

AN EVALUATION OF FOUR METHODS OF
PHARMACIST-CONDUCTED PATIENT EDUCATION

A Thesis

Submitted to the Faculty of Graduate Studies
in Partial Fulfilment of the Requirements

For the Degree of
Master of Science
in Pharmacy

by

Brenda J. Balderston, B.S.P.

Saskatoon, Saskatchewan

August, 1979

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Dean of the College of Pharmacy
University of Saskatchewan
Saskatoon, Saskatchewan
S7N 0W0
Canada

ACKNOWLEDGMENTS

The author wishes to express grateful appreciation to the numerous people whose support and assistance has made the preparation of this thesis possible. To the staff of Medical Arts Pharmacy in Saskatoon, my thanks for their cooperation during the course of the study. I would like to especially thank Mr. Don McBean, Owner of Medical Arts Pharmacy, Saskatoon, for allowing me the opportunity to conduct the research at his pharmacy. I also wish to thank the student-interviewers who spent many hours collecting the data for this study. And to Miss Sharon Kreiter, who made time in her busy schedule to type this thesis, thank you for an excellent job.

I wish to express a special thank you to my advisor, Dr. J.L. Blackburn, Professor of Clinical Pharmacy, College of Pharmacy, University of Saskatchewan, who, during the past two years, has provided me with invaluable assistance and guidance. Without his continual encouragement and support, this thesis could not have been completed.

I would like to thank the following members of my thesis committee for their time and effort on my behalf: Dr. S.M. Wallace, Dr. K.W. Hindmarsh and Dean B.R. Schnell. Their help is deeply appreciated. I would also like to thank my external examiner, Dr. D.D. Johnson, for expressing an interest in this research.

Finally, to my many friends, colleagues and especially to my family, my deepest thanks for your support and understanding during the past two years.

ABSTRACT

The purpose of this study was to implement four methods of patient education in an ambulatory care setting and to evaluate their relative effectiveness in improving patients' knowledge of and compliance with prescribed medical regimens. The four methods of patient education evaluated in this study are: 1) written information only; 2) written and verbal information presented in a non-private area; 3) written and verbal information presented in a private area; and 4) written information with verbal information presented by telephone. The effectiveness of these four methods was evaluated against two control groups who received no information on their medication.

One hundred and fifty-five patients with chronic disorders were randomly assigned to one of the six study groups when they received a prescription from Medical Arts Pharmacy in Saskatoon, Saskatchewan. All patients were 40 years of age or older and approximately one-half of each study group was 65 years or older.

The study follow-up consisted of two patient interviews conducted over a three-week period from the College of Pharmacy in Saskatoon. A telephone interview one to three days after the prescription was received tested patients' short-term knowledge of their medication and assessed the number of side effects patients attributed to their medication. A home interview three weeks after patients received their medication tested their retention of knowledge and their compliance (by pill count) with the medication regimen. A number of attitude and satisfaction questions were asked at this home interview. Patients were unaware these interviews

were related to the patient education services they received at Medical Arts Pharmacy.

One hundred and fourteen patients completed the follow-up period. The demographic characteristics measured were evenly distributed across the study groups with the exception of the number of years of education. This variable is not known to influence any of the dependent variables measured in this study.

The results indicated that private patient education is the most effective method of informing patients about their medication while they are in the pharmacy. The patients in this study group had a mean short-term knowledge score of 63 percent and a mean compliance score of 80 percent at the time of the home interview. Both of these scores were significantly ($p < .05$) higher than those obtained by the two control groups who demonstrated mean short-term knowledge scores of 34 percent and 38 percent and compliance scores of 60 percent and 64 percent. Neither written information alone nor written and verbal information presented in the non-private area caused this alteration in compliance and all study groups had a lower level of knowledge than patients who received private patient education.

Patients educated with written and verbal information in the non-private area had a mean short-term knowledge score of 53 percent and were significantly more knowledgeable than patients who received no information. However, because a similar increase in compliance did not occur (group mean = 70 percent), this method of patient education cannot be regarded as effective as private patient education.

Patients receiving only written information as a method of patient education had a mean short-term knowledge score of 46 percent and a mean compliance score of 69 percent. Neither of these scores were significantly different from those found with the control groups. These results have important implications for the appropriate utilization of written information sheets such as those presently being prepared by the Canadian Pharmaceutical Association. If pharmacists were to use these sheets without verbally reinforcing the information, the cost of producing and distributing the written information would not be justified. The findings of this study support the recommendations that pharmacists should provide private consultation areas for their patients. This method of patient education was the most time-consuming of the interventions tested in this study. It will be necessary for pharmacists to make an effort to alter existing work patterns so adequate time will be available for a complete discussion with the patient.

Education of patients by telephone appears to offer the pharmacist an effective means of reaching patients who do not come to the pharmacy for their prescription. Patients in this study group had a mean short-term knowledge score of 58 percent and a mean compliance score of 85 percent. This study is the first known evaluation of this method of patient education and further research exploring the effectiveness of telephone education would be valuable. This intervention required three-quarters of the amount of time required for private patient education. Pharmacists may find patient education by telephone is easier than private patient education to incorporate into a busy dispensary.

Whenever possible, factors known to influence patients' compliance were measured and compared by study group to determine if they were similarly distributed. Group distribution of complexity of the medication regimen, duration of therapy, agreement with the physician's diagnosis, and the degree of family support did not account for the differences in compliance found in this study.

Although the difference was not statistically significant, more patients who received private patient education reported that they had experienced a side effect from their medication. This may have been due to the increased awareness of this study group of the association between symptoms present before they received patient education and their medication. No negative effects were noted in this regard. These observations support the need to inform patients about side effects possibly associated with their medication.

The majority of patients felt pharmacists should be offering patient education services when these services were discussed at the home interview. As well, patients were receptive to the availability of a private area in pharmacies and indicated a willingness to go out of their way and to pay a nominal fee for this service. On the other hand, most patients reported they had been satisfied with the pharmacy services three weeks prior to the home interview even when they had received only the traditional dispensing service. Most patients indicated also that they would contact a physician before they would contact a pharmacist when they had a question about prescription drugs. Approximately one-half of the study population chose the physician as a primary source of non-prescription drug information.

There were no significant differences between the study groups' attitudes toward the role of the pharmacist. These findings suggest education of the public is needed with regard to what to expect from a pharmacist when a prescription is dispensed and to the potential value of the pharmacist as a source of drug information.

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CHAPTER I
INTRODUCTION

The overall function of the profession of pharmacy is the promotion of patients' health and safety through effective drug-use control (1). Drug-use control, a concept which covers a number of individual and specific pharmaceutical activities, was defined by Brodie in 1966 as "that system of knowledge, understanding, judgments, procedures, skills, controls and ethics that assures optimal safety in the distribution and use of medication." (2) In 1975, the Report of the Study Commission on Pharmacy described the profession of pharmacy as encompassing not only the development, manufacturing and distribution of drug products, but also the development, organization and distribution of knowledge and information about drugs (3). It is this latter area of pharmacy practice, the transmission of knowledge and information about drugs which is the major focus of this thesis. More specifically, this thesis is concerned with an examination of the pharmacist's role in providing accurate and useful drug information to the patient so he may make more informed and rational decisions which will maintain and improve his health.

A. Increased Interest in Patient Education

Recently several groups in our society have expressed an increased interest in patient education.

Government interest stems from the realization that despite advancements in medical technology and vast expenditures on the care of those who are ill, there is little improvement in the overall health of

Canadians. In an attempt to reverse the growing concern for the apparent ineffectiveness of the health care system, the Government of Canada published a working document in 1974 entitled, "A New Perspective on the Health of Canadians" which emphasized the need for an improved approach to health care (4). The concept of health care presented in this document incorporates not only health care for those who are ill, but also emphasizes the preventative aspects of health maintenance with the recognition of each individual's responsibility for his health. Preventative medicine and the promotion of self care is dependent upon a well-informed public. The Canadian Government has become committed to patient education as one mechanism to both improve the quality of health and contain or reduce the rapidly escalating cost of health care.

Part of the cost of health care is dependent upon patients' performance in managing their drug therapy. Approximately 80 percent of patients receive their medications on an outpatient basis (5) and studies show only one-half of these patients can be expected to take their medications as intended by the physician (6). Because additional medical care may be needed when a patient does not comply with the prescribed medical regimen, there is often an unnecessary addition to the cost of health care.

Concern for outpatients' use of medication stems also from the fact most drugs used today are relatively potent and have the potential for inducing illness themselves. It is estimated that three percent to six percent of patients are admitted to hospital due to adverse drug reactions (7). Many of these reactions could have been prevented had someone

interacted with the patient to detect the adverse drug reaction before it became serious enough to require hospitalization.

The government has reviewed these facts and is pressing for greater involvement by pharmacists in educating the Canadian public. Speaking to the Annual Conference of the Canadian Pharmaceutical Association in May of 1974, the Honorable Marc Lalonde, then Minister of National Health and Welfare, stated:

"Every pharmacist in Canada must be enlisted for the difficult task of changing people's attitudes and behavior toward proper treatment. You are ideally situated between the physician and the individual to reinforce the importance of therapy, carefully and regularly taken, and the need to complete any prescribed series of medication. We need your assistance in this vital educational role if we are to bring this problem under control." (8)

Consumer groups have expressed an interest in patient education. These groups are becoming more involved in reforms that affect the cost and quality of health care and are speaking out on the present lack of drug-related information. Erma Angevine, past director of the Consumer Federation of America, in a 1973 presentation to the American Society of Hospital Pharmacists stated:

"Pharmacists have a unique opportunity to inform a vulnerable patient - to make him a healthier consumer ... [the pharmacist's] responsibility is to see that each patient gets the proper drug therapy; to see he knows how and when to take his medication; and to see he is warned and safe-guarded against contraindications." (9)

This group recommended written information, understandable to the consumer, be given to the recipients of all prescriptions. In 1975, they

petitioned the United States Food and Drug Administration to require that this written warning information be provided to all patients.

At their 1977 National meeting, the Consumers' Association of Canada expressed concerns about the lack of understanding by patients and the need for more consistent labelling and information from the pharmacist. These discussions resulted in the passing of a resolution which read:

"When additional information vital to the safety of the patient is necessary but cannot be included on the prescription label, due to the lack of space, this written information shall accompany the medication container." (10)

It is of particular significance to the profession of pharmacy that these recommendations are being heard and supported by government officials. In both countries, steps presently are being taken on a national scale to provide written drug information to patients and consumers (10, 11).

Coupled with consumers' expectations for information on their medication is an increased awareness by the public of their right to sue if these expectations are not met. The traditional role of the physician as the provider of information has now been extended to include the pharmacist in cases of negligence (12). Legal precedents are being established by patients who have sued the pharmacist as well as the physician for supplying insufficient drug information that subsequently resulted in patient injury (13). Thus, pharmacists can no longer ignore consumer demands for patient education.

The increased emphasis on patient education suggests that major attention be given to an examination of the role of the pharmacist as a provider of drug information to patients. Many methods of communicating information to patients have been proposed in pharmaceutical literature. The purpose of this study is to objectively evaluate the clinical impact of four methods of pharmacist-conducted patient education.

CHAPTER II

THE NEED FOR PATIENT EDUCATION

Patient non-compliance, or failure of a patient to adhere to a prescribed medical regimen, is recognized as one of the major unsolved therapeutic problems facing physicians, pharmacists and other health care professionals today (14, 15). A recognition of the extent of non-compliance and an appreciation of its consequences are essential if health care professionals are to play a role in solving this problem. An understanding of the nature of non-compliance is necessary when evaluating strategies designed to improve patients' compliance. The purpose of this chapter is to acquaint the reader with studies documenting the magnitude and determinants of non-compliance and to provide support for the need for patient education.

A. The Magnitude of Non-Compliance

Numerous studies have been conducted in an attempt to identify the extent of non-compliance. There exists no standardized methodology to assess non-compliance and studies vary widely in their individual estimates of the problem. Several in-depth literature reviews (16, 17) indicate up to 50 percent of ambulatory patients do not take their medication as prescribed by the physician. A recent review (6) of studies documenting patients' compliance with chronically prescribed medications revealed these patients take an average of 54 percent of their prescribed dosage.

In 1969, Latiolais and Berry (18) interviewed 180 indigent

outpatients of a university hospital who were taking a total of 403 prescription medications. These investigators found 42.8 percent of patients were making at least one pre-defined medication error. Further analysis revealed 10.2 percent of all patients were misusing their prescriptions in a manner which could be detrimental to their health. Overdosage occurred in 41 percent of cases while omission of one or more doses occurred in 23.6 percent of cases. The most common reasons for error stated by the patient were "he did not understand the instructions" or "he thought he needed an extra dose."

Five years later, Boyd et al. (19) duplicated this study and found 78 percent of 380 study prescriptions from a hospital outpatient pharmacy were being consumed improperly. Improper dosing intervals and premature discontinuation of the medication were the most frequently reported medication errors. The most significant finding in this study is 31 percent of the prescription medications were being used in a manner which posed a serious threat to the patient's health. The authors concluded a major contributing factor to the non-compliance problem was a lack of complete and comprehensible directions from either the physician or the pharmacist.

Geriatric patients are an important subset of the outpatient population and are subject to errors in self-administration of medications. Schwartz et al. (20) interviewed 178 chronically ill geriatric outpatients and found 59 percent made one or more medication errors and 26 percent made potentially serious errors.

The type of error encountered most frequently was omission of the medication (47 percent). Forty percent of the patients were found to be confused or wrong about the general purpose of at least one of their medications. Patients' responses indicated they were not taking their medications as intended because of this lack of knowledge.

Similar results were obtained by Neely (21) who found 59 percent of elderly outpatients made at least one medication error. Thirty-two percent of this population made errors which had the potential for serious repercussions to their health.

In addition to documenting non-compliance does exist, these studies also demonstrate that without knowledge of how to take medication, patients may be expected to make serious errors.

A recent study by McKenny and Harrison (1976) (22) examined a possible consequence of these errors. These investigators found 18.4 percent of 216 hospitalized patients interviewed were admitted to hospital either as a direct result of an adverse drug reaction (7.9 percent) or due to patient's non-compliance with their medical regimens (10.5 percent). All drugs implicated in non-compliance related hospital admissions were prescribed as maintenance therapy for chronic diseases. Examples of the complications resulting from non-compliance included an increased number of seizures in patients taking anticonvulsants and a loss of control of blood pressure in patients taking antihypertensive medication. These authors point out the improper use of medications which were associated with hospital admissions were largely preventable and

a significant portion of the hospital days could have been avoided if the patient had been properly educated.

Documentation and confirmation of the magnitude of non-compliance in the ambulatory patient population has not resulted in a decrease in its incidence over the past several years. Studies conducted in 1978 have reported a high rate of non-compliance in congestive heart failure patients (23), hypertensive patients (24), asthmatics (25), epileptics (26), diabetics (27), and the geriatric patient (28, 29). These studies stress non-compliance is a present day problem which must be examined in greater depth by all health professionals.

B. The Determinants of Non-Compliance

Efforts to solve the non-compliance problem have centered primarily on the identification of factors influencing non-compliance, with the hope non-compliant patients could be identified and steps then could be taken to alter their behavior. The extent of research devoted to this search for the predictors of non-compliance is reflected in a recent review by Haynes (30) of 185 original compliance studies which have examined over 200 separate variables. Few associations have been found between these variables and non-compliance, with much of the work yielding either inconclusive or conflicting results.

Only those variables necessary for an understanding of the nature of non-compliance are discussed in this chapter. These variables are discussed as they relate to: 1) sociodemographic features of the patient;

2) features of the disease state; 3) features of the source of therapy; 4) features of the therapeutic regimen; 5) patients' knowledge of the therapeutic regimen; and 6) sociobehavioral features of the patient.

1. Sociodemographic Features of the Patient

Investigators have studied the relationship of social and demographic characteristics of the patient to non-compliance in great detail. Latiolais and Berry (18) and Boyd et al. (19) studied a randomly selected cross section of the outpatient population. Their efforts to isolate common factors in non-compliant patients were unsuccessful. These authors were forced to conclude the tendency to make errors in self-administration does not correlate with any one factor, with the possible exception of age. Both studies found greater non-compliance with increased age, indicating patients over 65 years may be more prone to non-compliance. This finding is not consistent with the results of other studies (31, 32, 33) and it is likely the effects of aging on compliance are multiple in nature.

While geriatric patients may not necessarily be more prone to non-compliance than younger patients, they deserve special consideration. Studies indicate up to 80 percent of patients over the age of 65 suffer from one or more chronic diseases compared to 40 percent under the age of 65 (34). Consequently, geriatric patients use more medication than any other age group (35, 36) and because of alterations in physiologic function are at increased risk for adverse effects from drugs (37, 38).