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THE EFFECT OF A SELF DIRECTED PROGRAM ON LOCUS
CONTROL AND CONTROL OF DIABETES

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THE EFFECT OF A SELF DIRECTED PROGRAM ON LOCUS
OF CONTROL AND CONTROL OF DIABETES

by

MARY ELIZABETH BOYLE B.S.N.
II

THESIS

Presented to the Graduate Faculty of
Incarnate Word College
in Partial Fulfilment
for the degree of

MASTER OF SCIENCE
INCARNATE WORD COLLEGE

December, 1987

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by

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Mary Elizabeth Boyle

Incarnate Word College

December 4, 1987

DEDICATION

This thesis is dedicated to my uncle, Alfred P. "Doc" DiLisio who died from complications of diabetes on December 10, 1986.

To his sister and my aunt, Christine DiLisio,
a special hope that a cure is on the horizon.

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THE EFFECT OF A SELF DIRECTED PROGRAM ON LOCUS OF CONTROL AND CONTROL OF DIABETES

Compliance, as defined in the context of the medical environment, refers to the process whereby patients assume an active role in carrying out their prescribed treatments. Patients learn early in the treatment process that complying with prescribed regimens is reinforced whereas noncompliant behavior is met with frustrations and disappointments by the medical staff. In many cases, the patients are labeled as "compliant" or "noncompliant" without an adequate assessment of health care beliefs and behaviors.

In the treatment of patients with diabetes, the need to control blood sugar to prevent long term complications is supported by the literature (Pirart, 1978 & Groop et al., 1986). However it is also well documented that people with diabetes are fairly noncompliant (Cerkoney & Hart, 1980; Lawrence & Cheely, 1980; Miller, Goldstein & Nicolaisen, 1978). If this disease is so devastating, why are patients not taking care of themselves? Are their beliefs influencing the health behaviors they engage in? Have they been educated about diabetes and home glucose monitoring? Have we, as health care professionals, taken the necessary time to develop an appropriate intervention to deal with the problem of compliance?

In order to assess patients' problems with compliance, their beliefs about health and the role of health care professionals, an instrument such as the locus of control scale can be utilized. The locus of control scale, derived from Rotter's (1966) social learning theory, has the ability to predict and explain specific aspects of health care behaviors. The construct, locus of control, can be defined as the internal or external orientation that an individual has toward health care. Patients with an internal locus of control may believe they have some control over health while patients with an external locus of control may feel that their health is controlled by chance or forces outside themselves.

Unfortunately, health behaviors are usually too complex and cannot be measured by locus of control alone. Wallston & Wallston (1978) reviewed the literature and found that compliance problems are related to numerous psychosocial variables such as the social support system of the patients, the patients' previous behaviors and attitudes toward health and health professionals, demographic variables (such as race, education, social class), motivation and the costs and benefits of treatment as perceived by the patients.

Although compliance is very difficult to measure, it is the general consensus of the recent literature (Boden, Master, Gordon, Shuman, Owen, 1980; Brockway, 1981; Goldstein, Little, Wiedmeyer, England, & McKenzie, 1986; Jones et al., 1983; Jovanovic & Peterson, 1981; McMurry, 1986; Pecoraro, Chin, & Porte, 1982; Peterson, Jones,

Dupis, Levin, Bernstein & O'Shea, 1979; Service, 1986) that a simple blood test (glycosolated hemoglobin) can be utilized to measure blood glucose control with a relative degree of accuracy. This test measures how much sugar is collecting around the red blood cell and can be repeated every two to three months due to the relatively short life of the erythrocyte.

A few studies (Lowery & DuCette, 1976; Edelstein & Linn, 1987; and White, Carnahan, Nugent, Iwaka & Dodson, 1986) have attempted to determine the relationship of locus of control to the control of diabetes. Lowery & DuCette (1976) found that internal diabetics were more active in seeking information about diabetes than externals but became more passive over time as the disease progressed. Over time, externals were shown to have fewer problems with their diabetes while internals did not show a decrease in the number of problems experienced. Edelstein & Linn (1987) found that externally oriented individuals who had diabetes for almost twelve years had good metabolic control of diabetes as measured by glycosolated hemoglobin, blood glucose, triglyceride and cholesterol levels. White, Carnahan, Nugent, Iwaka & Dodson (1986) studied two groups of adult onset diabetic patients and found that the more internally oriented an individual was, the lower the glycosolated hemoglobin. As time progressed, the patients in the management group which encouraged patient interaction had lower blood sugars than patients in the group

which received advice and education, but there was no difference in the glycosolated hemoglobin values between either group.

In summary, according to Lowery & DuCette (1976), it would seem plausible that internals are more apt to seek information about their disease and attempt to create a situation in which they can exhibit some control. As diabetes progresses, those patients with an internal locus of control may realize that they cannot control a condition inside their bodies affecting all of their organs at every moment of time which may account for their passivity and problems. On the other hand, those patients with an external locus of control may not be concerned with controlling the disease but rather with complying with the doctors orders. Therefore, the goal for diabetes education should be to develop a program balanced with internal-external tendencies to maximize compliant behaviors to the greatest extent possible.

Problem

Does a self directed program have a significant impact on an individual's locus of control and the control of diabetes as measured by glycosolated hemoglobin?

Questions

The following questions were developed to investigate this problem:

- 1) Does the use of the self-directed program result in any change in the health locus of control orientation of diabetic subjects?
- 2) For patients who are in a self-directed program, is their health locus of control related to their control of diabetes as measured by hemoglobin A1C?

Assumptions

In preparing this thesis, the following assumptions were made:

- 1) The sample will be representative of the noninsulin and insulin dependent diabetic population.
- 2) The Multidimensional Health Locus of Control Scales will measure orientation toward health beliefs appropriately.
- 3) Patients will answer questionnaires honestly without feeling any pressure to answer them the way they perceive the researcher would want them to answer.

Limitations / Confounding Variables

The possible limitations and confounding variables of the thesis are as follows:

- 1) Patients may not complete the Multidimensional Health Locus of Control Scale honestly.
- 2) The drop out rate due to patients' inability to obtain time off from work for follow up visits may adversely affect the results.

- 3) Some patients may not understand the concept of health locus of control and may refuse to fill out the questionnaires.
- 4) Health behaviors are complex and the Multidimensional Health Locus of Control Scale alone may not adequately measure the complex concept of compliance.

Operationally Defined Terms

Insulin dependent diabetes mellitus (Type I) - condition of elevated blood sugars due to a deficiency of the pancreas' ability to make insulin (Beigelman & Kumar, 1986, American Diabetes Association, 1985).

Noninsulin dependent diabetes mellitus (Type II) - condition associated with elevated blood sugars and a defect in insulin secretion and action (Beigelman & Kumar, 1986, American Diabetes Association, 1985).

Self Directed Program - teaching program structured toward assisting patients to take the initiative in determining their learning needs, developing goals and implementing ideas (Knowles, 1975). In this study, patients are guided by the health care professionals to develop goals to care for their disease, diabetes.

Internal Locus of Control - the belief that the individual perceives an event is dependent upon his behavior (Rotter, 1966).

External Locus of Control - the belief that an event or condition is dependent upon chance, fate or under the control of powerful others (Rotter, 1966).

Glycohemoglobin - a metabolic indicator of blood glucose control which in effect allows the determination of how much glucose is attached to the hemoglobin molecule. Since the red blood cell grows, matures and dies within 120 days, this indicator can report the average daily blood sugar over the past two to three months (Peterson et al., 1979; Pecoraro, Chin & Porte, 1982).

Blood glucose control - maintaining blood sugars between 80 - 150 mg/dl without signs or symptoms of hypoglycemia. "Good blood glucose" can be reported as one to two standard deviations above the nondiabetics glycohemoglobin (Skyler, 1981).

Review of the Literature

In the past twenty-five years, there have been well over 600 studies published on some aspect of locus of control (Rotter, 1975). This does not include the enormous number of master's thesis and doctoral dissertations that have not been published. It is clear that the interest in this topic can be related to social problems that affect society at every level.

Rotter's Social Learning Theory

The construct, locus of control, developed out of Rotter's (1966, 1975) social learning theory. It has been thought to be the central construct in this theory; however, Rotter (1975) emphatically argues that it is not. Rotter's interest in locus of control developed because of the observation that an increase or decrease in the expectancies after reinforcement appeared to vary depending on the situation as well as the characteristics of the individual being reinforced. In other words, Rotter was interested in a variable that would assist him to develop a prediction of how reinforcements change expectancies. The nature of the reinforcement itself, whether positive or negative, significant past history, sequence and patterning of such reinforcements, and the value attached to the reinforcement are perhaps the most critical determinants of behavior. The construct, locus of control, is defined as follows:

When a reinforcement is perceived by the subject as following some action of his own but not being entirely contingent upon his action, then, in our culture, it is typically perceived as the result of luck, chance, fate as under the control 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 person perceives that the event is contingent upon his own behavior or his own relatively permanent characteristics, we have termed this a belief in internal control (Rotter, 1966, p.1).

There are four characteristics of the social learning theory: behaviors, expectancies, reinforcements, and psychological situations. In its most general form, the formula for behavior is that the "potential for a behavior to occur in any specific psychological situation is a function of the expectancy that the behavior will lead to a particular reinforcement in that situation and the value of that reinforcement" (Rotter, 1975, p. 75).

A hypothesis of social learning theory is that when individuals perceive two situations as similar, their expectancies for a specific type of reinforcement will generalize from one situation to another. This does not indicate that the expectancies will be similar in the two situations, but the changes in the expectancies in one situation will have some small effect in changing the expectancies in the other. Expectancies in each situation are influenced not only by

particular experiences in that situation but also, by experiences in other situations that the individuals recognize as similar.

Although locus of control has been researched from several aspects, this review will deal with its relationship to health behaviors, sick role behaviors and chronic diseases. Research on health locus of control related to smoking, contraception, weight loss, flu shots, cholecystectomy, hysterectomy, chronic hemo-dialysis and hypertension will be reviewed with the primary focus being on health locus of control and the control of diabetes.

Locus of Control and Health Behaviors

Smoking

Straits and Sechrest (1963) studied 125 male college students, fifty-four of whom were smokers. The subjects were given two questionnaires, a personality inventory which included locus of control and a biographical, factual questionnaire. Results of the study indicated that smokers were more "chance oriented" than nonsmokers.

James, Woodruff & Werner (1965) studied 272 female (123 cigarette smokers and 149 nonsmokers) and 185 male undergraduate students (102 smokers and eighty-three nonsmokers). They administered a brief questionnaire regarding the smoking habits and attitudes toward the surgeon general's

report on the effects of smoking one week after the report was issued. Subjects had been given Rotter's Internal-External Scale five weeks prior to the initiation of the study and the results replicated the findings of Strait's and Sechrest's study.

Conversely, Lichtenstein and Keutzer (1967) administered a battery of tests to measure personality and anxiety over a five week period to ninety-five male and 118 female smokers in a smoking program and found there was a small but significant tendency for older smokers to have internal locus of control beliefs.

Contraception

The research on locus of control and contraception has produced interesting results. MacDonald (1970) administered questionnaires to 212 undergraduate students and found that sixty-two percent of the internals reported they utilized some form of birth control in contrast to only thirty-seven percent of the externals stating they utilized birth control.

Bauman & Udry (1972) interviewed 350 married black men and found that eighty-eight percent of internally oriented men practice contraception every time as compared to ten percent of the externally oriented individuals.

On the other hand, Harvey (1976) administered a battery of personality measures, including Rotter's Internal-External Scale, to a random sample of 316 female

undergraduate second and third year students and did not find evidence to support the hypothesis that users of safe contraception would be more internally oriented.

Weight Loss

Studies within the past ten years have found locus of control to be a significant factor in weight loss. Wallston, Wallston, Kaplan & Maides (1976) studied thirty-four overweight women who were students or staff at two small colleges and found that the program that was compatible with the subjects' expectancies was evaluated more positively than the incompatible program; externals lost more weight in the externally oriented program than in the internally oriented program and internals lost more weight in the internally oriented program than in the externally oriented program.

Wineman (1980), in a retrospective investigation studied 116 subjects with regard to locus of control, body image and weight loss in Overeaters Anonymous. Several questionnaires were administered including Rotter's Social Reaction Inventory, and the results indicated in the entire adult onset group that there was a relationship between perception of internal control and a positive body image.

Balch & Ross (1975) studied thirty-four females whose initial weight ranged from 127 pounds to 277 pounds (5 percent - 145 percent overweight) and found that the more

internally oriented individuals were the more likely they were to successfully complete the weight loss program which consisted of nine weekly one hour meetings.

Tobias & MacDonald (1977) studied one hundred obese undergraduate women stratified to one of five experimental groups: 1) weight reduction, 2) self determination, 3) behavioral contact, 4) effort control, and 5) no contact control. They found that individuals stratified to the self determination group (the group that was told that "their obesity resulted from a failure to exert sheer determination or will power") (Tobias & MacDonald, 1977, p. 649) became more internal as evidenced by the decline in the post-test scores of Rotter's (1966) Scale at the tenth week.

Manno & Marston (1972) studied forty-one overweight students and staff from a university setting who were randomly assigned to three groups for an eight week period of time. Rotter's (1966) Scale was administered and the results indicated that in the control group, individuals with an external orientation weighed more in the beginning of the treatment phase and lost less weight at follow up visits.

O'Bryan (1972) administered Rotter's (1966) Internal-External orientation with fifty-four women participating in a TOPS weight reduction program and found that overweight individuals as a group were more externally oriented, less likely

to report weight loss, more likely to blame their weight problem on physiological causes and more likely to admit that their desire to lose weight was due to pressure from others rather than from within. Quite unexpectedly, there were no significant differences between the internals and externals on information seeking, learning, and use of information concerning weight control. In other words, when individuals are particularly motivated to solve a significant problem (such as weight loss) it would seem on the basis of O'Bryan results that there would be no reportable difference in locus of control between individuals who actively pursued information and learning behavior and those who did not.

Flu Shots

Dabbs & Kirscht (1971) sent questionnaires to 510 college students, 259 of whom had taken the flu shots and 251 who did not. The authors found that internal subjects, using motivational terms to measure locus of control, were more likely to take the flu shot than those they designated as external. On the other hand, using expectancy items to measure locus of control, internally oriented individuals were not as likely to have taken the shots. Wallston & Wallston (1978) caution against confusing motivation with locus of control especially since motivation to participate in self care practices can also predict health behavior.

Locus of Control and Sick Role Behaviors

Cholecystectomy

A few studies have investigated the relationship between locus of control and illness. Clum, Scott & Burnside (1979) studied nine males and thirty-nine female patients between the ages of twenty-one and seventy-three years of age one day prior to elective cholecystectomy and five days after surgery. They found that individuals who were internally oriented as determined by the Health Locus of Control Scale and who also possessed a great deal of information about the impending surgery, experienced a great deal of pain as measured by the amount of pain medicine received. It seems as if internals utilize this information to attempt to control the situation and this is accomplished by requesting more drugs to relieve the pain.

Hysterectomy and Cholecystectomy

Johnson, Dabbs & Leventhal (1970) studied forty-four female patients admitted for elective abdominal hysterectomy and eighteen female patients admitted for cholecystectomy from the morning of surgery through the fifth postoperative day. Four questionnaire scales were administered (worry, chronic anxiety, internal-external locus of control scale and patient participation). The results indicated that among

women undergoing abdominal surgery, internally oriented patients received more analgesics than externally oriented patients. The authors also found that the first born internals tended to stay in the hospital longer, which could have been a desirable alternative to the women who thought that going home meant continuing with the usual household chores. The statement, "there was evidence that the belief that one can control one's environment is associated with the ability to influence others so as to achieve one's own ends" (Johnson, Dabbs & Leventhal, 1970, p. 26) holds a great deal of relevance for this study. In addition, the internals' behavior in this case may not be inadequate, but rather compatible with the patient's perception of the correct way to react in a hospitalized situation.

Myocardial Infarct

Winefield (1982) compared fifty-three patients who had recently suffered their first myocardial infarction with fifty-two men of similar age and occupational status who had not suffered a myocardial infarction. Both groups filled out psychological test forms as well as the Multidimensional Health Locus of Control Scale. The results indicated that myocardial infarct patients expressed greater faith in the ability of powerful others to control their health.

Locus of Control and Chronic Disease

Chronic Hemodialysis

In discussing locus of control and chronic illnesses, there are studies which show some type of statistical correlation. Poll and De-Nour (1980) sampled forty patients (thirty men and ten women) on chronic hemodialysis from four dialysis units. Two of the units functioned under an authoritarian mode, telling patients what to do, and the other two units were more democratic, discussing with patients the desired behaviors. The areas of compliance, vocational rehabilitation, acceptance of disease, and Rotter's (1966) Locus of Control were assessed and it was determined that dialysis patients portrayed attitudes and behaviors consistent with external locus of control beliefs. The findings indicated that the external locus of control in dialysis patients was not adaptive in terms of adjustment to a long term disease. Patients with an internal locus of control did much better as far as compliance with diet, vocational rehabilitation and assessment of quality of life. The authors pointed out the fact that the shift from internal to external locus of control had occurred while the patients were still in the chronic uremic pre-dialysis stage, although this cannot be confirmed until a study can be done with pre-dialysis patients. Nonetheless, Poll and De-Nour suggested that individual adjustment toward dialysis did not change over time. The adjustment phase incorporated a certain

amount of regression and the complete regression which occurs with external locus of control did not allow the patient to adjust with regards to compliance, vocational rehabilitation and quality of life.

Hypertension

Thus far there have been two studies that have correlated hypertension with locus of control. Wallston, Wallston, Kaplan & Maides (1976) studied forty-four males and forty-four female college students who completed a booklet on hypertension, health locus of control scale, Rotter's Internal-External Scale and a measure of value they attributed to health. The subjects then read a message about the dangers of hypertension and selected from a list of sixteen pamphlets which ones they would read. The authors found that internally oriented individuals who value health highly sought more information about hypertension than did externally oriented individuals in the study.

Lewis, Morisky & Flynn (1978) administered home or telephone interviews to 318 subjects with hypertension and found that the more support individuals had and the greater the internal orientation, the greater the level of self reported compliance.

Diabetes Mellitus

Lowery & DuCette (1976) selected a cross sectional sample of thirty newly diagnosed diabetics, thirty diabetics diagnosed for three years and thirty diabetics between the ages of twenty-five and sixty-five who were diagnosed with diabetes for six years. They administered Rotter's (1966) Internal-External Scale, Diabetes and Health Information Test and assessed the degree of diabetes control. The authors found that internal diabetics were more active in seeking information about diabetes than externals but became more passive over time as the disease progressed. Over time, externals were shown to have fewer problems with their diabetes while internals did not show a decrease in the number of problems experienced. It may be that the uncontrollable, unpredictable aspects of diabetes leads internals to discover that their usual response is inadequate and therefore no matter what they do, diabetes will always have the advantage. After the three year period, internals began to miss more appointments and neglect their disease whereas the externals exhibited more compliant behaviors.

Edelstein & Linn (1987) studied 120 adult onset diabetic veterans who had diabetes for almost twelve years and who had been on insulin for one year prior to enrollment in the study. The patients were followed every six months for a period of three years and were given Rotter's Scale, a stress

test and a physiological test. Edelstein hypothesized that internally oriented patients would have more feelings of control over events in their lives and that this would lead to better control of diabetes as measured by the glycosolated hemoglobin. The primary findings indicated that externally oriented individuals had better metabolic control of diabetes as measured by glycosolated hemoglobin, blood glucose, triglyceride and cholesterol levels than did internally oriented individuals.

White, Carnahan, Nugent, Iwaka & Dodson (1986) studied a group of forty-one adult onset diabetic patients over a six month period and compared the effect of a group management program and advice-education on health locus of control and the control of diabetes. Initially, patients were seen for one hour sessions at one and two week intervals and later at one month intervals. Patients were asked to perform home blood glucose monitoring, decrease their caloric intake, increase their exercise and to keep in close contact with the doctor to adjust the dose of insulin to maintain euglycemia. Internal Health Locus of Control was determined by Wallston's (1978) Multidimensional Health Locus of Control Scale. White, et al., (1986) found that the more internally oriented an individual was, the lower the glycohemoglobin. As time progressed, the patients in the management group which encouraged patient interaction had lower blood sugars than

patients in the group which received advice and education, but there was no difference in the glycosolated hemoglobin values of either group.

Summary

In summary, the review of the literature has revealed the following information:

- 1) Smokers were more "chance oriented" than nonsmokers (Straits & Sechrest, 1963 and James, Woodruff & Werner 1965) and there is a tendency for older smokers to have internal locus of control beliefs.
- 2) Between two thirds (MacDonald, 1970) and nearly eighty-eight percent (Bauman & Udry, 1972) of internals reported using some form of birth control.
- 3) Individuals with an external orientation lost more weight in an externally oriented program and individuals with an internal orientation lost more weight in an internally oriented program (Wallston, Wallston, Kaplan & Maides (1976). There was a positive relationship between perception of internal control and positive body image (Wineman, 1980). The more internally oriented individuals were, the more likely they were to complete the weight loss program and to lose weight (Balch & Ross, 1975). Overweight individuals as a group were more externally oriented, less likely to report weight loss, more likely to blame their weight problem on physiological causes and more likely to

admit their desire to lose weight was due to pressure from others rather than from within (O'Bryan, 1972).

4) Individuals who were internally oriented and who had information about the impending surgery asked for pain medication more often (Clum, Scott & Burnside, 1979). Among women undergoing abdominal surgery, internally oriented patients received more analgesics than externals (Johnson, Dabbs & Leventhal, 1970). Myocardial infarct patients expressed greater faith in the ability of powerful others to control their health (Winefield, 1982). For the most part, dialysis patients portrayed attitudes and behaviors consistent with external locus of control beliefs (Poll & De-Nour, 1980).

6) Internally oriented individuals who value health highly sought more information about hypertension than externally oriented individuals (Wallston, Wallston, Kaplan and Maides, 1976). The more support that hypertensive patients had, the greater the internal orientation and self-reported compliance (Lewis, Morisky & Flynn, 1978).

7) Internally oriented diabetics were more active in seeking information about diabetes than externally oriented individuals but became more passive over time as the disease progressed. Externals were shown to have fewer problems with their diabetes while internals did not show a decrease in the number of problems experienced (Lowery & DuCette, 1976). Externally

oriented individuals had better metabolic control of diabetes mellitus as measured by metabolic blood tests (Edelstein & Linn, 1987).

Therefore the implications of these findings for diabetes education are to assess patients locus of control, to develop a teaching program to encourage internality and provide external assistance when appropriate; to provide a warm, supportive climate; to encourage self blood glucose monitoring; and to allow patients as much control of the environment as possible to maximize compliant behaviors, thereby hopefully decreasing the microvascular complications of diabetes.

Methodology

Subjects and Sampling

The target population for this study will consist of patients with insulin dependent and noninsulin dependent diabetes hospitalized for intensive diabetes education. The sample will consist of fifteen patients between the ages of fourteen and seventy-five, of all ethnic backgrounds who are enrolled in the eighteen hour diabetes education class in a hospital in South Central Texas. The unit where the diabetes education classes are held is a forty-two bed unit in which patients who have various endocrine disorders are treated. Approximately ten to fifteen patients attend the classes every week. The patients who attend the inpatient teaching classes are patients who are hospitalized for intercurrent illnesses that cannot be managed at home as well as patients who are experiencing difficulty controlling their blood sugars.

A volunteer convenience sample was selected the second day of class. Although it is recognized that convenience sampling may produce subjects who are not typical of the population under study and may produce biased data, it was determined to be the method which would enable the recruitment of patients at a consistent pace.

Informed Consent

Prior to conducting the study, informed consent was presented to each of the potential subjects. The subjects were allowed to ask questions and clarify the protocol and it was stressed that if they did not wish to participate in the study, neither their medical care nor their opportunity to participate in the classes would be jeopardized in any way. All data was to be considered confidential and, subjects were informed that the investigator would be the only person who would know who participated in the study. Subjects were also given the option to withdraw from the study at any time without jeopardizing their relationships with their doctors or nurses. The subjects were told that the proposal had been approved by the Investigational Review Board of the Hospital (see Appendix A) and the Investigational Review Board of Incarnate Word College (exempt status) (see Appendix B).

Prior to the beginning of the study, the investigator provided a verbal description of the study, a review of the informed consent (see Appendix C), a discussion of the methods of data collection (see Demographic Data Sheet in Appendix D) and an explanation of Wallston's Multidimensional Health Locus of Control Scales (see Appendix E). An opportunity for the subjects to ask questions and verbalize concerns was provided before, during and after the study was initiated.

Instrumentation

Multidimensional Health Locus of Control

Scales

Wallston & Wallston (1981) developed the Multidimensional Health Locus of Control Scale which was designed to measure locus of control in health care settings. Their interest in relating locus of control to health care situations began with an observation of classes for newly diagnosed diabetic patients and their families. The medical staff at that time was stressing the importance of the patient's active role in their own care, which was incorporating Rotter's (1966) construct of internality. When Wallston & Wallston tried to convince the staff to structure their entire teaching program on the social learning theory framework, the staff was not interested in the concept. They preferred to evaluate their effectiveness in terms of the patients' knowledge about diabetes and treatment rather than expose themselves and their patients to constructs developed within the field of psychology. While the Health Locus of Control Scale was an improvement in predicting health behaviors, it is important to note that it was still a "generalized expectancy measure" for many health-related behaviors. After utilizing the Health Locus of Control Scale in a few studies, Wallston & Wallston (1981) began to question

their initial decision to treat health locus of control as a unidimensional concept. Wallston, Wallston & Devellis (1978) then went on to develop the Multidimensional Health Locus of Control Scale which attempted to relate the multifaceted beliefs of individuals to their resultant health care behaviors. The Multidimensional Health Locus of Control Scale has a four fold purpose:

- 1) to relate health locus of control beliefs to specific health behaviors in health care settings,
- 2) to use this knowledge to individualize the patient's treatment based on locus of control beliefs,
- 3) to serve as a dependent variable to evaluate treatment programs and,
- 4) to measure the following three distinct dimensions:
 - a. internality,
 - b. chance externality, and
 - c. powerful others externality.

Reliability

Winefield (1982) tested the reliability and validity of the Multidimensional Health Locus of Control Scale by conducting three studies. The first study explored the subscales' reliability by the use of Cronbach's alpha coefficient. Winefield administered the Multidimensional Scale (Form A) to 152 first

year medical and dental students (109 males and forty-three females). The results of these tests were then used in teaching them Behavioral Science. The Cronbach alpha measures of internal consistency were .49 for chance, .58 for powerful others and .70 for internality. While none of these values demonstrates a high degree of consistency, they do provide a means for assessing the subscales relative to one another.

Winefield's (1982) third study discussed information about the test-retest reliability of the Multidimensional Health Locus of Control scores over seven months. Twenty-eight myocardial infarct subjects were interviewed while at home an average of thirty point six weeks following discharge in order to assess their progress towards recovery. Subjects were given form A of the Multidimensional Health Locus of Control Scale at the outset and Form B for the seven month retest. Information was also collected about their current health, symptoms, activities of daily living, and degree of compliance with medical regimens. Test-retest scores on the parallel forms of the test were compared utilizing paired t tests and Pearson correlations. The results indicated that both internality and powerful others appear to be stable over time with powerful others being somewhat higher during the acute illness than afterwards. The subjects' chance subscores failed to show stability over time.

Validity

The scores of the Multidimensional Health Locus of Control forms in the first study were calculated and the following mean subscores were determined: internal - 24.30; chance - 15.83; and powerful others - 15.71. Factor analysis supported the internal structure of the scale in that all of the internal components loaded together into two factors and five of the six powerful others components loaded into a third. Factor analysis did not support the cohesiveness of the chance subscale, as only two of the components loaded to form a chance factor. When these factors were examined in relation to the subscale scores the following results were obtained: 1) the internal scores correlated significantly with both of the internal factors ($r = .84$ and $r = .76$), 2) the powerful others scores correlated significantly with the powerful others factor ($r = .76$) and 3) the chance scores correlate significantly with the chance factor ($r = .64$) (all $p < .01$). These results support the construct validity of the scale in that the factor scores correlate well with the raw subscale scores. The results of this study should be reviewed cautiously as the sample population was quite different from the general population with regard to age, educational achievements and relatively few chronic medical complaints.

To determine if the Multidimensional Health Locus of Control scale measures stable as opposed to temporary psychological characteristics, Winefield (1982) began her second study by comparing acutely ill patients to a group of healthy subjects with the expectation that the distribution of scores for acutely ill people would be comparable to that of healthy people if the scales, in fact, measure stable traits. Winefield compared fifty-three patients who had recently suffered their first myocardial infarction with fifty-two men of similar age and occupational status who had not suffered a myocardial infarction. Both the control group and the experimental group filled out psychological test forms and the Multidimensional Health Locus of Control Scale. It was determined that the powerful others score increased with age and lower social status. Although the myocardial subjects in this study were older and of lower average social status in comparison to the control, the results indicated that myocardial infarct patients expressed significantly greater faith in the ability of health care professionals to control their health over and above that which was attributable to age and social status. Thus, acute illness was also determined to have an impact on the powerful others score. The internal and chance scales were not found to be different between the groups.

Winefield's (1982) third study also discussed the relationship between the Multidimensional Health Locus of Control score and compliance with medical instructions after a myocardial infarction. The correlations between the Multidimensional Health Locus of Control subscores, compliance with medical advice and recovery measures (i.e., exercising) failed to reach significance at the .05 level. Predictive validity was not determined in this data for the Multidimensional Health Locus of Control Scale.

In conclusion, Winefield's (1982) summary of each subscale is as follows:

- 1) internality scale - internal consistency is .70, responses are stable over time and not affected by age, social status, or acute illness. Additionally, there is no justifiable evidence that a belief in self control of health is a predictor of meaningful behavior,
- 2) chance scale - internal consistency is low (.49) and responses are not stable over time,
- 3) powerful others scale - subject to age, social status, and is elevated during acute illnesses. There was no substantial evidence that expressing beliefs about the ability of powerful others to control an individuals' health was associated with complying with medical advice.

The validity question remains far from definitive because there is no concrete proof that the scales measure an

individual's belief about locus of control of health. When health locus of control is perceived of as a dependent variable (i.e., test of efficacy of interventions in changing beliefs), the evidence for the validity appear greater than when the construct is utilized as a predictor of behavior (Wallston & Wallston, 1981). The Multidimensional Health Locus of Control Scale is perhaps one of the best scales to use thus far in predicting health related behaviors however, it is unlikely that health locus of control alone will predict the variability and complexity of health behaviors.

The findings of these studies will aid the researcher in interpretation of the data and drawing inferences. In particular, care should be taken in the use of the chance subscale score as a predictor due to its poor reliability. The chance score will be used predominantly as a dependent measure. If the ages of the subjects are vastly different, care will be taken in comparing the powerful others scales. Age adjusted scores may be computed to overcome this bias. The associations with the glycosolated hemoglobin as a measure of behavior will be limited to the internal subscale score due to its superior reliability.

Hemoglobin A1C

Diabetes control will be assessed before the beginning of class and two months after classes with the hemoglobin A1C blood test. The hemoglobin A1C is measured by

the the High Performance Liquid Chromatography method manufactured by Helena Laboratories in Beaumont Texas.

Design for Data Collection

Data for this study was collected from patients hospitalized for various intercurrent illnesses who were presently attending the eighteen hour diabetes education classes as part of their prescribed treatment. Subjects were entered into the study if they had documented noninsulin or insulin dependent diabetes and if they signed the informed consent. As part of the research protocol, subjects were interviewed and asked if they would be willing to participate in the study on the second day of class. The referring doctor was notified of the willingness of their patient to enter above said procedures.

After the informed consent was obtained, the subjects were asked to fill out the demographic data sheet and complete Wallston & Wallston's Multidimensional Health Locus of Control Scale (Part A and B) (see Appendix E). Subjects were asked to rank their level of agreement with each statement on a six point Likert-type scale ranging from strongly disagree to strongly agree. Upon completion of the scale, the researcher collected the data and notified the patients that they will be seen again in two months.

The diabetes classes covered an overview of several topics including the pathophysiology of diabetes, nutritional counseling, stress management, performance of exercise and a discussion of oral hypoglycemic agents and insulin (see Appendix G). The classes began on Mondays and finished on Thursdays and usually covered eighteen hours of material including group discussions and one to one discussions as needed.

The hemoglobin A1C was drawn before the classes and was repeated again after two months. Wallston & Wallston's Multidimensional Health Locus of Control Scale was also given again at the end of the two month period. Diabetes control was assessed before the study began and within two months by the investigator encompassing the following:

- 1) A review of the patient's home glucose monitoring data. As a part of their routine care, patients will need to monitor blood sugars four times a day (before meals and bed) if they are on insulin or twice daily (before breakfast and two hours after the largest meal) if they are controlled with oral hypoglycemic agents or diet.

- 2) Discussion of any problems with diabetes management such as concurrent illnesses or problems at home or work.

Confounding Variables

The independent variable, self directed program, could be confounded by the following:

- 1) The patients' ability to understand what is being taught will have a bearing on how self directed the program will be. For example, some patients may not understand how to adjust insulin and the program may have to become directed for the time being or until the educator chooses to move on and deal with the person on a one-to-one basis.
- 2) Although the program is self directed in nature, there are areas of teaching that are definitely pedagogical in nature. For example, patients are taught to adjust medication by one to two units of insulin a day every three to four days whereas if patients' were exercising self-directedness, they would adjust more than two units and more frequently depending on the pattern of the blood sugars.
- 3) Some patients will not have the background knowledge of diabetes management and therefore the self-directed program may not be as self-directed as for others.
- 4) Finally, the program may not be taught by the same nurse educator everyday depending on schedule changes and the necessity of the nurses to work elsewhere in the hospital.

Data Analysis

In analyzing the data statistically, the following two questions will be examined:

Question 1: Does the use of the self-directed program result in any change in the health locus of control orientation of diabetic subjects?

In order to answer this question, repeated measures analysis of variance will be used to determine whether a difference exists in the degree of internality between both Time 0 and Time 1. The degree of internality will be measured by the Internal Health Locus of Control score.

In addition, each subject will be categorized as being principally internal, principally chance external, or principally powerful others external based on the greatest standardized z-score among the three scales. Chi-square tests will be used to determine whether a change occurs in the proportion of subjects found in these categories across time 0 and time 1. If changes are observed, the data will be examined for trends to detect which orientation changes are most likely.

Discriminant analysis will be used in the attempt to determine which demographic and/or health variables are useful in predicting a patient's health locus of control. The three

categories mentioned above will be used as the dependent variable. A separate analysis will be performed at each time in order to determine whether the predictors remain the same across time 0 and time 1.

Question 2: Is the patient's health locus of control related to his or her control of diabetes as measured by hemoglobin A1C?

In answering this question, analysis of variance will be used to determine whether the mean hemoglobin A1C differs among the principally internal, chance external and powerful others external groups at Time 0 in order to ascertain whether a baseline relationship exists between these entities.

If such a relationship is found, product-moment correlations will be performed between hemoglobin A1C and each of the three scales individually to better determine the nature of the association.

The paired t-test will be performed on the hemoglobin A1C's at time 0 and time 1 to determine whether any change has occurred in the mean value over time. Additionally, multiple regression will be performed using the change in the hemoglobin A1C as the dependent variable and each of the three scale scores along with demographics as the

independent variables in order to determine which factors are the best predictors of change in hemoglobin A1C.

Finally, the correlation between the change in hemoglobin A1C and the change in the level of internal orientation will be determined to further describe any association between the effort to improve health locus of control and the success in terms of diabetes management.

Results

Description of the Subjects

Of the fifteen subjects who participated in this study, data from only ten were utilized due to the fact that the final blood test to measure the remaining five subjects' control of diabetes was not available. Of the ten subjects analyzed, the following descriptive information was determined statistically from the demographic data:

Male\Female

- 1) Sixty percent of the subjects were male while forty percent were female.

Age

- 2) The age of the subjects ranged from fourteen years old to fifty-seven years old with a mean age of thirty-five point

seven years.

Education

- 3) Fifty percent of the subjects had a college education, while forty percent and a high school education and ten percent had completed grammar school.

Ethnicity

- 4) Fifty percent of the subjects were anglo and fifty percent of the subjects were Hispanic.

Type of Diabetes

- 5) Fifty percent of the subjects were Type I - Insulin Dependent while fifty percent were Type II - Noninsulin Dependent.

Type of Control

- 6) All of the Type I subjects were controlled on insulin, forty percent of the Type II subjects were controlled on insulin and ten percent were controlled on diet alone.

Reason for Hospitalization

- 7) Eighty percent of the subjects reported that they were hospitalized for diabetes

only, ten percent reported being hospitalized for diabetes, heart and kidney problems and ten percent reported being hospitalized for diabetes and emotional problems.

Duration of Diabetes

- 8) The duration of diabetes ranged from new onset to twenty-five years. Of the ten subjects, eight were adults while two were fourteen years old. Fifty percent of the adults had Type II diabetes, while thirty percent had Type I diabetes. One of the fourteen year olds had been diagnosed with Type I diabetes for two years while the other fourteen year old was newly diagnosed. Of interest, one of the Type II subjects recently had a heart transplant and also had significant renal disease.

Results of Statistical Analysis

In analyzing the data statistically, the following two questions were addressed:

1) Does the use of the self-directed program result in any change in the health locus of control orientation of diabetic subjects?

2) Is the patient's health locus of control related to his or her control of diabetes as measured by hemoglobin A1c?

Before each question is answered, the reliability of the health locus of control scores will be discussed. The two versions (A and B) of Wallston's Multidimensional Health Locus of Control Scale were compared at Time 0 and Time 1 to evaluate the reliability of the measures. Table 1 displays the reliability of the mean of the two forms versus the reliability of a single form. It can be seen that by using the mean of the scores on Form A and Form B, the reliability is improved. As a result of this analysis, the remaining analyses are performed using the mean scores.

Table 1. Reliability Measures of the Multidimensional Health Locus of Control Scales

		reliability based on mean of both scale	reliability for single scale
Time 0	Internal	.843	.729
	Chance	.589	.417
	Powerful Others	.737	.583
Time 1	Internal	.567	.396
	Chance	.940	.888
	Powerful Others	.955	.914

Several of the reliability values are large indicating that the two forms seem to be measuring the same entity. The greatest agreement between forms occurs in the Internal scale at Time 0 whereas the Chance and Powerful Others scales show greater agreement at Time 1. The difference in the magnitudes of the reliability measures may be largely a factor of the small sample.

Question 1

Question 1: Does the use of the self-directed program result in any change in the health locus of control orientation of diabetic subjects?

This question was statistically addressed through z scores, paired t-tests and discriminant analysis. Repeated measures analysis of variance and chi square were not utilized because of the small sample size. The z score measures how many standard deviations a raw score is from the mean. The z-scores were determined for each of the scales (using the means of forms A and B) and each subject was categorized as principally internal, chance or powerful others oriented based on the greatest z-score.

As shown in Table 2, eighty percent of the subjects remained in the same category following the educational intervention. A comparison of the distribution of subjects' orientations at Time 0 versus Time 1 revealed no significant difference. Thus, based on this data the intervention has no impact on the subject's principal health locus of control orientation.

Table 2. Distribution of Principal Orientations at Time 0 and Time 1.

		<u>TIME I</u>		
		Internal	Chance	Powerful Others
T	Internal	2	1	
I	Chance		3	
M	Powerful	1		3
E	Others			
0				

Paired t-tests were utilized to analyze the differences in the three scales over time. The mean scores, as shown in Table 3, were not found to be significantly different. This is further evidence to support the conclusion that the educational intervention has not had an impact on subjects' health locus of control over a period of time. It should be noted, however, that with small samples, the power of the test is low, and a true difference can be missed as a consequence.

Table 3. Comparison of Multidimensional Health Locus of Control Scores Over Time.

Variable	Mean	Diff	SD	t	p
			Diff.		

Int. 0	32.15	2.05	3.77	1.72	.119
Int. 1	30.10				
Chance-0	12.10	-1.40	3.22	-1.37	.203
Chance-1	13.50				
Powerful-0	23.75	-.600	1.87	-1.02	.336
Powerful-1					

Discriminant analysis was utilized to determine which demographic and/or health variables are useful in predicting a subject's health locus of control. The subjects were categorized as low on the internal scale or high based on the median value for the group. Several variables were examined for relationships with the subjects' level of internality, the results of which are displayed in Table 4. No significant differences were found indicating that the data does not point out good demographic predictors of a subject's degree of internality.

Table 4. Examination of Possible Predictors of Level of Internality

Variable	Mean	SD	t	p
AGE				
Low Internal	39.4	16.2	.74	.478
High Internal	39.2	14.3		
DURATION OF ILLNESS				
Low Internal	2.8	4.1	-1.68	.132
High Internal	12.2	11.8		
EDUCATION				
Low Internal	2.20	.837	-.89	.397
High Internal	2.60	.548		
Variable%	Low Int. %	High Int.		p
DIABETES TYPE				
TYPE I	25.0	75.0		.524
TYPE II	66.7	33.3		
ETHNICITY				
ANGLO	60.0	40.0		1.00
HISPANIC	40.0	60.0		

Question 2

Question 2: Is the patient's health locus of control related to his or her control of diabetes as measured by hemoglobin A1C? This question was statistically addressed through analysis of variance, product moment correlations and bivariate correlations. In looking at the relationship of health locus of control to the control of diabetes, analysis of variance was utilized to test the significance of the differences between the means of the hemoglobin A1C of the internal subjects versus the external subjects. Pearson product moment correlation was utilized with the interval data to test that a correlation actually existed. There was no difference between the principally internal subjects and the principally external (chance or powerful others) subjects with regard to hemoglobin A1C at time 0. The decrease in hemoglobin A1C was slightly greater for the internally oriented group though the difference was not significant. This result is shown in Table 5.

Table 5. Comparison of Decrease in Hemoglobin A1C for Internals versus Externals.

Group	Mean Change HbA1C	SD	t	p
Internal	-3.57	2.27	-.66	.532
External	-2.55	2.15		

There was a highly significant decrease in the level of hemoglobin A1C over time for the population as a whole. Table 6 shows the decrease to be nearly three units. This finding seems to indicate that the educational intervention has both a clinically and statistically significant impact on the patients' desire or ability to control the disease. Attempts to isolate variables which would predict the change in hemoglobin A1C were not successful. Table 7 displays the findings, none of which were significant.

Table 6. Change in Hemoglobin A1C over Time for the Entire Sample.

	Mean HgA1C	SD	t	p
Time 0	9.64	2.35	4.11	.003
Time 1	6.76	1.25		

Table 7. Examination of Possible Predictors of Change in Hemoglobin A1C.

Variable	Mean Change	SD	t	p
HgA1C				
<hr/>				
SEX				
Male	-2.03	1.87	1.14	.292
Female	-3.58	2.22		
ETHNICITY				
Anglo	-2.94	2.42	-.08	.940
Hispanic	-2.82	2.01		
DIABETES TYPE				
Type I	-3.87	1.96	-1.32	.230
Type II	-2.10	2.06		

Variable	Correlation with change in HgA1C	p
<hr/>		
AGE	.533	N.S.
EDUCATION	.331	N.S.
DURATION OF ILLNESS	.292	N.S.
<hr/>		

Finally, the bivariate correlations were examined between the change in hemoglobin A1C and the change in the scale scores. Table 8 displays the results. It is interesting to note that the correlation between change in hemoglobin A1C and change in Chance score is negative in sign indicating that the more chance oriented an individual becomes, the smaller the decrease in their hemoglobin A1C. In other words, an increased Chance orientation may indicate less success in terms of disease control. This conclusion is very tenuous, however, because the correlation is not statistically significant.

Table 8. Correlations of Change in Hemoglobin A1C with Change Scale Scores.

Variable	Correlation with Change in HgA1C	p
CHANGE INTERNAL	.325	N.S.
CHANGE CHANCE	-.572	N.S.
CHANGE POWERFUL		
OTHERS	.333	N.S.

Summary

The educational intervention significantly improves the patient's control of disease as measured by the hemoglobin A1C. The patients' health locus of control (based on either the principal orientation or level of internality) is not affected by the educational intervention. Neither the change in hemoglobin A1C nor the level of internality can be predicted with demographic and / or health variables based on this data. Finally, success in control of diabetes in this study is not related to the patients' health locus of control.

Summary and Discussion

In the fall of 1987, this study was conducted to determine if a self directed teaching program had an effect on an individual's locus of control and control of diabetes. Fifteen patients participated in this study while they were initially hospitalized for a diabetes teaching program. The follow-up analysis was performed between five to ten weeks on only ten patients as the laboratory results on the remaining five were not available for the final analysis. Subjects of this study included individuals between the ages of fourteen and fifty-seven years old.

The question relating to the use of the self-directed program and its resultant effect on health locus of control orientation of diabetic patients was analyzed statistically through z scores, paired t-tests and discriminant analysis. The z scores measured how many standard deviations a raw score is from the mean. The z scores were then determined for each of the scales (using the means of forms A and B of Wallstons Multidimensional Health Locus of Control Scale). The paired t-tests were utilized to analyze the differences in the three scales over time. Discriminant analysis was utilized to determine which demographic and / or health variables were useful in predicting a subject's health locus of control.

The second question referring to the relationship of an individual's health locus of control and control of diabetes as measured by the hemoglobin A1C was statistically addressed through analysis of variance, product moment correlations and bivariate correlations.

Analysis of variance was utilized to test the significance of the differences between the means of the hemoglobin A1C of the internal subjects versus the external subjects. Pearson product moment correlation was utilized with the interval data to test that a correlation actually existed between the hemoglobin A1C and locus of control. Finally, the bivariate correlations were examined between the change in hemoglobin A1C and the change in the locus of control scale scores.

Conclusions

It would seem on the basis of the data collected that over a two month period of time, the subjects' health locus of control (based on either the principal orientation or level of internality) is not affected by the educational intervention (self directed teaching program). This conclusion cannot be generalized to the population because of the relatively small sample size and the fact that the sample was a convenience sample rather than a random sample.

In this study, it would seem that the subject's health locus of control was not related to his or her control of diabetes as measured by the hemoglobin A1C. Furthermore, neither the change in hemoglobin A1C nor the level of internality can be predicted with demographic and / or health variables based on the data collected.

Interestingly enough, there was a highly significant decrease in the level of hemoglobin A1C over time (six to eight weeks) for the population as a whole. The decrease in the level of

hemoglobin A1C was found to be at least three units which was significant at the .003 level. It is thought that the sharp decrease in the hemoglobin A1C could be not only due to the educational intervention but also to the fact that the patients knew that they were in a research study. In conclusion, it would seem that the data in this study would indicate that the educational intervention has both a clinically and statistically significant impact on subjects' desire or ability to control diabetes.

Limitations of the Study

The results and conclusions drawn from this study must be considered in light of its limitations. The following are to be considered limitations of the study:

- 1) The sample selected was a convenience sample rather than a randomly selected sample which indicates that the data cannot be generalized to the population at large.

- 2) The sample size was quite small and not representative of the population with Type I and II diabetes.

- 3) The hemoglobin A1C should have been drawn three months after the initial sample was drawn as the test reflects the life span of the red blood cell. In some cases, the hemoglobin A1C was drawn as early as five weeks and as late as eight weeks in order to complete the study. Time in and of itself was one of the greatest limitations of the study. It is recommended that further research using a six or twelve month follow up might produce different results.

Implications of the Study

It is felt that Wallston's instrument to assess individuals' beliefs and attitudes toward health in general may not be adequate in assessing individuals orientation toward diabetes specifically. The instrument was found to be reliable however it cannot be determined whether or not it's validity can be measured due to the fact that there is no proof that the scales measure an individual's true beliefs about health locus of control.

Recommendations for Further Research

The investigator recommends that the following areas be considered for further research:

- 1) The instrument utilized to measure health locus of control should be an instrument that specifically measures attitudes and beliefs of individuals toward diabetes.

- 2) In order to examine whether an individual's beliefs and attitudes change over time toward diabetes, a longitudinal study will need to be done at six, nine, and twelve month follow up.

- 3) In order to obtain more generalizable results, at least fifty patients will need to be enrolled in the study.

In conclusion, there was not any statistical evidence to indicate that an individuals' orientation toward health has a bearing on the control of diabetes, however the implications that could result from a larger scale study could be as follows:

1) Control of diabetes is paramount as far as normalizing the blood sugar to hopefully decrease the individual's chance to develop complications. Therefore, determining whether an individual is internal or external can assist an educator to develop teaching strategies that will nurture the growth of a need to control the disease. However, whether individuals choose to control the disease or whether the individuals allow the health care professional to control the disease for them; the goal still remains to obtain and maintain adequate blood sugar control. As a health care educator, one should consider that perhaps our patients respond to tender loving care more than they respond to the teaching strategies of internality and externality. Thus, utilizing the principles of adult education to determine how individuals learn best can be more indicative in forecasting the control of diabetes.

Hospital

July 24, 1987

Mary Boyle, R.N., CDE
8042 Wurzbach Road #440
San Antonio TX 78229

Dear ~~Mr~~ Ms. Boyle:

This letter is to advise you that the Investigational Research Committee has approved your study including consent form:

The Effect of a Self Directed Program on Locus of Control and Control of Diabetes.

presented to them at their meeting on July 21, 1987.

Quarterly reports must be presented in writing or in person to continue sponsorship and all adverse affects must be presented immediately to the Chairman. Annual approval is given at the first meeting of the new year.

Sincerely,



Steve Westenhofer
Associate Executive Director

SW/acs



APPENDIX B

MEMO

TO: Mary E. Boyle
FROM: Dr. Robert Connelly, Chairperson *RC*
DATE: September 15, 1987
RE: Research Proposal

The Institutional Review Board of Incarnate Word College categorizes your research proposal as EXEMPT.

INCARNATE WORD COLLEGE
Institutional Review Board
Research Questionnaire

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- I. Investigator: Mary E. Boyle, MSN Student
Colleagues: Sara E. Kolb, Thesis Advisor
Lois Soefje and Mona Smiley, Thesis Committee
- II. Division/Department: Nursing
- III. Research Category: A. Exempt: x
B. Expedited _____
C. Full Board _____
- IV. Purpose of Study: To examine the relationship between health locus of control and self-directed education program on compliance among adults with diabetes
Number of subjects 50 controls ---
Does this research involve any of the following:

	Yes	No
Inmates of penal institutions	_____	<u>x</u>
Institutionalized mentally retarded	_____	<u>x</u>
Institutionalized mentally disabled	_____	<u>x</u>
Committed patients	_____	<u>x</u>
Mentally retarded outpatient	_____	<u>x</u>
Mentally disabled outpatient	_____	<u>x</u>
Pregnant women	_____	<u>x</u>
Fetus in utero	_____	<u>x</u>
Viable fetus	_____	<u>x</u>
Nonviable fetus	_____	<u>x</u>
Dead fetus	_____	<u>x</u>
In vitro fertilization	_____	<u>x</u>
Minors (under 18)	_____	<u>x</u>

For each "Yes" answer above, state what precautions you will use to obtain voluntary consent.

Duration of study 4 months

- V. How is information obtained? (Include instruments used)

(See attached proposal)

Where is information obtained?

(See attached proposal)

- VI. Confidentiality - identifiers used (for subjects)

(See attached proposal)

- VII. Benefit of research:

Source of funding self

- VIII. Possible risk to subjects: None

IF CHANGE IN RESEARCH OCCURS THE BOARD MUST BE NOTIFIED BEFORE RESEARCH IS CONTINUED.

Purpose: The purpose of this research study is to determine if the diabetes education classes will have an effect on your beliefs about health and how well your diabetes is controlled. Past research has shown that there is a direct relationship between an individual's beliefs about diabetes and the control of diabetes.

Patient Population: In order to participate in this study you must:

- 1) between the ages of fifteen and ninety years of age,
- 2) have insulin or noninsulin dependent diabetes,
- 3) be on insulin, pills or diet therapy,
- 4) have attended the diabetes education classes on 6 West.

Procedure: This study will last approximately three months and will involve fifty patients. You will be asked to complete a questionnaire to determine your beliefs, attitudes and feelings about health and health care professionals. The questionnaire will need to be completed again at the end of the week long class as well as three months after the class. A blood test to measure your average blood sugar will be drawn before the classes begin and again at three months as part of your routine care with your physician.

Benefits: You will be providing important data for health care professionals to learn from and to utilize in the care of patients with diabetes.

Confidentiality: By consenting to participate in this study you are allowing the nurse and her assistants to review your medical records for the purpose of obtaining information regarding your personal care. Your nurse and her assistants will consider your records confidential as your records will not be identified as pertaining to you without your permission.

Voluntary participation: Your participation in this study is voluntary and you may withdraw your consent to participate at any time without any prejudice or compromise to your medical care.

Patient Consent: I have had sufficient time to consider the above information and I understand the purpose of the study. If I have any further questions, I can contact Mary Boyle RN at the Diabetes and Glandular Disease Research Clinic at 8042 Wurzbach #420, 512-692-1150 or 512-690-8612.

Signature: _____ Date _____

Witness: _____ Date _____

Principal Investigator: Mary Boyle RN CDE

Data Sheet

Name: _____ ID# _____ (1-50)
Address: _____ Phone: home _____ work _____
Age: _____ Sex _____
Type of diabetes: insulin dependent (Type I) _____
noninsulin dependent (Type II) _____
Education: Grammar _____ High School _____ College _____
Graduate School _____
Ethnicity: Anglo _____ Hispanic _____ Other _____
Duration of Diabetes: _____ years
Type of Control: Insulin _____ Pills _____ Diet _____
Reason for Hospitalization: Diabetes only _____
Infection _____
Broken bones _____
Heart problems _____
Kidney problems _____
Liver problems _____
Mental problems _____

The following is to be filled out by the researcher

Time 0 Data

Date _____ (MM/DD/YY)
IHLC _____
CHLC _____
PHLC _____
HgA1C _____
Educator(s) _____

Time 1 Data

Date _____
IHLC _____
CHLC _____
PHLC _____
Educator(s) _____

This is a questionnaire designed 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 we would like you to circle the number that represents the extent to which you disagree or agree with the statement. The more strongly you agree with a statement, then the higher will be the number you circle. The more strongly you disagree with a statement, then the lower will be the number you circle. Please make sure that you answer every item and that you circle only one number per item. 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 one item. As much as you can, try to respond to each item independently. When making your choice, do not be influenced by your previous choices. It is important that you respond according to your actual beliefs and not according to how you feel you should believe or how you think we want you to believe.

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
If I get sick, it is my own behavior which determines how soon I get well again.	1	2	3	4	5	6
No matter what I do, if I am going to get sick, I will get sick.	1	2	3	4	5	6
Maintaining regular contact with my physician is the best way for me to avoid illness.	1	2	3	4	5	6
Most things that affect my health happen to me by accident.	1	2	3	4	5	6
Whenever I don't feel well, I should consult a medically trained professional.	1	2	3	4	5	6
I am in control of my health.	1	2	3	4	5	6
My family has a lot to do with my becoming sick or staying healthy.	1	2	3	4	5	6
When I get sick, I am to blame.	1	2	3	4	5	6
Luck plays a big part in determining how soon I will recover from an illness.	1	2	3	4	5	6
Health professionals control my health.	1	2	3	4	5	6
My good health is largely a matter of good fortune.	1	2	3	4	5	6
The main thing which affects my health is what I myself do.	1	2	3	4	5	6
If I take care of myself, I can avoid illness.	1	2	3	4	5	6
When I recover from an illness, it's usually because other people (for example, doctors, nurses, family, friends) have been taking good care of me.	1	2	3	4	5	6
No matter what I do, I'm likely to get sick.	1	2	3	4	5	6
It's meant to be, I will stay healthy.	1	2	3	4	5	6
I take the right actions, I can stay healthy.	1	2	3	4	5	6
Regarding my health, I can only do what my doctor tells me to do.	1	2	3	4	5	6

This is a questionnaire designed 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 we would like you to circle the number that represents the extent to which you disagree or agree with the statement. The more strongly you agree with a statement, then the higher will be the number you circle. The more strongly you disagree with a statement, then the lower will be the number you circle. Please make sure that you answer every item and that you circle only one number per item. 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 one item. As much as you can, try to respond to each item independently. When making your choice, do not be influenced by your previous choices. It is important that you respond according to your actual beliefs and not according to how you feel you should believe or how you think we want you to believe.

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
If I become sick, I have the power to make myself well again.	1	2	3	4	5	6
Often I feel that no matter what I do, if I am going to get sick, I will get sick.	1	2	3	4	5	6
If I see an excellent doctor regularly, I am less likely to have health problems.	1	2	3	4	5	6
It seems that my health is greatly influenced by accidental happenings.	1	2	3	4	5	6
I can only maintain my health by consulting health professionals.	1	2	3	4	5	6
I am directly responsible for my health.	1	2	3	4	5	6
Other people play a big part in whether I stay healthy or become sick.	1	2	3	4	5	6
Whatever goes wrong with my health is my own fault.	1	2	3	4	5	6
When I am sick, I just have to let nature run its course.	1	2	3	4	5	6
Health professionals keep me healthy.	1	2	3	4	5	6
When I stay healthy, I'm just plain lucky.	1	2	3	4	5	6
My physical well-being depends on how well I take care of myself.	1	2	3	4	5	6
When I feel ill, I know it is because I have not been taking care of myself properly.	1	2	3	4	5	6
The type of care I receive from other people is what is responsible for how well I recover from an illness.	1	2	3	4	5	6
Even when I take care of myself, it's easy to get sick.	1	2	3	4	5	6
When I become ill, it's a matter of fate.	1	2	3	4	5	6
I can pretty much stay healthy by taking good care of myself.	1	2	3	4	5	6
Following doctor's orders to the letter is the best way for me to stay healthy.	1	2	3	4	5	6

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APPENDIX F

To:
From: Kenneth A. Wallston, Ph.D. *KAW*

Thank you for your interest in the Health Locus of Control Scales. Please excuse this form response, but I have so many inquiries requiring similar replies that I have found this to be an efficient means of disseminating information.

You have my permission to utilize Form A or B of the MHLC scales in any health related research you are doing. My only request is that you keep me informed of any results you obtain using the scales. In that way I hope to continue to serve as a clearinghouse for information about the scales.

I recommend using the more recently developed Multidimensional Health Locus of Control Scales (Health Education Monographs, 6, Spring, 1978, pp. 160-170) over the earlier, unidimensional HLC Scale (Journal of Consulting and Clinical Psychology, 1976, 44, 580-585), since the newer measures are psychometrically superior and potentially more useful.

We are currently in the process of developing Form C of the MHLC scales, an instrument which can easily be made specific to any existing medically-related condition which your subjects might have (e.g., diabetes, cancer, high blood pressure, migraine headaches, arthritis, chemical dependencies, etc.) It is much too early to make Form C generally available to the public, but we are looking for a few investigators who might want to help us establish the reliability and validity of this new instrument. If you think your study can help in this regard, please contact me with details.

If you wish to be added to our mailing list or want additional material, please complete the enclosed interest questionnaire and we will be happy to send it to you. I hope to periodically send updated information related to the use of these scales as it becomes available.

If you have more specific questions, don't hesitate to contact me. Please remember to send me information on any use you make of these scales. I have included a usage questionnaire to facilitate your doing so. I look forward to hearing from you.

DIABETES EDUCATION CLASS SCHEDULE

APPENDIX G

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MONDAY	10:00 AM	SUBJECT: PHYSIOLOGY OF DIABETES What is diabetes? Causes, signs, symptoms and treatment. Current research.
	2:00 PM	NUTRITION CLASS 1 Diet - its effects on diabetes and principles of the exchange list. Dietary control is the key to diabetes.
	7:00 PM	SUBJECT: HOME METHODS OF MONITORING Urine testing - how, when and why. Home blood glucose monitoring.
TUESDAY	10:00 AM	SUBJECT: INSULIN Durations and actions of the different insulins. Drawing up, mixing and injection techniques.
	1:30 PM	SUBJECT: EXERCISE AND DIABETES Importance and benefits of exercise as it applies to the diabetic. Orientation to the exercise equipment.
	7:00 PM	INSULIN ADJUSTMENT - PART 1 A Doctors order is required for patient's attendance. Insulin class is a prerequisite.
WEDNESDAY	10:00 AM	INSULIN ADJUSTMENT - PART 2 Attendance to Insulin Adjustment - part 1 is a prerequisite - along with a Doctors order.
	12:30 PM	NUTRITION 2 - INDEPENDENT LEARNING Selecting and measuring your lunch. Nutrition 1 is a prerequisite.
	3:00 PM	SUBJECT: PHARMACY LECTURE Oral hypoglycemics and the effect of over-the-counter drugs.
	7:00 PM	SUBJECT: COMPLICATIONS OF DIABETES Acute hypo and hyperglycemia: signs and symptoms, causes and treatments. Long-term complications.
THURSDAY	10:00 AM	SUBJECT: LIVING WITH DIABETES The effects of smoking and alcohol on diabetes. Foot care, sick day rules, vacation and travel.
	2:30 PM	NUTRITION CLASS 3 Applying the exchange list. Eating out at restaurants, reading labels and snack ideas.
	7:00 PM	SUBJECT: STRESS MANAGEMENT Techniques and strategies for coping with stress. Effects of stress on diabetes.

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VITA

Mary Elizabeth Boyle was born in Raton, New Mexico on February 13, 1959, the daughter of Thomas Jerome Boyle and Elizabeth Ann Boyle. After completing her work at Raton High School, Raton, New Mexico, in 1977, she entered Incarnate Word College in San Antonio, Texas. During the summer of 1978, she attended Trinidad State Junior College, Trinidad, Colorado. She received the degree of Bachelor of Science in Nursing - Magna Cum Laude - from Incarnate Word College in May, 1981. She was employed by Santa Rosa Children's Hospital from June of 1981 until December of 1983. From January of 1984 to the present, she has been employed by the Diabetes and Glandular Disease Research Center, San Antonio, Texas. In August, 1986, she entered the graduate program in nursing at Incarnate Word College.

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