92% while the Group B mean was 78.78%. The 95% confidence interval for Group A was estimated to be 81.14% to 102.86%. The 95% confidence interval for Group B was estimated to be 62.43% to 95.13%. Standard deviations and confidence intervals for Groups A and B are presented in Table 3.

#### Statistical Analysis of Data

Compliance scores were subjected to a two-way analysis of variance with repeated measures. A statistical difference was found to exist between Group A and Group B at  $p = 0.05$ . This difference is statistically significant and

Table 3

Comparison of Standard Deviations and Intervals Between  
Groups, Group A--Experimental Group and  
Group B--Control Group

	Group A Percentages	Group B Percentages
<u>Compliance Score #1</u>		
Mean Score	93.22222	84.66667
Standard Deviation	7.90218	17.79747
95% Confidence Interval	85.98 - 100.46	68.36 - 100.98
<u>Compliance Score #2</u>		
Mean Score	92.00000	78.77778
Standard Deviation	11.84272	17.83100
95% Confidence Interval	81.14 - 102.86	62.43 - 95.13

therefore, it can be concluded that patients who were taught about their medications exhibited more posthospital compliance with their medication regimens than patients who did not receive patient teaching. No significant difference was found between compliance scores from one testing period to another as presented in Table 4. Since there was no significant difference between compliance scores from one testing period to another, it can be concluded that the

Table 4

Analysis of Variance in Medication Compliance Rates  
Between Groups, Group A--Experimental Group and  
Group B--Control Group

Source of Variation <sup>a</sup>	Sum of Squares	Degrees of Freedom	Mean Score	F	p
Mean	273529.00000	1	273529.00000	1093.87	0.00
G	1067.11110	1	1067.11110	4.27	0.05
Error	4000.88900	16	250.05556		
B	113.77780	1	113.77780	0.67	0.42
BG	49.00000	1	49.00000	0.29	0.59
Error	2698.22230	16	168.63889		

<sup>a</sup>G = main effect for group; B = main effect for time factor; BG = interaction between groups.

effect of teaching on experimental group subjects did not deteriorate with time. Also, the rate of compliance of the experimental and control group subjects did not significantly vary with time.

#### Discussion of Findings

Analysis of the data revealed that patients who were taught about their medications were significantly more compliant with their medication regimens than those who did not receive patient teaching. The results are comparable to

other studies that measured the relationships between patient teaching and patient compliance with medication regimens. According to Sharpe and Mikeal (1975), patients who were given written information about their medications were significantly more compliant than those who did not receive information. They also found that patients who received both written and verbal information about their medications exhibited a much higher compliance rate than those who received no special medication teaching. Hecht's study (1974) indicated that teaching reduced the number of medication errors in patients who were tested by urine tests, pill counts, and interviews. Clinite and Kabat (1976) reported that patients who received both verbal instruction and a printed information sheet exhibited a significantly higher compliance rate than patients who received only one mode of instruction or no instruction.

#### Summary of Findings

This explanatory study was undertaken to determine if psychiatric patients who receive patient teaching will demonstrate more posthospital compliance with their medication regimens than those who do not receive patient teaching. Pill counts were used to determine percentages of compliance with medication regimens. The sample was

selected from an inpatient psychiatric population who were prescribed psychotropic medications.

A two-way analysis of variance with repeated measures was used to determine differences between the experimental and control groups' compliance rates. Analysis of the data revealed that there was a significant difference at  $p = 0.05$  between the experimental and control groups' compliance scores. No significant difference was found between compliance scores from one testing period to another. It was concluded that patients who were taught about their medications exhibited more posthospital compliance with their medication regimens than those who did not receive patient teaching.

## CHAPTER 5

### SUMMARY, CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

The purpose of this study was to determine if there was a relationship between knowledge of medication and medication compliance in psychiatric patients who were prescribed psychotropic drugs. Subjects were divided into two groups, an experimental group and a control group. The investigator taught the experimental group subjects about their medications. Subjects in the control group received no patient teaching from the investigator. Two interviews and pill counts were conducted one week apart to obtain data. The following sections of this chapter include a summary of the study, conclusions and implications derived from the study results, and recommendations for future studies.

#### Summary

This explanatory study was conducted in a privately owned hospital with a 15-bed psychiatric unit. Quota sampling was used to select 18 patients who conformed with predetermined criteria. Patients were randomly assigned to



the experimental and control groups. The experimental and control groups each contained nine subjects.

The investigator provided individual medication instructions to all experimental group subjects. They were given medication teaching flyers which were specific to their psychotropic medications. Subjects read the teaching flyers with the investigator, and then were encouraged to ask questions and discuss any information they may have previously acquired regarding their medication regimens. Control group subjects did not receive any teaching from the investigator. Data were obtained from two pill counts, one week apart. Compliance scores were calculated by dividing the number of pills taken by the number of pills prescribed. For subjects who took more than the prescribed number of pills, the excess number was subtracted from the total prescribed then divided by the total. Compliance scores indicated percentages of compliance. These percentages were subjected to a two-way analysis of variance with repeated measures, which examined the difference between the experimental and control groups' compliance rates.

### Conclusions

Compliance with medication regimens was significantly higher in the experimental group than in the control group.

Instructions about their medications were provided through the use of medication teaching flyers to experimental group subjects. The difference between the two groups' compliance scores was attributed to the effective instruction provided by the medication teaching flyers and the investigator. Results of the study supported the hypothesis that psychiatric patients who receive patient teaching will demonstrate more posthospital compliance with their medication regimens than those who do not receive patient teaching. Three subjects, 33.33% of the experimental group, complied 100% for both pill counts compared to 11.11% of the control group subjects. No significant difference was found between compliance scores from one testing period to another.

#### Implications

Subjects who were taught about their medications demonstrated significantly higher compliance rates than subjects who received no patient teaching. This was attributed to the effective instructions provided by the medication teaching flyers and the investigator. A medication instruction program should be initiated to increase psychotropic medication compliance in psychiatric outpatients.

Although experimental group subjects exhibited higher compliance rates than control group subjects, both groups demonstrated noncompliance with their medication regimens.

Further investigations examining reasons for noncompliance should be conducted.

#### Recommendations

The following are recommendations that may be useful in reducing psychotropic medication noncompliance in psychiatric outpatients:

1. This study should be replicated with an increased sample size.
2. Research should be conducted to determine methods for decreasing psychotropic medication noncompliance in psychiatric outpatients.
3. Studies with more control of extraneous variables should be conducted to determine specific factors that may influence compliance with medication regimens.

APPENDIX A

SAMPLE OF A MEDICATION TEACHING FLYER

## TAKING YOUR MEDICATION--LOXITANE

Name\_\_\_\_\_

Date\_\_\_\_\_

The medicine prescribed for you is:

LOXITANE \_\_\_\_\_ mg.

\_\_\_\_\_ Times a day.

Description of drug: Capsule;  $\frac{1}{2}$  of capsule is light green and the other half is yellow.

Loxitane is a tranquilizer which gives very calming effects and also suppresses feelings of agitation.

This drug usually shows signs of sedation within 20-30 minutes after administration, becoming more pronounced within one and one half to three hours.

Loxitane affects both mental and physical alertness especially during the first few days of therapy, therefore your ability to perform, i.e., operating machinery, or driving a car, may be impaired. Alcohol should also be avoided because it increases the strength of Loxitane.

Drowsiness, usually mild, may occur at the beginning of therapy or when the dosage of medication is increased.

If you experience dizziness, faintness, staggering gait, muscle twitching, weakness or confusion, please inform your doctor or nurse.

Tremors, rigidity, excessive salivation, and skin rashes have been observed during hot summer months, please protect yourself from the sun.

It is important not to stop taking your medication unless your doctor tells you to do so. It is very necessary that you take your medication as prescribed since it is a major part of your treatment plan.

From: 1979 Physicians' Desk Reference

APPENDIX B

INTERVIEW SCHEDULE

## INTERVIEW SCHEDULE

1. What medication are you taking?
2. What is the dosage of your medication?
3. How frequently do you take your medication?
4. Are you having side effects from your medication?
5. If you are having side effects, what are they?
6. What is your general level of satisfaction with your medication program?
7. Have you complied with your medication program?
8. If you have not complied with your medication program, how would you describe your noncompliance?



APPENDIX C

PILL COUNT FORM

## PILL COUNT FORM

---

Date

---

Discharge Date

---

Interview Date

	Interview #1	Interview #2
Name of Medication		
Dosage		
Frequency		
# of pills dispensed		
# of pills remaining		
Compliance score		

## REFERENCES

- American Nurses' Association. Standards of psychiatric-mental health nursing practice. Kansas City: The Author, 1973.
- Arnhold, R. G., Adebonojo, F. O., Callas, E. R., Callas, J., Carte, E., & Stein, R. C. Patients and prescriptions. Comprehension and compliance with medical instructions in a suburban pediatric practice. Clinical Pediatrics, 1970, 9(11), 648-651.
- Bakker, C. B., & Dightman, C. R. Psychological factors in fertility control. Fertility and Sterility, 1964, 15(5), 559-567.
- Barker, K. N., & McConnell, W. E. How to detect medication errors. Modern Hospitals, 1962, 99(1), 95-106.
- Beardsley, R. S. Behavioral interventions in patient education. Hospital Formulary, 1978, 13(6), 472-473.
- Bergman, A. B., & Werner, R. J. Failure of children to receive penicillin by mouth. New England Journal of Medicine, 1963, 268(24), 1334-1338.
- Berkowitz, N. H., Malone, M. F., Klein, M. W., & Eaton, A. Patient follow through in the outpatient department. Nursing Research, 1963, 12(1), 16-22.
- Berry, D., Ross, A., Huempfer, H., & Deuschle, K. Self-medication behavior as measured by urine chemical tests in domiciliary tuberculosis patients. American Review of Respiratory Diseases, 1962, 86(1), 1-7.
- Bille, D. A. A study of patients' knowledge in relation to teaching format and compliance. Supervisor Nurse, 1977, 8(5), 55-62.
- Blackwell, B. Drug therapy patient compliance. The New England Journal of Medicine, 1973, 289(5), 249-252.
- Blackwell, B. The drug defaulter. Clinical Pharmacology and Therapeutics, 1972, 13(6), 841-848.

- Bonnar, J., Goldberg, A., & Smith, J. A. Do pregnant women take their iron? The Lancet, 1969, 1(7592), 457-458.
- Brook, R. H., Appel, F. A., Avery, C., Orman, M., & Stevenson, R. L. Effectiveness of inpatient follow-up care. New England Journal of Medicine, 1971, 285(27), 1509-1514.
- Caliandro, G. Programmed instruction and its use in nursing education. Nursing Research, 1968, 17(5), 450-454.
- Charney, E., Bynum, R., Eldredge, D., Frank, D., MacWhinney, J. B., McNabb, N., Scheiner, A., Sumpter, E. A., & Iker, H. How well do patients take oral penicillin? A collaborative study in private practice. Pediatrics, 1967, 40(2), 188-195.
- Clark, C. M., & Bayley, E. W. Evaluation of the use of programmed instruction for patients maintained on Warfarin therapy. American Journal of Public Health, 1972, 62(8), 1135-1139.
- Clinite, J. C., & Kabat, H. F. Prescribed drugs. Errors during self-medication. Journal of the American Pharmaceutical Association, 1969, 9(8), 450-452.
- Clinite, J. C., & Kabat, H. F. Improving patient compliance. Journal of the American Pharmaceutical Association, 1976, 16(2), 74-76.
- D'Altroy, L. H., Blissenbach, H. F., & Lutz, D. Patient drug self-administration improves regimen compliance. Hospitals, 1978, 52(21), 131-136.
- Davis, M. S. Variations in patients' compliance with doctor's orders; analysis of congruence between survey responses and results of empirical investigations. Journal of Medical Education, 1966, 41(11), 1037-1048.
- Davis, M. S. Predicting non-compliant behavior. Journal of Health and Social Behavior, 1967, 8(4), 265-271.
- Davis, M. S. Physiologic, psychological, and demographic factors in patient compliance with doctors' orders. Medical Care, 1968, 6(2), 115-122.

- Davis, M. S., & Eichhorn, R. L. Compliance with medical regimens; a panel study. Journal of Health and Human Behavior, 1963, 4(4), 240-249.
- DelBueno, D. J. Patient education: Planning for success. Journal of Nursing Administration, 1978, 8(6), 3-7.
- Dixon, W. M., Stradling, P., & Wootton, I. D. Outpatient PAS therapy. The Lancet, 1957, 2(7001), 871-872.
- Donabedian, A., & Rosenfeld, L. S. A follow-up study of chronically ill patients discharged from hospitals. Paper presented at the 91st annual meeting of the American Public Health Association, Kansas City, 1963. (Mimeographed)
- Ferebee, S. H. The schizophrenic and oral medication. The Lancet, 1964, 2, 147.
- Fox, L. A. Written reinforcement of auxilliary directions for prescription medications. American Journal of Hospital Pharmacy, 1969, 26(6), 334-341.
- Fox, W. The problem of self-administration of drugs; with particular reference to pulmonary tuberculosis. Tubercle, 1958, 39(5), 269-274.
- Francis, V., Korsch, B. M., & Gozzi, E. K. Gaps in doctor-patient communication. Pediatrics, 1964, 42(5), 855-871.
- Francelmont, J., & Sciafani, M. Self-medication program for the emotionally ill. Journal of Psychiatric Nursing and Mental Health Services, 1978, 16(1), 15-17.
- Fuhrer, L. M., & Bernstein, R. Making patient education a part of patient care. American Journal of Nursing, 1976, 76(11), 1798-1799.
- Gabriel, M., Gagnon, J. P., & Bryan, C. K. Improved patient compliance through use of a daily drug reminder chart. American Journal of Public Health, 1977, 67(10), 968-969.
- Gardiner, Q. The need for drug monitoring in psychiatric practice. British Journal of Psychiatry, 1968, 114, 877-881.

- Gatley, M. S. To be taken as directed. Journal of the Royal College of General Practitioners, 1968, 16(1), 39-44.
- Hammel, R. W., & Williams, P. O. Do patients receive prescribed medication? Journal of the American Pharmaceutical Association, 1964, 4, 331-334.
- Hecht, A. B. Improving medication compliance by teaching outpatients. Nursing Forum, 1974, 13(2), 112-129.
- Heinzelmann, F. Factors influencing prophylaxis behavior with respect to rheumatic fever; an exploratory study. Journal of Health and Human Behavior, 1962, 3, 73-81.
- Hitchens, E. A. Helping psychiatric outpatients accept drug therapy. American Journal of Nursing, 1977, 77(3), 464-466.
- Hladik, W. B., III, & White, S. J. Evaluation of written reinforcements used in counseling cardiovascular patients. American Journal of Hospital Pharmacy, 1976, 33(12), 1277-1280.
- Hulka, B. S., Cassel, J. C., Kupper, L. L., & Burdette, J. A. Communication, compliance, and concordance between physicians and patients with prescribed medication. American Journal of Public Health, 1976, 66(9), 847-853.
- Hussar, D. A. Patient noncompliance. Journal of the American Pharmaceutical Association, 1975, NS15(4), 183-190.
- Ireland, H. D. Outpatient chemotherapy for tuberculosis. American Review of Respiratory Diseases, 1960, 82(2), 378-383.
- Irwin, D. S., Weitzel, W. D., & Morgan, D. W. Phenothiazine intake and staff attitudes. American Journal of Psychiatry, 1971, 127(12), 1631-1635.
- Isenberg, P. L., Mahnke, M. W., & Shields, W. E. Jr. Medication groups for continuing care. Hospital and Community Psychiatry, 1974, 25(8), 517-519.
- Ivey, M. F. The pharmacist in the care of ambulatory mental health patients. American Journal of Hospital Pharmacy, 1973, 30, 599.

- Johnson, W. L. Conformity to medical recommendations in coronary heart disease. Paper presented at American Sociological Association Meeting, Chicago, Illinois, September 2, 1965. (Mimeographed)
- Kline, N. S., & Davis, J. M. Psychotropic drugs. American Journal of Nursing, 1973, 73(1), 54-62.
- Leistyna, J. A., & Macaulay, J. C. Therapy of streptococcal infections. Do pediatric patients receive prescribed oral medication? American Journal of Diseases of Children, 1966, 111, 22-26.
- Ley, P., Jain, V. K., & Skilbeck, C. E. A method for decreasing patients' medication errors. Psychological Medicine, 1976, 6(4), 599-601.
- Liberman, P., & Schwartz, A. J. Prescription dispensing to the problem patient. American Journal of Hospital Pharmacy, 1972, 29, 163.
- Libow, L. S., & Mehl, B. Self-administration of medications by patients in hospitals or extended care facilities. Journal of American Geriatric Society, 1970, 18(1), 81-85.
- Lipman, R. S., Rickels, K., Eberhard, H. U., Park, L. C., & Fisher, S. Neurotics who fail to take their drugs. British Journal of Psychiatry, 1965, 111, 1043-1049.
- Lowe, M. L. Effectiveness of teaching as measured by compliance with medical recommendations. Nursing Research, 1970, 19(1), 59-63.
- Luntz, G., & Austin, R. New stick test for PAS in urine. Report on the use of "Phenestix" and problems of longterm chemotherapy for tuberculosis. British Medical Journal, 1960, 1, 1679-1684.
- Maddock, R. K. Patient cooperation in taking medicines. Journal of the American Medical Association, 1967, 199(3), 169-172.
- Malahy, B. The effect of instruction and labeling on the number of medication errors made by patients at home. American Journal of Hospital Pharmacy, 1966, 23(6), 283-292.

- Marshall, E. J. Why patients do not take their medication. American Journal of Psychiatry, 1971, 128(5), 656.
- Marston, M. V. Compliance with medical regimens: A review of the literature. Nursing Research, 1970, 19(4), 312-323.
- Mason, A. S., Forrest, I. S., Forrest, F. M., & Butler, H. Adherence to maintenance therapy and rehospitalization. Diseases of the Nervous System, 1963, 24(2), 103-104.
- Michaux, W. W. Side effects, resistance, and dosage deviations in psychiatric outpatients treated with tranquilizers. Journal of Nervous and Mental Disorders, 1961, 133(3), 203-212.
- Mohler, D. N., Wallin, D. G., & Dreyfus, E. G. Studies in the home treatment of streptococcal disease. I. Failure of patients to take penicillin by mouth as prescribed. New England Journal of Medicine, 1955, 252(26), 1116-1118.
- Morris, L. A., & Halperin, J. A. Effects of written drug information on patient knowledge and compliance: A literature review. American Journal of Public Health, 1979, 69(1), 47-52.
- Morrow, R., & Rabin, D. L. Reliability in self-medication with isoniazid. Clinical Research, 1966, 14(2), 362.
- Moulding, T. Preliminary study of the pill calendar as a method of improving the self-administration of drugs. American Review of Respiratory Diseases, 1961, 84(2), 284-287.
- Moulding, T., Onstad, D., & Sbarbaro, J. A. Supervision of outpatient drug therapy with the medication monitor. Annals of Internal Medicine, 1970, 73(4), 559-564.
- Neeley, E., & Patrick, M. L. Problems of aged persons taking medications at home. Nursing Research, 1968, 17(1), 52-55.
- O'Brien, J. Teaching psychiatric inpatients about their medications. Journal of Psychiatric Nursing and Mental Health Services, 1979, 17(10), 30-32.



- Park, L. C., & Lipman, R. S. A comparison of patient dosage deviation reports and pill counts. Psychopharmacologia, 1964, 6, 299-302.
- Parkes, C. M., Brown, G. W., & Monck, E. M. The general practitioner and the schizophrenic patient. British Medical Journal, 1962, 1, 972-976.
- Physicians' Desk Reference. New Jersey: Medical Economics Company, 1979.
- Pitman, E. R., Benzier, E. E., & Katz, M. Clinic experience with a urine PAS test. Diseases of the Chest, 1959, 36(1), 1-2.
- Porter, A. M. W. Drug defaulting in a general practice. British Medical Journal, 1969, 1, 218-222.
- Pragoff, H. Adjustment of tuberculosis patients one year after hospital discharge. Public Health Reports, 1962, 77(8), 671-680.
- Puckett, M. J., & Russell, M. L. The role of the allied health professional in improving patient adherence. Journal of Allied Health, 1978, 7(1), 36-41.
- Raskin, A. A comparison of acceptors and resistors of drug treatment as an adjunct to psychotherapy. Journal of Consulting Clinical Psychologists, 1961, 25(4), 366.
- Redman, B. K. The process of patient teaching in nursing. St. Louis: The C. V. Mosby Company, 1972.
- Reinders, T. P. Patient medication: A program for compliance. Hospital Formulary, 1978, 13(2), 144-145.
- Renton, C. A., Affleck, J. W., Carstairs, G. M., & Forrest, A. D. A follow-up of schizophrenia patients in Edinburgh. ACTA Psychiatrica Scandinavica, 1963, 39, 548-600.
- Reynolds, E., Joyce, C. R. B., Swift, J. L., Tooley, P. H., & Weatherall, M. Psychological and clinical investigation of the treatment of anxious out-patients with 3 barbiturates and placebo. British Journal of Psychiatry, 1965, 111, 84-95.
- Richards, A. D. Attitude and drug acceptance. British Journal of Psychiatry, 1964, 110, 46-52.

- Rickels, K., & Briscoe, E. Assessment of dosage deviation in outpatient drug research. Journal of Clinical Pharmacology and the Journal of New Drugs, 1970, 10(3), 153-160.
- Robin, A. A., & Freeman-Browne, D. L. Drugs left at home by psychiatric patients. British Medical Journal, 1968, 3, 424-425.
- Romankiewicz, J. A., Gotz, V., Capelli, A., & Carlin, H. S. To improve patient adherence to drug regimens--an interdisciplinary approach. American Journal of Nursing, 1978, 78(7), 1216-1219.
- Roth, H. P., & Berger, D. G. Studies on patient cooperation in ulcer treatment. I. Observation of actual as compared to prescribed antacid intake on a hospital ward. Gastroenterology, 1960, 38(4), 630-633.
- Roth, H. P., Caron, H. S., & Hsi, B. P. Measuring intake of a prescribed medication. A bottle count and a tracer technique compared. Clinical Pharmacology and Therapeutics, 1970, 11(2), 228-230.
- Sackett, D. L., Gibson, E. S., Taylor, D. W., Haynes, R. B., Hackett, B. C., Roberts, R. S., & Johnson, A. L. Randomized clinical trial of strategies for improving medication compliance in primary hypertension. The Lancet, 1975, 1(7918), 1205-1207.
- Schwartz, D. Safe self-medication for elderly outpatients. American Journal of Nursing, 1975, 75(10), 1808-1810.
- Schwartz, D., Wang, M., Zeitz, L., & Goss, M. E. Medication errors made by elderly, chronically ill patients. American Journal of Public Health, 1962, 52(12), 2018-2029.
- Sclafani, M. Medication classes for the emotionally ill. Journal of Psychiatric Nursing and Mental Health Services, 1977, 15(4), 13-16.
- Seidl, L. G., Thornton, G. F., Smith, J. W., & Cluff, L. E. Studies on the epidemiology of adverse drug reactions. Bulletin of the Johns Hopkins Hospital, 1966, 119, 299-315.
- Sharpe, T. R., & Mikeal, R. L. Patient compliance with antibiotic regimens. American Journal of Hospital Pharmacy, 1974, 31, 479.

- Sharpe, T. R., & Mikeal, R. L. Patient compliance with prescription medication regimens. Journal of the American Pharmaceutical Association, 1975, 15(4), 191-192, 197.
- Stewart, R. B., & Cluff, L. E. A review of medication errors and compliance in ambulant patients. Clinical Pharmacology and Therapeutics, 1972, 13(4), 463-468.
- Sumner, E. D., & Meunier, J. F. A medication follow-up study on college students. Journal of American College Health Association, 1970, 18(5), 358.
- Willcox, D. R. C., Gillan, R., & Hare, E. H. Do psychiatric outpatients take their drugs? British Medical Journal, 1965, 2(5465), 790-792.
- World Health Organization, Expert Committee on Nursing. Second Report, World Health Organization Technical Report. Series No. 49. Geneva: The Author, June 1952.
- Wynn-Williams, N., & Arris, M. On omitting PAS. Tubercle, 1958, 39(3), 138-142.