HEALTH LOCUS OF CONTROL, HEALTH VALUE, AND

COMPLIANCE WITH SCHEDULED APPOINTMENTS

A THESIS

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We hereby recommend that the thesis prepared under

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be accepted as fulfilling this part of the requirements for the Degree of

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CHAPTER 1

INTRODUCTION

An estimated 10,000,000 Americans have diabetes. This disease has been recognized as the third leading cause of death in the United States, claiming over 300,000 lives annually. Complications associated with diabetes include arteriosclerosis, eye and kidney diseases, foot disorders, gangrene, and psychological complications (American Diabetes Association, 1978).

Although there is no cure, 50% of adult diabetics control the disease through diabetic diets (MacDermott, 1980). For the individual with mild diabetes or the individual who cannot take insulin injections, diabetes may be treated with oral medicines. Several studies have revealed that with adequate dietary and/or medication management the diabetes can be controlled and complications reduced, thus decreasing morbidity and mortality.

A high percentage of diagnosed diabetics do not comply with the dietary and/or medication regimen set forth by their physicians. Noncompliance not only is associated with a great deal of discomfort, disability,

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and death, but also has an influence on the entire health care system in terms of increased hospital and clinic costs.

More effective treatment of diabetes might be achieved if noncompliance could be predicted at the beginning of treatment. Utilization of health locus of control might be such a means of distinguishing between those likely to comply and those unlikely to comply.

Problem of Study

Do adults who have had diabetes for at least 6 months, who hold internal health locus of control beliefs and have high health values, keep a higher rate of clinic appointments than adult diabetics who have internal health locus of control beliefs and low health values, or adult diabetics who hold external health locus of control beliefs regardless of their health values when age and duration of illness are controlled?

Justification of Problem

Since the discovery of insulin in 1921, many diabetics have lived longer lives; however, this longer life span has revealed new complications, including

blindness, heart disease, stroke, gangrene, and kidney failure. The general public has not viewed diabetes as a serious national health problem because insulin has been thought of as a "cure." While diabetes cannot be cured, most may be controlled by insulin injections and careful adherence to a controlled diet. Insulin has prevented death from diabetic coma and controlled the symptoms of this disease. Treatment of the disease has advanced due to the introduction of several drugs which can be taken orally and better knowledge of insulin therapy.

The problem of compliance with diabetic diet and medication therapy has been a special concern of the medical profession. Davis (1968) tested 154 new patients for compliance with doctor's advice and found that identification of patients not likely to follow advice could improve medical care and doctor-patient communication as well as other aspects of health education. If noncompliant patients could be identified early in medical treatment, health education programs might help to eliminate misunderstanding and to motivate, reinstruct, and support the patient (Parcel, Nader, & Rogers, 1980).

Ellsberg and Refkin's (1970) study of compliance with dietary restrictions revealed that an inadequately followed diabetic diet may be more responsible for poor control of the disease than failure to take insulin. A large percentage of patients who develop diabetes in middle and later life retains the ability to produce insulin to some extent. Consequently, the amount of insulin may be adequate if the amount and type of food are adjusted in accordance with physical activity (Krall, 1978).

The literature also revealed that there is a need to improve patient compliance to the medication regimen. Although the studies have shown no consensus about why noncompliance is such a common problem, or how a non-compliant section of a given population can be identified early in treatment, these studies have been useful in documenting certain methods of increasing compliance. These methods, however, are expensive to institute. If a method could be found for predicting noncompliant patients early in treatment, the focusing on interventions designed to increase compliance might be more practical and economically feasible. Identification of health locus of control including determination

of health values might be such a means of distinguishing between those likely to comply and those unlikely to comply.

Nurses, who spend a proportionally greater amount of time with patients than other health professionals, have a responsibility for initiating interventions to increase compliance. Knowledge of health locus of control beliefs and health values could help nurses to better understand compliance and to identify the patient prone to noncompliance.

Theoretical Framework

The concept of internal versus external control of reinforcement is a component of social learning theory (Rotter, 1954; Rotter, Chance, & Phares, 1972). Social learning theory stresses the importance of social reinforcement for both cognitive and personality growth (Rotter, 1966). Three factors must be considered in assessing the likelihood that an individual will behave in a certain way: an individual's locus of control, the relative value placed on the results of a behavior, and the situation (both physical and psychological) in which the behavior decision is made (Parcel et al., 1980).

Locus of control is a term used to describe the nature of an expectation that a particular event will occur as a result of a specific act of behavior. If the person perceives that this event is dependent upon luck or upon powerful others, the person is said to have an external locus of control. If the person believes the event is dependent upon one's own behavior, then this person has an internal locus of control.

In Rotter's conceptualization, the value of reinforcement is very important. Rotter (1975) stated:

> If we want to predict a specific behavior, such as studying for an exam, voting in an election, taking part in a student protest, etc., we would have to know something about the values of the available reinforcement to a particular person before anything like an accurate prediction could be made. (p. 58)

The stress on the value of the reinforcement becomes more understandable when the importance of value is investigated. According to Rokeach (1969), a value becomes

> a standard or criterion for guiding action, for developing and maintaining attitudes toward relevant objects and situations, for justifying one's own and others' actions and attitudes, for morally judging self and others, and for comparing self with others. (p. 160)

When behavior and its consequence are believed to lead to the attainment of a desirable personal goal, the

result will be evaluated as having a higher priority
than the other possible results. Lefcourt (1976) sum-
marized,

> it is this equal emphasis upon value, expectancy
> of reinforcement and situational specificity
> that makes Rotter's theory unique among learn-
> ing theories. (p. 27)

The purpose of this study is to show how social
learning theory (Rotter et al., 1972) provides a
theoretical framework for studying individual's locus
of control beliefs and compliant behavior regarding
health care. According to Rotter et al.'s social learning
theory, a person will engage in goal-directed behavior
only if the individual values the particular reinforcers
available and believes that one's actions will actually
lead to these reinforcers in a particular situation
(Wallston, Maides, & Wallston, 1976). Thus, a person
might be more compliant with a therapeutic regimen if
the person both values the outcome (health) and believes
that one's behavior will influence one's health.

Using Wallston, Wallston, Kaplan, and Maides'
(1976) concept of locus of control, it might seem that
the patient with an internal locus of control and high
value would be more likely to comply with medical regi-
men; whereas, a patient with an external locus of control

might be more likely to be noncompliant as he may believe that nothing he can do will affect his health outcome, even if the values of that reinforcement are high.

Assumptions

The following assumptions were made:

1. Each subject will be aware that she/he has a diagnosis of diabetes.

2. Each subject will answer all questions to the fullest extent of her/his ability.

3. The goal of compliant behavior is to achieve objectives which are patient-centered as well as provider-centered.

4. Most human social behavior is learned.

5. Beliefs in external and internal control vary among people.

6. People place different values on their health.

Hypotheses

1. Adult diabetics who have had the disease for at least 6 months, who hold internal health locus of control beliefs, and have high health values will keep a higher percentage of their clinic appointments than adult diabetics who have internal health locus of control

beliefs and have low health values when age and duration of illness are controlled.

2. Adult diabetics who have had the disease for at least 6 months, who hold internal health locus of control beliefs, and have high health values will keep a higher percentage of their clinic appointments than adult diabetics who hold external health locus of control beliefs regardless of their health values when age and duration of illness are controlled.

Definition of Terms

For the purposes of this study, the following terms were operationally defined:

1. Diabetic--a person with a diagnosis of diabetes of at least 6 months, made by the patient's physician and recorded in the patient's record.

2. Health Locus of Control--the score received on the Health Locus of Control Scale (Wallston, Wallston, Kaplan, & Maides, 1976). Subjects whose scores were more than 1 point above the median were placed in the external group and those that scored more than 1 point below the median were placed in the internal group.

3. Health Value--the score received on the Value Scale (modified by Wallston and Wallston (1978) from Rokeach's (1973) Value Survey). Subjects who ranked health as number one were classified as having high health values and all other subjects were classified as having low health values.

4. Compliance--the percentage of appointments kept over a 6-month period was used as a measure of compliance or noncompliance.

Limitations

The following limitations may have influenced the outcome of this study:

1. The educational level and intellectual ability may have influenced the responses to the questionnaires.

2. People react differently when they are being studied.

3. Wallston Health Locus of Control Scale (Wallston, Wallston, Kaplan, & Maides, 1976) is a subjective instrument and subjects may be mislabeled as internalist or externalist due to the inaccuracy of their self-perception.

4. The single measure of compliance, percentage of appointments kept, may limit the validity of the conclusion.

5. No validity or reliability studies were located for the Value Scale.

Summary

Diabetes has been demonstrated to be a major health problem in the United States. Complications of the disease develop even with the most ideal treatment regimens, and these complications involve many body systems, such as the kidneys, the eyes, and the cardio-vascular system. Noncompliance with diabetic controls has been shown to be a major reason for chronic complications and deaths.

Few studies have examined the relationship between noncompliance with diabetic therapeutic regimen and health locus of control. Investigation of this relationship might furnish information that would prove helpful in predicting noncompliance at the beginning of treatment and in increasing the adequacy of treatment for many diabetic patients.

CHAPTER 2

REVIEW OF LITERATURE

The review of literature has three major sections.
The first contains a discussion of the concepts of dia-
betes, incidence, mortality, morbidity, and clinical
management as discussed in professional literature.
The second pertains to the problem of noncompliance,
possible causes, and interventions designed to promote
compliance. The third is concerned with social learn-
ing theory and locus of control.

Diabetes

Diabetes mellitus is a chemical disorder of the
body, primarily involving an inability to properly
utilize sugar and other chemical compounds. It is
characterized by an elevation in the concentration of
sugar in the blood and also by the appearance of sugar
in the urine. Childhood diabetes is usually due to
severe insulin deficiency; when it first appears in
adult life it is often associated with normal or in-
creased insulin levels. In the latter case something
interfering with insulin utilization seems more likely
(Kannel & McGee, 1979).

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The general condition of diabetes was first described by a Greek physician, Aretalus, (cited in Krall, 1978) who lived from 81 to 138 A.D. Two German scientists, von Mering and Minkoweki (cited in Krall, 1978), noted in 1889 that if the pancreas were removed, the animal developed diabetes. Later scientists discovered that even if the pancreas were destroyed, the animals did not become diabetic if the islets were preserved. Best and Banting (cited in Krall, 1978) in Ontario in 1929, obtained minced and purified islet tissues from animals and injected the material into an animal with diabetes and found that the blood sugar levels fell. This was an important event for diabetics everywhere and "signaled a whole new era in the treatment of diabetes" (Krall, 1978, p. 7).

It has been estimated that there are 10,000,000 known, undiagnosed, and potential diabetics in the United States, with an increased incidence of 6% annually (MacDermott, 1980). The Committee on Statistics of the American Diabetes Association (American Diabetes Association, 1978) estimated there are, "1.25 million diabetics who take daily injections of insulin, 1.25 million on oral medication, and 3.5 million whose diabetes is controlled by diet alone" (p. 1).

Early and accurate diagnosis is essential for effective and safe control of diabetes. Physicians no longer consider urine glucose measurements an adequate diagnostic procedure and, instead are testing blood concentrations to detect diabetes. A fasting blood glucose greater than 110 mg/dl clearly indicates diabetes. In postprandial testing, the diagnostic criteria are blood glucose levels greater than 160 mg/dl 1 hour after a meal, and greater than 110 mg/dl 3 hours after a meal (Kozak, 1979).

Dietary therapy in the treatment of diabetes is of great importance since 80% of all maturity-onset diabetics are obese at the time of diagnosis. A large number of diabetics might control the disease solely by dieting, but noncompliance is a major stumbling block to effective dietary treatment. Failure to adhere to a diet appears to be the most common explanation for poor diabetic control. It is important, then, that doctors and nurses make greater efforts to educate patients to the importance of adhering to their diet and engaging in some kind of physical activity (Krall, 1978).

Diabetes is a condition where the individual cannot know too much about the disease. The more one knows

about the disease, the better one will respond to
prescribed treatment, and hopefully, the healthier
and happier one will be. Rosenthal (1960) stated that
diabetics must assume essential roles in managing their
disease and patient education may improve the individ-
ual's response through increased knowledge of the
disease.

Nickerson (1972) concluded that diabetic control is
based on client knowledge about self-care. Nickerson's
research sample consisted of 74 uncontrolled patients who
had had diabetes for an average of 7 years. Results
showed that more than one-half of the patients could not
answer questions basic to an understanding of diabetes
mellitus; however, individualized teaching improved all
scores.

Skelton (1973) conducted a similar study in Canada.
The setting was a suburban hospital and the control
group consisted of diabetic patients who had acquired
their knowledge of diabetes in various ways. The experi-
mental groups were provided with a learning kit empha-
sizing readability. Skelton found that patients in the
control group did not always understand diabetic
pamphlets and other teaching tools. The group of

patients using the kit demonstrated greater knowledge, as measured by posttesting.

Orem's (1971) theory of self-care includes "the belief that the individual's ability to initiate and preserve in his self-care is dependent on his having specific and requisite knowledge and skills" (p. 27). Orem (1971) stated that it is important to educate the individual in self-care practices by developing one's knowledge, skills, and attitudes. Orem described self-care as a goal-directed activity which seeks results. The diabetic faced with a lifetime of daily insulin injections or dietary restrictions must make decisions that will be influenced by one's level of maturity, knowledge, past life experiences, previous habits of thought, and the individual's physical and mental health.

Patient education is an essential nursing function especially with diabetic patients who are responsible for most of their own care. The more knowledge diabetics have of the disease process, causes, and treatment, the more likely they will control the disease and possibly live a more normal, productive life. A complete understanding of insulin or oral agent therapy in both the

disease process and treatment is of great importance
to nurses who teach diabetic patients what they need
to know. Great strides have been made in diabetes
research since the early years of sporadic discovery.
As a result of new knowledge, the diabetic patient
now has an extended life span, and increased level of
wellness, a greater chance to prevent or manage compli-
cations, and an opportunity to lead a more productive
life.

Noncompliance

How is it then, with such effective treatment of
diabetes, that the disease continues to take such a
toll in sickness and death?

> Treating diabetes is like waging a prolonged
> war: it is possible to lose some of the battles,
> but the war must be won. Diabetes is ever pre-
> sent and the patient must be treated not only
> for now but for the future. (Krall, 1978, p.
> 41)

Many authorities place the blame on the phenomenon
of noncompliance with the therapeutic regimen (Bille,
1977b; Caplan, Robinson, French, & Shinn, 1976; Davidoff,
1976; Komaroff, 1976; Podell & Gary, 1976; Weinstein &
Stason, 1976; Zanchetti, 1977). The necessity of com-
plying with the diabetic therapeutic regimen is obvious.

Discovering that a person has diabetes and prescribing a regimen is not, in itself, enough. The benefits of therapy will not be realized and complications will not be minimized unless the diabetic patient remains under medical care, keeping physician appointments, and following therapeutic regimen regularly.

The phenomenon of noncompliance has come under increasing study as it has appeared to be of great importance in the failure to achieve treatment goals. This emphasis on noncompliance is evident by the number of articles, studies, and reports to be found in the literature. Much has been written concerning the problems involved when patients fail to comply with their prescribed therapeutic regimen.

One of the major problems in determining the extent of noncompliance is difficulty in obtaining objective measures of adherence to therapeutic regimen. Objective measures, such as medications that can be detected in the blood or urine, are expensive to use. In 1975, Haynes and Sackett (cited in Haynes, 1976) examined 185 studies on the compliance of patients with therapeutic regimens. It was found that 8% did not have a replicable definition of compliance; while 42% had a vague

definition, and 51% contained a definition determined to be replicable. Various types of compliance measures used in the 185 studies included the following: subjective measures in 35%, objective indirect measures in 30%, immediate direct measures in 24%, and objective direct measures on a longitudinal range in 10%. Many studies were limited to studying physiologic and demographic factors which might influence taking medication. Sackett and Haynes (cited in Haynes, 1976) found that demographic factors seemed to have a greater effect on access to health care than on the compliance of patients under treatment. In regard to age, 30 studies found no relationship between age and noncompliance, while 7 studies found greater noncompliance in older age groups. The majority of studies found no association between sex, education, socioeconomic status, marital status, race, or religion and noncompliance.

Gillum and Barsky (1974) focused their study on the importance of family encouragement to maintain compliance. Family instability and living alone were associated with noncompliance. These authors recommended that the management of noncompliance include family support through the use of social service agencies if

necessary. Caplan et al. (1976) found that support from the spouse and the physician were both important to compliant patients. Compliance correlated positively with high self-competence and high self-esteem.

In response to the belief that the therapeutic regimen itself may affect noncompliance, Gillum and Barsky (1974) suggested ways of noncompliance management related to the therapeutic program. Patient involvement in planning the program was recommended. Also, education programs that allow for active patient participation were suggested.

Much effort has been spent in attempting to discover causes of noncompliance as well as to find interventions that serve to increase compliance. It is clear from the research that there is no single, simple cause nor cure for the problem of noncompliance.

Basic to the issue is the question of whether noncompliance is a patient-related phenomena altogether or one in which the health practitioner has an important role. Some health practitioners and social scientists have believed that the greatest part of the noncompliance problem can be explained in terms of patients' perseverance, ignorance, or uncooperativeness (Davis, 1966;

Podell & Gary, 1976). Increasingly, however, the
literature (Davidoff, 1976; Davis, 1966; Haynes, 1976;
Komaroff, 1976; Marston, 1970; Peoples-Veiga, 1976;
Podell & Gary, 1976; Weintraub, 1975) has advised the
health practitioner that he is indeed responsible in
this area if only because research has determined that
compliance does, in fact, improve in a good patient-
health practitioner relationship.

Cooper (1975), Davidoff (1976), Hulka, Cassel,
Kupper, and Berdette (1976), Jones (1976), Podell and
Gary (1976), Stewart and Cluff (1972), and Weintraub
(1975) indicated that the problem of noncompliance rests
with the misunderstanding of the prescribed regimen and
a poor patient-health practitioner relationship. Hulka
et al. (1976) wrote that much of what has been labeled
patient noncompliance may be inadequate communication
between the patient and physician. The point has been
made that the patient may be complying well with what
he/she thinks is his/her prescribed regimen, but will
be found noncompliant when studied because he/she has
misunderstood the prescription (Hulka et al., 1976;
Jones, 1976).

Many other factors concerning noncompliance have
come to light in the process of scientific investigation.

A number of studies found that knowledge of the disease and treatment had no relationship whatsoever to compliance with the prescribed therapeutic regimen (Bille, 1977b; Haynes, 1976; Marston, 1970; Podell & Gary, 1976; Weintraub, 1975). Although studies have shown a positive correlation between level of education and compliance, a few have shown a negative correlation (Bille, 1977a), and most have shown no association (Haynes, 1976; Marston, 1970). Again, several studies (Bille, 1977b; Morrow & Rabin, 1966) have shown that older patients tend to comply better than younger patients, but Haynes (1976) found that the majority of studies showed no association. Marston's (1970) review agreed with that of Haynes (1976). Sex, socioeconomic status, religion, and marital status were not found to have any effect, overall, on compliance with the therapeutic regimen (Haynes, 1976; Marston, 1970). Haynes (1976) also reported no overall association between compliance and income, occupational status, or race.

Given, Given, and Simoni (1979) examined relationships between process and outcome components of patient care. Patient compliance level was found to be the most significant process variable.

> Compliance with therapeutic regimens was
> significantly related to patients' clinical
> outcome health state as well as to their
> knowledge and perceptions of the disease and
> its therapy. (Given et al., 1979, p. 92)

These findings clearly document that compliance is closely associated with patients' knowledge and perceptions of their disease and its therapy.

Most of the literature directed toward the management of diabetes mellitus addressed the importance of educating the patient to the disease. Education is not an addition to the treatment but the treatment itself. Diabetic patients must be taught the fundamentals of diet, technique of insulin injection, treatment of low and high blood levels, urine testing, and skin and food care. Krall (1978) stated "that those long-term diabetics who have survived best are those who knew the most" (p. 126). Educational interventions might eliminate misunderstandings and motivate, re-instruct, and support the diabetic patient.

Duration of illness has been found by Haynes (1976) to have almost equally a negative correlation with compliance (six studies). Five studies found no association with compliance. Vincent's (1971) study of glaucoma patients' compliance with eye drop treatment found that

the group with the least education showed the highest percentage of compliers and the lowest percentage of compliers was found in the group that had gone beyond the eighth grade, but had not graduated from high school. Although those who had graduated from high school did not tend toward compliance, there were more compliers in this group than in that from 8th through 12th grade.

Support of significant others has been shown to be positively correlated with compliance (Haynes, 1976; Komaroff, 1976). Caplan et al. (1976) found that support from the physician and the spouse was important in compliant patients. Compliance also was found to be positively correlated with high self-competence and high self-esteem.

A good physician-patient relationship is of great importance to the success of any long-term therapeutic program. Long-term follow-up in order to see that adequate and continuous therapy is being maintained is of equal importance. The concerned physician will explain the therapeutic regimen to be established. Sackett (1976) stated that patients cannot comply with a prescribed regimen unless they understand it. The role

of the patient-health practitioner appeared to be the richest area for the growth of compliance.

Podell and Gary (1976) stated that "compliance was substantially improved by providing personalized, continuous, convenient, and courteous medical care" (p. 78). This appeared to accurately summarize the recommendations of Bille (1977b), Davidoff (1976), Finnerty (1974), Komaroff (1976), and Peoples-Veiga (1976). Many prescriptions and interventions for increasing compliance have been determined from the various factors found to be responsible for noncompliance.

Steckel and Swain (1977) reported a new method of coping with noncompliance and improving compliance by use of contracts with patients. In studying 115 hypertensive patients, Steckel and Swain utilized patient education plus a contingency contract with the patient. Compliance was shown to be significantly improved by the decrease in blood pressure, greater weight less, and more kept clinic appointments. Community health nurses have found this method quite useful with diabetic patients. Contract strategy is based on behavior modification theory.

Sackett (1976) combined teaching with behavioral strategies and found a significant increase in compliance

6 months later. Behavioral strategies were found to be involved in the developing of a program according to the individual's habits and the use of a lay person in rewording the individual for compliant behavior.

"Diabetes is the ultimate in patient-management diseases, since the patient controls all the variables affecting his disease" (Peterson, 1979, p. 22). There is a great responsibility on the part of the physician and health team and an overwhelming need on the part of the patient for reassurance that one is controlling the disease correctly.

Diabetes is high among diseases where noncompliance is a significant problem. The time, effort, and money involved in providing the type of care designed to reduce noncompliance can be very expensive. It becomes important to find ways to predict as early as possible the noncompliant group (Marston, 1970) so that interventions to promote compliance may be focused on them, both for financial and medical benefits.

Locus of Control

Locus of control is a personality construct emerging from social learning theory which developed in the 1940s and 1950s, primarily from the work of Rotter.

The social learning theory is described as a molar and multivariate approach to complex behavior, and its purpose is the prediction of behavior and the internal or cognitive process associated with behavior (Rotter et al., 1972). Social learning theory has been regarded as an integration of stimulus-response theories and cognitive or field theories and Rotter et al. have acknowledged the influences of Adler, Kanter, and Lewin (cited in Rotter et al., 1972) in their work.

The four major concepts of social learning theory are: (a) behavioral potential, (b) reinforcement value, (d) expectance, and (d) the psychological situation. Behavior potential is a relative concept in which the potentiality for a behavior to occur in a given situation is calculated in relation to a given reinforcement. Behavior includes not only overt but also nonobservable processes such as rationalizing, planning, and repressing (Rotter, 1966).

Reinforcement value refers to the degree of the individual's preference for a reinforcement to occur, if the possibilities of occurrence of all alternatives are equal. Reinforcements may, to a certain extent, change value depending on the situation and conditions

in which the individual finds himself, but it is very
important, within Rotter's framework to determine the
value of the reinforcement to the individual. Rotter
distinguished between internal reinforcement, the per-
son's perception that a meaningful event has occurred
which has value for him; and external reinforcement,
occurrences of events which have reinforcement value
for a group to which the person belongs. Thus, an
individual perceives himself as internally controlled
when events are contingent upon his own behavior, or
externally controlled when events result from luck,
chance, or control of powerful others (Rotter et al.,
1972). Expectancy refers to the

> expectancy for behavior-reinforcement sequences
> and is seen as a subjective probability held by
> the individual that a particular reinforcement
> will occur as a function of a specific behavior
> on his part in a specific situation. (Rotter
> et al., 1972, p. 24)

The psychological situation refers to the internal
and external environment to which a person constantly
reacts. This concept acknowledges that behavior is
motivated and does not occur in a vacuum. It recognizes
that individuals react specifically to different stimuli
in their internal and external environment.

Expectancy and reinforcement value are independent of each others and behavior potential is seen as a function of both those concepts. Therefore, "behavior potential is higher when expectancy and reinforcement value are both high, or when one is high and the other is moderate, than when both are low" (Rotter et al., 1972, p. 16). Changes in either of these two variables can bring about changes in behavior, but changes in reinforcement values are considered to be more difficult to make.

Lefcourt (1976) stated:

> The potentiality of occurrence of a set of behaviors that lead to the satisfaction of some need (need potential) is a function of both the expectancies that these behaviors will lead to these reinforcements (freedom of movement), and the strength or value of these reinforcements (need value). (p. 27)

Need potential refers to groups of similar behaviors rather than single behaviors. Need value is a broader perspective of reinforcement value where a set of related reinforcements is preferred over another set. Freedom of movement can be described as a fairly stable generalized expectancy of success based on an individual's past behavior or outcome sequences. It follows that high freedom of movement is enjoyed when an

individual feels that one's behaviors will result
in successful achievement of goals. If low freedom
of movement occurs, especially when the need value
is high, the individual may expect failure or punish-
ment. A minimal goal is the lowest point in the con-
tinuum of possible reinforcements in a given situation
that will be perceived by the individual as satisfactory
(Rotter et al., 1972).

Reinforcement (freedom of movement) is concerned
with the likelihood of success, whereas locus of control
is concerned with a causal determination of both suc-
cess and failure (Lefcourt, 1976). Locus of control
relates to the individual's interpretation of one's
interactions and experiences and the individual's beliefs
about whether the outcomes are dependent on one's own
behaviors or on external circumstances (Lefcourt, 1976).
Rotter's (1966) description of the concept is as follows:

> When a reinforcement is perceived by the subject
> as following some action of his own but not being
> entirely contingent upon his actions, then, in
> our culture, it is typically perceived as the
> result of luck, chance, fate, as under the con-
> trol of powerful others, or as unpredictable
> because of the great complexity of the forces
> surrounding him. When the event is interpreted
> in this way by an individual, we have labeled
> this a belief in external control. If the per-
> son perceives that the event is contingent upon

his own behavior or his own relatively per-
manent characteristics, we have termed this
a belief in internal control. (p. 1)

Numerous studies have investigated the importance
of the concept of locus of control. Rotter (1966)
demonstrated that when a person perceived himself as
internally controlled, he would more likely make greater
attempts to master his environment; to be more resistant
to the influence of others; to be higher in achievement
motivation; to place higher values on skill-determined
rewards; to act more responsively to probability changes
in the situations; and to be more involved in social
action.

Lowery and DuCette (1976) investigated the relation-
ship between the individual difference variable, locus
of control, and patient's response to diabetes. Lowery
and DuCette predicted that internal diabetics would
know more about their disease and would, therefore,
demonstrate more control over it. The restuls from
the study found internal diabetics to have more diabetic
information but this advantage over externals decreased
as the duration of illness increased. Internal diabetics
seemed to incur more problems with their disease than
externals as the disease progressed.

Locus of control may be understood better if the
related concepts are looked at, including the acknowl-
edgement that subjects' behavior is related to task
differences along an area of skill and chance. Rotter
(1966) cited the 1955 studies of Goodnow and Pettigrew,
Goodnow and Postman, and Wyckoff and Sidowski who found
that probabilistic learning theory was not suitable
when the subjects no longer felt that the task was a
matter of chance. Phares (1957) found that reinforce-
ments in skill tasks had a greater effect on raising
or lowering expectancies for future reinforcements,
and also found unusual changes in expectancies, "the
gambler's fallacy" under chance conditions. This in-
volved feelings of increased chances of success following
failure, or failure following success.

Another variable which may have some relationship
to internal-external control is that of need for achieve-
ment. Individuals who have a high need for achievement
may have some belief in their own ability or skill to
determine the outcome of their efforts (Rotter, 1966).
Rotter (1975) also found that in early grades, achieve-
ment was related to control, but that this finding
diminished and was no longer apparent in the relationship

of locus of control to college entrance tests. Rupp and Nowicki (1978) in a study of Hungarian children found higher school achievement positively correlated to an internal locus of control. Shavit and Rabinowitz's (1978) study of Israeli children showed that internals coped more effectively with failure than did externals, and their perceived competence following failure did not decrease in comparison with externals.

The earliest reference to cognitive activity was presented in two frequently cited articles by Seeman and Evans (1962) and Seeman (1963). In these studies it was found that hospitalized tubercular patients who were considered internal knew more about their illness than external patients. In another reviewed article, it was described how internal reformatory inmates demonstrated superiority over external inmates in the utilization of information (Lowery & DuCette, 1976). Lefcourt (1976) described internal individuals as being more cognitively alert.

Wallston and Wallston (1978) reported that several studies showed that internals were more likely to engage in behaviors that facilitate physical well-being. James, Woodruff, and Werner (1965) replicated a study done by

Straits and Sechrest (cited in James et al., 1965) and found that nonsmokers were more likely to be internal than smokers. James et al. also found that males who believed Surgeon General's Report and quit smoking were more internal than those who believed the report but did not quit smoking.

MacDonald's (1970) research on locus of control and use of birth control showed that among single female college students, 62% of the internals reported practicing contraception, while only 37% of the externals did so. The data results on married females were in the same direction but were not statistically significant (Wallston & Wallston, 1978). Among three samples of females, Phares (cited in Wallston & Wallston, 1978) found that "girls attending a compulsory industrial school were less likely to use contraceptives, although they reported a high degree of sexual activity" (p. 108).

Harkey and King (1976) collected data on unwed mothers, abortion patients, and users of some form of birth control. The results from this research "showed no difference in locus of control between abortion patients and users of birth control" (p. 108) with

both groups scoring more internal than female norms
(Wallston & Wallston, 1978). More recent research
has failed; however, to confirm these findings on locus
of control and contraceptive use.

As more and more research is reviewed about internal-
external locus of control, it becomes clear that internal
control appears associated with desirable attributes,
and external control with undesirable ones. This assump-
tion is one that both Rotter (1975) and Lefcourt (1976)
cautioned against. However, Rotter (1971) left this
impression when he said about internal-external indivi-
duals that:

> Some people are confident that they control them-
> selves and their destinies. They tend to be
> surer of themselves, richer and better-educated,
> and to be more readily able to quit smoking.
> They are internals. Other persons feel that
> their fates are in the hands of powerful others,
> that they are pawns, and they tend to be docile
> and suspicious. They cry a lot. They are ex-
> ternals. (p. 37)

It is evident that many events are beyond any person's
control. Lefcourt (1976) stated that locus of control
is more accurately viewed as

> a circumscribed self-appraisal pertaining to
> the degree to which individuals view themselves
> as having some causal role in determining speci-
> fied events rather than a character trait perme-
> ating all of an individual's actions attempts.
> (p. 141)

Rotter (1975) also talked about a limit to personal control, and he stressed that internal-external control orientation is not distinct, but must be seen as a continuum. Rotter (1975) and Lefcourt (1976) both stressed that locus of control is not a fixed trait or characteristic to be revealed within an individual, but rather an instrument allowing for an interpretation of stated beliefs of individuals about causality. Lefcourt (1976) showed evidence that perception of control scores shift with relevant environmental events.

Kilmann, Laval, and Wamlass (1978) noted the importance for educators and counselors to "promote an internal locus of control orientation as a preventive and remedial approach to adjustment problems" (p. 512). Lefcourt (1976) believed that studies of therapeutic approaches designed to change locus of control were too optimistic, due to poorly controlled variables.

Phares (1957) developed the first scale for the assessment of an individual's locus of control. In 1966 Rotter published the Internal-External (I-E) Scale noting that credit for it must be shared by many who had worked with him. Joe (1971) reported that Rotter's I-E Scale is not as free of social desirability as Rotter claims.

Hersch and Scheibe (1967) noted that internals were more homogenous in test performances, and implied that externality should be differentiated. Levenson (1974) described refinements on Rotter's scale that would eliminate some of the inconsistencies found in the research. These involved a tripartite differentiation into internal, powerful other, and chance orientations. Levenson (1974) stated:

> People who believe the world is unordered (chance) would behave and think differently from people who believe the world is ordered but that powerful others are in control. In the latter case, a potential for control exists. (p. 377)

Logadon, Bourgeois, and Levenson (1978) added validity to Levenson's (1974) multidimensional approach to locus of control. In one of their studies the differentiated chance scale proved the sole discriminator of the variable under study.

Rotter (1975) advocated the creation of specific measures within the broader locus of control construct and believed that this would be useful in research. Lefcourt (1976) also agreed that the utility of the construct would be enhanced by the development of more specific methods.

One specific area that has developed is the relationship between locus of control and health.

Wallston, Wallston, Kaplan, and Maides' (1976) study cited positive correlations in numerous studies regarding the relationship between a belief in internal control and physical health. Strickland's (1973) findings suggested that internals were more likely to take preventive measures to keep healthy and free of disease.

Rotter's (1966) instrument was too generalized to be of much use in predicting health-related behaviors in health-related situations. A health-related locus of control scale was needed to provide more sensitive predictions of the relationship between internality and health behaviors. The first scale specific to the locus of control-health relationship was developed in 1972 by Kirscht (cited in Wallston & Wallston, 1978).

Wallston, Wallston, Kaplan, and Maides (1976) developed a scale consisting of 11 items (Health Locus of Control Scale) believed to be more sophisticated, that would lead to better predictions of health behavior. The scale was used in at least 50 health studies before the developers became dissatisfied with it, partly because its alpha reliability was dropping, and partly because it was not useful in the prediction

of health behavior as they had hoped (Wallston & Wallston, 1978). The developers were also convinced that health locus of control was not a unidimensional construct. They modified the scale based on Levenson's (1974) differentiation of externality and published the Multidimensional Health Locus of Control Scale in 1978.

Because of the importance of determining the reinforcement value in Rotter's Theory, the developers of the Multidimensional Health Locus of Control Scale also administered a Value Scale. They used a shortened and modified version of Rokeach's 1973 Value Survey. This permits projection of the respondent's internalized values (including health) so that they may be taken into account when utilizing both of these scales. Many studies suggest that there is evidence that locus of control construct is relevant to the prediction of health behaviors and sick-role behaviors; however, the relation between compliance with medical regimen and locus of control is still unclear.

Summary

The three major areas of concern to this study have been examined in some detail. In the first section, diabetes was examined as a disease and in terms of its

impact on society. The second section described non-compliance with therapeutic regimen as being the principal problem among diabetics today. The third section examined the concept of locus of control in terms of its origin and interpretation, including health locus of control, in the hope of finding it to be a predictor of noncompliance.

CHAPTER 3

PROCEDURE FOR COLLECTION AND
TREATMENT OF DATA

This was a descriptive ex post facto study. The independent variables were the patients' locus of control beliefs and the value they placed on their health. The dependent variable was the rate at which they kept their clinic appointments. The method used was a survey to measure the independent variables and record analysis to measure the dependent variable. No variables were manipulated by the investigator.

Setting

This study was conducted in the diabetic outpatient clinic of a large, nonprofit, county hospital in the Southwest. The hospital, which has approximately 800 beds, operates 87 outpatient clinics which, in 1980, counted 218,283 patient visits with a daily average of 857. The patients seen were largely lower socioeconomic level Blacks and Hispanics, many of whom were receiving governmental aid. However, an increasing number of private pay patients were being seen in the outpatient clinic.

Population and Sample

The population of this study consisted of adult diabetics between the ages of 21 to 65 years. The sample consisted of 40 male and female diabetics between the ages of 21 to 65 years, who were literate, had two or more scheduled appointments, and who had attended the diabetic clinic for at least the preceding 6 months. The minimum age of 21 years was established because the Health Locus of Control Scale was developed for an adult population. The maximum age was set in an attempt to exclude older patients with multiple complications. The sample was considered accidental because it was the most readily available or most convenient group. The first 40 subjects who met the delimitations, and who consented to participate in the study, made up the sample.

Protection of Human Subjects

To protect the rights of the participants, the proposal for the study was reviewed and approved by the Texas Woman's University Human Research Review Committee (Appendix A) and the graduate school (Appendix B). Agency approval (Appendix C) was obtained before patients were approached for participation. Each participant was requested to sign an informed consent form

form (Appendix D) showing evidence of his/her willing participation in the study. The participants were assured that all names would be kept confidential and not released in any of the data. The investigator kept code numbers for all questionnaires answered together with the participants' names and clinic information regarding scheduled and kept appointments. After the data were matched, the identifying information was destroyed.

Instruments

Three instruments were used in this study. They were: (a) the Health Locus of Control Scale (HLC), (b) the Value Scale, and (c) a demographic questionnaire.

The Health Locus of Control Scale (Appendix E) is an area-specific measure of expectancies regarding locus of control. Permission (Appendix F) was obtained from the authors for operationalizing health-related locus of control beliefs. The Health Locus of Control Scale has a 6-point, Likert-type format with 11 items that are scored in the external direction. Each item is scored from 1 (strongly disagree) to 6 (strongly agree) for the externally worded items and reverse scored for

the internally worded items. The externally worded items (numbers 2, 4, 5, 9, and 10) are scored as the number circled by the subject. The internally worded items (numbers 1, 6, 8, and 11) are reverse scored (i.e., subtract the circled number from 7 so that 1 becomes 6, 2 becomes 5, and so on). The total HLC score consisted of the sum of the 11 items scored as above. High scores reflect external health locus of control beliefs (Wallston, Wallston, Kaplan, & Maides, 1976). The scale is written in the personal mode and is geared toward an eighth grade reading level.

According to Wallston, Wallston, Kaplan, and Maides (1976), two studies

> offer preliminary evidence of the construct
> validity of the HLC Scale and demonstrate the
> functional utility of using an area-related
> measure of locus of control over the mere
> generalized I-E Scale. (p. 584)

Wallston, Wallston, Kaplan, and Maides (1976) also stated that

> much more research is necessary to determine if a
> measure such as the HLC is an effective compromise
> for health researchers between relying solely on
> very general indicators of locus of control beliefs
> and having to develop a new tool for each new situa-
> tion. (p. 585)

The Health Locus of Control Scale yields interval data. This data were broken down into nominal data

according to the subjects' responses. Often in tests such as the HLC, a median split test, a number of subjects will cluster around the median. The result is that subjects who are barely external will be classified in the same group as those who are highly external, thereby introducing variation into the sample. To minimize this problem, those subjects whose scores were more than 1 point above the median were placed in the external group and those that scored more than 1 point below the median were placed in the internal group. Subjects in the range plus or minus 1 point from the median were not considered in the data analysis.

Because of the crucial role of reinforcement value inherent in Rotter's social learning theory, the Value Scale (Appendix G) modified by Wallston and Wallston (1978) from Rokeach's (1973) Value Survey was used. The 1973 Value Survey consisted of 18 alphabetically arranged terminal values and 18 alphabetically arranged instrumental values, each with a brief definition in parenthesis. The respondent was asked to arrange them in the order of priority, thus projecting one's internalized system of values. With subsequent retesting, value system stability or change could be studied. Rokeach (1973) obtained test-retest reliabilities of .74 for

terminal values and .65 for instrumental values using
Form E, which most closely resembles the Wallston and
Wallston modification.

Wallston and Wallston (1978) used only the terminal
value list, omitted 9 items, and added health for a
total of 10 alphabetically arranged values each with
a brief definition in parenthesis. Again, the respon-
dent was asked to rank these from 1 to 10 in order of
the importance of these values. In the study, the sub-
jects who ranked health as number one were classified
as having high health value and all others were classi-
fied as low health value. Although no validity or
reliability studies were located, Wallston and Wallston
(1978) stated that reliability would be as high as in
Rokeach's (1973) original test.

The subjects were asked to check the appropriate
categories on the demographic data sheet (Appendix H)
to elicit data on age, sex, race, and duration of dia-
betes. The information from the demographic question-
naire was used to describe the sample.

Data Collection

The Health Locus of Control Scale, Value Scale, and demographic data questionnaires were administered to all patients who met the sample delimitations as previously described. Patients who had scheduled appointments at the diabetic outpatient clinic, which meets weekly on Wednesday mornings, were approached by the investigator as they waited for their prescriptions and return appointment slips. The investigator returned on three consecutive Wednesday mornings until 40 subjects had agreed to participate.

A verbal explanation (Appendix I) of the study was given to each patient who agreed to participate. The participants were asked to sign the consent form and to give the investigator permission to review the individual's clinic records for scheduled and kept appointments.

Questionnaires were read to or by each participant and questions concerning the procedures were answered. The investigator administered the instruments to each subject individually in a small area outside of the diabetic clinic waiting room.

After the questionnaires were completed, the investigator collected the information on the number of appointments scheduled and kept from the corresponding clinic records. Compliance was inferred from the percentage of appointments the patient kept during the preceding 6 months.

Treatment of Data

Two independent variables, health locus of control and health value, and one dependent variable, percentage of appointments kept, were measured. Two variables, age and duration of illness, were controlled statistically. The analysis of covariance test was used to test the hypotheses. Since the hypotheses were directional, a one-tailed test was used. Analysis of covariance tests the significance of differences between group means after first adjusting the scores on the dependent variable to eliminate the effects of the covariates, age and duration of illness.

Age was controlled because of its possible effect on the ability of patients to keep appointments. Duration of illness was also controlled in the possibility that long-term patients may tend to miss appointments at a higher rate. Sackett and Haynes (1978), after

extensive research, found inconclusive evidence that these variants effect patients' compliance.

The arc-sine transformation was used to normalize the dependent variable. Winer (1972) stated that if the observations are proportions, then the means and variances are correlated. The arc-sine transformation was used to stabilize the variance which allowed parametric statistics to be used. Level of significance was set at the .05 level. These computations were made on the computer at Texas Woman's University using the Statistical Package of Social Science.

CHAPTER 4

ANALYSIS OF DATA

This chapter describes the demographic characteristics of the sample. The data findings after statistical analysis and summary of the findings are also presented.

The purpose of this study was to test the application of social learning theory to a health-specific situation. It was hypothesized that adult diabetics with internal health locus of control beliefs and high health values would keep a higher percentage of clinic appointments than adult diabetics with internal health locus of control beliefs and lower health values and diabetics with external health locus of control beliefs regardless of their health values, when age and duration of illness were controlled. According to Rotter's social learning theory, an individual is more likely to engage in a behavior if he values the results of that behavior and if he perceives the outcome as dependent on his own action. Health-related measurements were used to measure three variables: health locus of control, relative value placed on health, and the percentage of scheduled and kept clinic appointments.

Description of Sample

The sample of 40 subjects was obtained from one location, the diabetic outpatient clinic of a large Southwestern county hospital. Each subject completed a demographic data form, the Health Locus of Control Scale, and the Value Scale. Each subject's chart was reviewed for scheduled and kept clinic appointments. The subjects were divided into three groups according to their scores on the Health Locus of Control Scale and Value Scale. Those subjects whose scores were more than 1 point above the median were placed in the external group and those that scored more than 1 point below the median were placed in the internal group. Those subjects who scored in the range median plus or minus 1 point were not considered in the data analysis. Eight subjects clustered in the range and were thus omitted from the sample. The median score for this sample was 38.

One group (n = 11) of subjects had internal health locus of control beliefs and high health values. A second group (n = 6) of subjects had low health values and internal health locus of control beliefs. A third group (n = 15) of subjects included all those with an

external health locus of control beliefs regardless of their health value. Thus, 32 subjects provided the data for testing Hypothesis 1 and Hypothesis 2.

The analysis of covariance procedure was used to test the hypotheses, controlling for age and duration of illness. The arc-sine transformation was used to normalize the dependent variable, percentage of appointments kept. Computations were made on the computer at Texas Woman's University using the Statistical Package of Social Science. A significance level of .05 was utilized throughout.

Of the 32 subjects, Black females comprised 34% (11), Black males comprised 19% (6), Caucasian females accounted for 34% (11), and Caucasian males accounted for 3% (1). There were 2 Hispanic males accounting for 6% and 1 Hispanic female, accounting for 3%. Females comprised 75% (23) of the sample. The distribution of the sample by sex and race is presented in Table 1.

Nineteen percent (6) of the subjects were 21 to 30 years of age; 22% (7) were 31 to 40 years of age; 12% (4) were 41 to 50 years of age; 31% (10) were from 51-60 years of age; and 16% (5) were 61 to 65 years of age. Twelve percent (4) of the subjects reported a duration of

Table 1

Distribution of the Sample by Sex and Race

Race or Ethnic Group	Gender				Total Sample	
	Male		Female			
	Number	%	Number	%	Number	%
American Indian	0	0	0	0	0	0
Caucasian	1	3	11	34	14	37
Hispanic	2	6	1	3	3	9
Negro	6	19	11	34	17	53
Oriental	0	0	0	0	0	0
Other	0	0	0	0	0	0
Totals	9	28	23	71	32	100

less than 1 year, while 22% (7) of the subjects had been diagnosed diabetic from 1 to 5 years. Twenty-eight percent (9) of the subjects had a duration of 6 to 10 years, with 22% (7) of the subjects having a duration 11 to 15 years. Nine percent (3) of the subjects had a duration of 16 to 20 years, and 6% (2) of the subjects reported being diagnosed as diabetic for 21 years or longer.

Fifty-nine percent (19) of the subjects ranked health number 1 on the Value Scale and were classified as having high health values. Forty-one percent (13) of the subjects did not rank health as number 1 and were classified as having low health values. Sixteen percent (5) ranked health as number 2, 8 ranked health numbers 3 and 9, and 1 subject ranked health number 10.

Of the 32 subjects, 56% (18) kept 100% of their clinic appointments over the 6-month period, 9% (3) kept 80%, 16% (5) kept 60%, 12% (4) kept 50%, 3% (1) kept 40%, and 3% (1) kept only 25% of appointments. The average number of appointments scheduled was three.

Health Locus of Control Scale scores ranged from 24 to 50, with a median of 35. Of the 32 subjects, 42.5% (17) were classified as internals, and 37.5% were

classified as externals. Twenty percent (8) of the subjects clustered around the median and, therefore, were not used in the data analysis.

Findings

Analysis of covariance was used to test the hypotheses. This parametric procedure tested the significance of differences between the group's means after first adjusting the scores on the dependent variable to eliminate the effects of the covariates and to equalize the groups. According to Polit and Hungler (1978), "analysis of covariance can adjust for initial differences so that the final analysis will reflect more precisely the effect of the experimental intervention" (p. 580). The adjustment of scores utilized regression procedures.

Hypothesis 1 stated: Adult diabetics who have had the disease for at least 6 months, who hold internal health locus of control beliefs, and have high health values will keep a higher percentage of their clinic appointments than adult diabetics who have internal health locus of control beliefs and have low health values, when age and duration of illness are controlled. Seventeen subjects provided the data to test Hypothesis 1. Subjects with internal health locus of control

beliefs and high health values ($\underline{n}$ = 11) kept 82.6% of their scheduled clinic appointments while subjects with internal locus of control and lower health values ($\underline{n}$ = 6) kept 73.7% of their appointments. Although the percentage of kept appointments was in the direction predicted, the computed $\underline{F}$ (1, 16) = 1.54, $\underline{p}$ = 0.12 did not reach significance at the .05 level.

The computed $\underline{F}$ (1, 16) = 0.18, $\underline{p}$ = .68 associated with the covariate, duration of illness, was not significant at the .05 level. The computed $\underline{F}$ (1, 16) = 5.88, $\underline{p}$ = .015 associated with the covariate, age, indicated that age had a significant effect on the percentage of appointments kept by the subjects who held internal health locus of control beliefs. Those internal subjects under 40 years of age kept a significantly higher percentage of appointments ($\underline{n}$ = 9, $\underline{\bar{X}}$ = 86) than those internal subjects 41 years of age or older ($\underline{n}$ = 8, $\bar{X}$ = 72). The data did not support Hypothesis 1. It was concluded that internals with high health values did not keep a higher percentage of clinic appointments than those internals classified with low health values (Table 2).

Hypothesis 2 stated: Adult diabetics who have had the disease for at least 6 months, who hold internal health

Table 2

Analysis of Covariance of Kept Clinic
Appointments of Internals by
Health Value

Source of Variation	Sum of Squares	df	Mean Square	F	Significance of F
Duration	27.78	1	27.78	0.18	0.34
Age	889.88	1	889.88	5.88	0.015
Group	232.74	1	232.74	1.54	0.15
Residual	1968.76	13	151.44		
Total	3092.12	16	193.26		

locus of control beliefs, and have high health values will keep a higher percentage of their clinic appointments than adult diabetics who hold external health locus of control beliefs regardless of their health values when age and duration of illness are controlled. Twenty-six subjects provided the data to test Hypothesis 2. Subjects with internal health locus of control beliefs and high health values (n = 11) kept 82.6% of their clinic appointments while the subjects with external health locus of control beliefs regardless of their health values (n = 15) kept 74.8% of their clinic appointments. The computed F (1, 25) = 7.90, p = .005 was significant indicating the data supported Hypothesis 2. Duration of illness and age had no effect on the percentage of appointments kept (Table 3).

Summary of Findings

The data analysis indicated that adult diabetics with internal locus of control beliefs and high health values did not keep a significantly higher percentage of clinic appointments than diabetics with internal locus of control beliefs and lower health values. The F value comparing internals with high health values to internals with lower health values was not significant, indicating

Table 3

Analysis of Covariance of Kept Clinic Appointments of Internals with High Health Values and Externals Regardless of Health Values

Source of Variation	Sum of Squares	df	Mean Square	F	Significance of F
Duration	243.58	1	243.58	1.39	0.13
Age	138.75	1	138.75	0.79	0.19
Group	1387.39	1	1387.39	7.90	0.005
Residual	3859.33	22	175.42		
Total	5703.85	25	228.15		

that the differences between the groups could be attributed to chance factors. The covariate, age, had a significant effect on the percentage of appointments kept by the adult diabetics who held internal health locus of control beliefs. The internal adult diabetics under 40 years of age kept a significantly higher percentage of appointments than those internal subjects 41 years of age or older. Adult diabetics with internal locus of control beliefs and high health values did keep a significantly higher percentage of clinic appointments than diabetics with external locus of control beliefs regardless of their health values.

CHAPTER 5

SUMMARY OF THE STUDY

This chapter summarizes the results of the study, discusses its implications, and makes recommendations for further study. The study was conducted to determine whether social learning theory concepts could be used to predict patients' rate of adherence to prescribed medical regimen.

The two hypothesis for this study were:

1. Adult diabetics who have had the disease for at least 6 months, who hold internal health locus of control beliefs, and have high health values will keep a higher percentage of their clinic appointments than adult diabetics who have internal health locus of control beliefs and have lower health values when age and duration of illness are controlled.

2. Adult diabetics who have had the disease for at least 6 months, who hold internal health locus of control beliefs, and have high health values will keep a higher percentage of their clinic appointments than adult diabetics who hold external health locus of

control beliefs, regardless of their health values when age and duration of illness are controlled.

Summary

The sample was obtained from the diabetic out-patient clinic of a large, nonprofit, county hospital in a Southwestern city of over 1,000,000 people. The convenience sampling method was utilized to select subjects from those patients conforming to the delimitations set forth. The population for the study consisted of adult diabetics between 21 and 65 years of age. The sample consisted of 32 male and female diabetics who were literate, had two or more scheduled appointments, and attended the diabetic clinic for at least the preceding 6 months.

The Health Locus of Control Scale (HLC) developed by Wallston, Wallston, Kaplan, and Maides (1976) and the Health Value Scale modified by Wallston and Wallston (1978) from Rokeach's (1973) Value Survey, were used. Utilizing a chart review, the investigator recorded the scheduled and kept appointments of each subject.

The subjects were placed into three groups according to the results from the Health Locus of Control

Scale and Value Scale. The groups were: (a) internals with high health values, (b) internals with low health values, and (c) externals regardless of their health values. The analysis of covariance procedure was used to test the hypotheses.

Internals with high health values did not keep a higher percentage of appointments than internals with low health values. The covariate, age, had a significant effect on the percentage of appointments kept by subjects who held internal health locus of control beliefs. The internal subjects under 40 years of age kept a significantly higher percentage of appointments than those internal subjects 41 years of age or older. Internals with high health values differed at the .05 significance level from externals regardless of their health values in percentage of appointments kept.

Most of the subjects ranked health as number 1 on the Value Scale classifying them as having high health values. The highest percentage of subjects was in the 51 to 60 year age group while duration of illness was primarily from 6 to 10 years. The average number of clinic appointments scheduled was 3. There were 12 Caucasians, 17 Blacks, and 3 Hispanics in the study.

Discussion of Findings

Adult diabetics with internal health locus of control beliefs and high health values kept a significantly higher percentage of clinic appointments than adult diabetics with external health locus of control beliefs regardless of their health values. This finding supports social learning theory which suggests that locus of control and value of reinforcement have an interacting effect. The literature indicates that internals are more likely to engage in behaviors which tend to facilitate physical well-being (Wallston, Wallston, Kaplan, & Maides, 1976). This study indicates that health locus of control can be used as a predictor of compliance. Compliance in this study was inferred by the percentage of appointments kept. With sufficient subjects, the Health Locus of Control Scale could be useful for separating diabetics who hold internal health locus of control beliefs from diabetics who hold less responsible health values so that educational strategies may be used to influence health behavior.

More than one-half of the subjects ranked health as number 1 on the Value Scale; therefore, classifying themselves as having high health values. A possible

reason for this high ranking is that the study was conducted in a clinic setting and that medical problems made the subjects more than usually aware of the value to themselves of health. The effect of the health-related setting might have been promoted by the fact that participation was requested and assistance offered by a person in a medical uniform.

Although a large number of subjects ranked health as a high value, the data did not support the use of the Value Scale as a predictor of percentage of clinic appointments kept. The measurement of health value was not effective in discriminating relative value placed on health. The Value Scale could be made more discriminatory by using several related items for each category, thus using a composite score for each category rather than by ranking single items.

One of the findings of the present study was that age had a significant effect on the percentage of appointments kept by the subjects who held internal health locus of control beliefs. Internals under 40 years of age were found to keep a higher percentage of appointments than internals 41 years of age or older. However, the literature includes 30 studies that found no relationship

between age and noncompliance, while 7 studies found greater noncompliance in older age groups.

No specific studies were found to document the relationship of age of internals with their kept appointments. Perhaps the subjects in this study who were 41 years of age or older kept fewer appointments because of their work schedules or lack of transportation to the clinic. However, age does appear to be an important predictor of appointments kept by individuals who held internal health locus of control beliefs and further research is needed to validate these findings.

Conclusions and Implications

The following are conclusions of this study:

1. The results were consistent with social learning theory and the relationship of locus of control and reinforcement value.

2. The measurement of the independent variable value placed on health lacked specificity.

3. Age was a significant predictor of percentage of appointments kept by individuals who held internal health locus of control beliefs.

4. The value placed on health was not a predictor for compliance as measured by the percentage of appointments kept.

5. Health locus of control beliefs were a significant predictor for compliance as measured by the percentage of appointments kept.

Implications for this study are as follows:

1. Health professionals should consider developing screening programs to identify individuals with internal health locus of control beliefs, and to provide classes for those 41 years of age and older, that would involve those individuals in decisions regarding their disease control and ways to take more responsibility for their own care.

2. If adult diabetics with internal locus of control beliefs take more responsibility for behavior known to promote health, then health educational programs might be developed to reinforce these beliefs and improve compliance.

Recommendations for Further Study

Recommendations for further study include the following:

1. Repeat this study with a larger, randomly selected sample obtained from two or more locations.

2. Repeat this study with a health value scale that makes a more precise distinction between high and low health values.

3. Repeat this study with subjects who have other medical diagnoses.

4. Repeat this study with a sample of diabetics who have a record of scheduled appointments for at least 1 year or longer.

5. Repeat this study to further determine the influence of age on compliance.

APPENDIX A

TEXAS WOMAN'S UNIVERSITY
Box 23717, TWU Station
Denton, Texas 76204

1810 Inwood Road
Dallas Inwood Campus

HUMAN SUBJECTS REVIEW COMMITTEE

Name of Investigator: Shirlene Ziegler   Center: Dallas

Address: 2617 Heatherwood   Date: 11/19/80

                Dallas, Texas 75228

Dear Ms. Ziegler:

    Your study entitled Health Locus of Control and Compliance with

Scheduled Appointments

has been reviewed by a committee of the Human Subjects Review Committee
and it appears to meet our requirements in regard to protection of the
individual's rights.

    Please be reminded that both the University and the Department of
Health, Education, and Welfare regulations typically require that
signatures indicating informed consent be obtained from all human
subjects in your studies. These are to be filed with the Human Sub-
jects Review Committee. Any exception to this requirement is noted
below. Furthermore, according to DHEW regulations, another review by
the Committee is required if your project changes.

    Any special provisions pertaining to your study are noted below:

_____ Add to informed consent form: No medical service or com-
        pensation is provided to subjects by the University as a
        result of injury from participation in research.

_____ Add to informed consent form: I UNDERSTAND THAT THE RETURN
        OF MY QUESTIONNAIRE CONSTITUTES MY INFORMED CONSENT TO ACT
        AS A SUBJECT IN THIS RESEARCH.

_____The filing of signatures of subjects with the Human Subjects
Review Committee is not required.

_____Other:

XX No special provisions apply.

<div align="right">

Sincerely,

Estelle D Kurz

Chairman, Human Subjects
Review Committee

at_____Dallas_____

</div>

PK/smu/3/7/80

APPENDIX B

TEXAS WOMAN'S UNIVERSITY

DENTON, TEXAS 76204

February 16, 1981

Mrs. Shirlene Yvonne Ziegler
2617 Heatherwood
Dallas, Texas 75228

Dear Mrs. Ziegler:

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

                    Sincerely yours,

                    Robert S. Pawlowski
                    Provost

RP:dl

cc Dr. Shirley M. Ziegler
   Dr. Anne Gudmundsen
   Graduate Office

APPENDIX C

TEXAS WOMAN'S UNIVERSITY
COLLEGE OF NURSING

AGENCY PERMISSION FOR CONDUCTING STUDY*

THE___Outpatient Diabetic Clinic of Parkland Hospital____

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

> To administer a 3-part questionnaire to obtain
> information regarding beliefs on health and ill-
> ness and to review clinic records for scheduled
> and kept appointments at the diabetic clinic.

The conditions mutually agreed upon are as follows:

1. The agency (may) (may not) be identified in the final
    report.

2. The names of consultative or administrative personnel
    in the agency (may) (may not) be identified in the
    final report.

3. The agency (wants) (does not want) a conference with
    the student when the report is completed.

4. The agency is (willing) (unwilling) to allow the
    completed report to be circulated through interlibrary
    loan.

5. Other _____

Date: _12-8-80_____   _____ _12.8.80_
                           Signature of Agency Personnel

Shirlene Ziegler   _Shirley M. Ziegler Ph.D. R.N._
Signature of Student   Signature of Faculty Advisor

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

APPENDIX D

Consent Form

Consent to Act as a Subject for Research and Investigation

I hereby authorize _____Shirlene Ziegler_____ to perform the following procedures: To administer a three-part questionnaire to obtain information regarding my beliefs on health and illness and to review my clinic record for scheduled and kept appointments at the diabetic clinic. The procedures have been explained to me by _____Shirlene Ziegler_____.

I understand that the procedures described above involve few risks or discomforts, to me, these may include: (1) I may become tired when filling out the questionnaire; (2) fear that others may see the completed questionnaire; (3) fear that if I don't participate in the study my treatment at the clinic might be affected.

I understand that the following steps will be taken to protect my rights and welfare: (1) I may rest if I become tired; (2) I may take as long as I like to complete the questionnaire; (3) if I don't participate it will in no way affect my medical treatment; (4) my name will be kept confidential and will not be released with any of the data; (5) the investigator will keep a central list of a code number for the questionnaire together with my name and the information from my clinic record regarding scheduled and kept appointments, and after the data are matched, the identifying information will be destroyed; and (6) the results from the study will be available in the nursing office of the Outpatient Department if I care to review them.

I understand that by participating in the study I may be helping others to better understand and teach diabetic patients about their illness. The results from this study may help others who have diabetes to better understand their illness. I also understand that no medical service or compensation is provided to subjects by the University as a result of injury from participation in this research.

An offer to answer all of my questions regarding the study has been made. If alternative procedures are more advantageous to me, they have been explained. I understand that I may terminate my participation in the study at any time.

_____   _____
Subject's Signature   Date

APPENDIX E

HEALTH LOCUS OF CONTROL SCALE

This is a questionnaire to determine the way in which
different people view certain important health-related
issues. Each item is a belief statement with which you
may agree or disagree. Beside each statement is a scale
which ranges from strongly disagree (1) to strongly agree
(6). For each item you are to circle the number that
represents the extent to which you disagree or agree with
the statement. The more strongly you agree with the state-
ment, then the higher will be the number you circle. The
more strongly you disagree with a statement, the lower will
be the number you circle. Please circle only one number.
This is a measure of your personal beliefs; obviously there
are no right or wrong answers.

Please answer these items carefully but do not spend too
much time on any item. Be sure to answer every item.
Also, try to respond to each item independently when
making your choice; do not be influenced by your pre-
vious choices. It is important that you respond accord-
ing to your actual beliefs and not according to how you
feel you should believe.

Please answer according to the following key:
    1--strongly disagree
    2--moderately disagree
    3--slightly disagree
    4--slightly agree
    5--moderately agree
    6--strongly agree

1. If I take care of myself, I
can avoid illness.   1   2   3   4   5   6

2. Whenever I get sick it is be-
cause of something I've done
or not done.   1   2   3   4   5   6

3. Good health is largely a matter
of good fortune.   1   2   3   4   5   6

4. No matter what I do, if I am
going to get sick I will get
sick.   1   2   3   4   5   6

Please answer according to the following key:
    1--strongly disagree
    2--moderately disagree
    3--slightly disagree
    4--slightly agree
    5--moderately agree
    6--strongly agree

5. Most people do not realize the
    extent to which their illnesses
    are controlled by accidental
    happenings.   1   2   3   4   5   6

6. I can only do what my doctor
    tells me to do.   1   2   3   4   5   6

7. There are so many strange
    diseases around, that you can
    never know how or when you
    might pick one up.   1   2   3   4   5   6

8. When I feel ill, I know it is
    because I have not been getting
    the proper exercise or eating
    right.   1   2   3   4   5   6

9. People who never get sick are
    just plain lucky.   1   2   3   4   5   6

10. People's ill health results
    from their own carelessness.   1   2   3   4   5   6

11. I am directly responsible for
    my health.   1   2   3   4   5   6

APPENDIX F

GEORGE PEABODY COLLEGE *for* TEACHERS

NASHVILLE, TENNESSEE 37203

August 2, 1979

Shirlene Ziegler
2617 Heatherwood
Dallas, TX 75228

Dear Ms. Ziegler:

We appreciate your interest in the Health Locus of Control Scale, and are delighted that you would like to use it in your study.
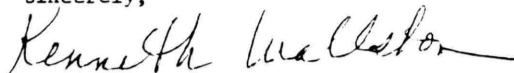
Enclosed are the articles you requested. The other article can be obtained from:

Dr. Frances Marcus Lewis
Division of Health Education
Johns Hopkins University
School of Hygiene & Public Health
615 N. Wolfe St.
Baltimore, MD 21205

When you have completed your study, we hope you will forward us your results.

If we can be of further assistance, please contact us.

Sincerely,

Kenneth Wallston, Ph.D.

KW:sc

APPENDIX G

HEALTH VALUE SCALE

Below you will find a list of 10 values listed in alpha-
betical order. We would like you to arrange them in order
of their importance to YOU, as guiding principles in YOUR
life.

Study the list carefully and pick out the one value which
is the most important for you. Write the number "1" in
the space to the left of the most important value. Then
pick out the value which is second most important to you.
Write the number "2" in the space to the left. Then con-
tinue in the same manner for the remaining values until
you have included all ranks from 1 to 10. Each value
should have a different rank.

We realize that some people find it difficult to distin-
guish the importance of some of these values. Do the
best that you can, but please rank all 10 of them. The
end result should truly show how YOU really feel.

_____ A COMFORTABLE LIFE (a prosperous life)

_____ AN EXCITING LIFE (a stimulating, active life)

_____ A SENSE OF ACCOMPLISHMENT (lasting contribution)

_____ FREEDOM (independence, free choice)

_____ HAPPINESS (contentedness)

_____ HEALTH (physical and mental well-being)

_____ INNER HARMONY (freedom from inner conflict)

_____ PLEASURE (an enjoyable, leisurely life)

_____ SELF-RESPECT (self-esteem)

_____ SOCIAL RECOGNITION (respect, admiration)

APPENDIX H

Demographic Data Sheet

Please make a check (√) in the appropriate spaces:

Age

21-30 _____   51-60 _____

31-40 _____   61-65 _____

41-50 _____

Sex

Male_____   Female _____

Race or Ethnic Group

American Indian _____   Black _____

Caucasian _____   Oriental _____

Hispanic _____   Other _____
                              (please specify)

How long have you been a diabetic?

Less than 1 year _____

1 to 5 years _____

6 to 10 years _____

11 to 15 years _____

16 to 20 years _____

21 or more years _____

APPENDIX I

Verbal Explanation to Participant

Hello, I am Shirlene Ziegler. I am a nurse who is doing a study on diabetes. I have a three-part questionnaire that I would like you to complete and there are no right or wrong answers. The questions are about what you think regarding health and illness. If you would consider answering these questions for me you may be helping nurses to better understand and teach diabetic patients about their illness. You may have family and friends that have diabetes and the results from this study may help them better understand their illness.

I would like you to sign a consent form to give me permission to administer the questionnaire and to review your clinic record for scheduled and kept appointments at the diabetic clinic.

I will keep your name confidential and will not release your name in any of the data. I will keep a central list of a code number for the questionnaire you answer together with your name and the information from your clinic record regarding scheduled and kept appointments. As soon as the data is matched, I will destroy the identifying information. You are free to withdraw from this survey at any time and if you do not participate, it will have no effect on your treatment at

the outpatient clinic. The results from the study will be available in the nursing office of the Outpatient Department if you care to review them.

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