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A Comparison of Self-Esteem and Health Locus of Control in Adolescents with Insulin Dependent Diabetes Mellitus

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Abstract

A COMPARISON OF SELF-ESTEEM AND HEALTH LOCUS OF CONTROL IN ADOLESCENTS WITH INSULIN DEPENDENT DIABETES MELLITUS

by Janice Mace

This study was a descriptive survey establishing a baseline level of self-esteem and health locus of control in insulin dependent diabetes mellitus (IDDM) adolescents. The purpose of the research was to study and describe health behaviors of IDDM adolescents in regard to self-concept and health locus of control. These behaviors are believed to have life-long ramifications on the IDDM adolescent's health status.

The sample consisted of 91 IDDM adolescents, 34 male and 57 female, in a nonrandom convenience cluster attending a 10-day summer camp.

Null hypothesis one was: Insulin dependent diabetes mellitus would make no difference at the .05 level of significance on the self-esteem of the 13- to 16-year-old adolescent when compared to published normal levels of 5,024 adolescents (Rosenberg, 1972). The Rosenberg Self-Esteem Scale (RSE) was used and the method of statistical analysis was descriptive and inferential. Analysis did not show a significant difference between the sample and Rosenberg's (1972) published norms; therefore, null hypothesis one was retained.

Chi square statistics were used with established levels of seven other psychosocial variables and the high, medium and low levels of self-esteem. Low self-esteem was significantly ($p=.005$) associated with poor general diabetic control in males.

Null hypothesis two stated that there would be no difference at the .05 level of significance in the internal or external locus of control

of the 13- to 16-year-old IDDM adolescent with high, medium or low self-esteem. The Multidimension Health Locus of Control (MHLC) Questionnaire was administered to the sample (Wallston; Wallston, 1979). Three dimensions of health locus of control were used: (1) internality, (2) externality which is powerful others, and (3) chance.

Descriptive and inferential statistics were utilized and Chi square analysis used between the three MHLC scales and high, medium and low levels of self-esteem. No statistical significance was found in their relationships. Therefore, null hypothesis two was retained. The median test was employed to establish health locus of control scale norm levels for IDDM adolescents. The sample's levels with the exception of the powerful others scale (expected to rise with chronic disease) was approximately the same as Wallston and Wallston's (1981) 1,194 college students' levels.

Chi square statistics were used with levels of the seven psychosocial variables compared with the internal, powerful others, and chance scales of the MHLC. There was significance ($p=.02$) shown in the number of internal males who were in good general diabetic control. There was a significant trend toward internality ($p=.07$) in females who managed their diabetic regimen independent of their parents. Lastly there was a significant trend ($p=.06$) of external males and females highly placed on the chance scale whose diabetic control (glycosuria) improved during their 10 days at camp.

Future research directions would include implementation of programs to raise self-esteem of IDDM adolescents and an evaluation of their effect on diabetic control. Because this study suggested that for IDDM

adolescents internal control was markedly influenced by external factors, future investigators using locus of control for behavioral compliance need to become more aware of "actual" control, preferences for control, and how their expectancies for control interface with the reality of each client's environment.

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by

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A Thesis in Partial Fulfillment

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The persons whose signatures appear below certify that they have read this thesis and that in their opinion it is adequate in scope and quality as a thesis for the degree Master of Science.

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Chapter 1

INTRODUCTION

Insulin dependent diabetes mellitus (IDDM) is the most common endocrine disorder of childhood. A significant number of adolescents in the United States have diabetes mellitus and must have daily injections of insulin for survival (Johnson, 1978, p. 95; Drash, 1971, p. 924).

It has been documented that adherence to the diabetic regimen and good diabetic control (normoglycemia) minimize or prevent the vascular complications of juvenile diabetes (Cahill; Etzwiler; Freinkel; Kilo, 1976; Williamson, 1980, p. 400; Pickup; Keen; White; Parsons; Alberti, 1979). Therefore, the goal of this research was to study and describe health behaviors of IDDM teenagers in regard to self-concept and health locus of control as these health behaviors are believed to have life-long effects on IDDM adolescents' health status (Knowles, 1981, p. 217; Swift, Seidman; Stein, 1967, p. 555; Wallston; Wallston, 1978, p. 113; Bruhn, 1977, p. 95).

Background of Problem

The physiology, health care and medical management of insulin dependent juvenile diabetes (IDJD) is well represented in scientific literature. In recent years there has been evidence of an increasing interest in the psychological aspects of diabetes mellitus. Most of the psychologically oriented literature written concerns five different

issues: (1) the role of psychological factors in diabetes onset; (2) the influence of environment on the course of the disease; (3) the psychological response and adjustment of the individual to himself and to his disease; (4) psychiatric sequelae of the disease process; and (5) the response and adjustment of the diabetic child's family (Hauser; Pollets; Turner; Jacobson; Powers; Noam, 1979, p. 465). This nursing research concerns the third issue, which is the impact IDDM has on normal developmental progression, self-esteem, the health internality or externality of the IDDM adolescent, and his psychosocial adaptation to a chronic disease. It was hoped that answers in this area would facilitate nursing interventions designed to guide the adolescent toward diabetic compliance or wellness behaviors.

The rationale behind studying adolescence as a separate period is based on knowledge of the profound biological and psychological changes that occur during this time span. Adolescence is a special developmental period when physical and emotional maturity is obtained; it is the transition from childhood to adulthood. These changes are appreciably different from any other period in the life span (Erikson, 1968; Powell, 1971, p. 12).

Incidence data suggest that the number of IDDM children in poor control (hyperglycemia/ketoacidosis) rises during adolescence, then recedes. There appears to be a substantial amount of psychological and psychosocial adjustment required between the ages of 12 and 16 which affects the course of the disease (Fallstrom, 1974, p. 57; Ludvigsson, 1977, p. 435).

Objectives

Several objectives were named in this research study:

1. A baseline of self-esteem levels for the IDDM adolescent between the ages of 13 and 16 was to be established.

2. A median level of health internality and/or externality of the IDDM adolescent was to be established.

3. The final objective was to determine if there was a relationship between self-esteem and health locus of control in the IDDM adolescent.

Rationale and Theoretical Framework

Using Erikson's model, the stages of human development are characterized as progressive and dependent upon each other, predetermined by the growing child's readiness to be driven toward, become aware of, and interact with a widening social radius. During adolescence the task is to reach autonomy or be motivated toward adult identification with the assumption that certain developmental tasks have been completed at the appropriate stages prior to adolescence (Erikson, 1963).

It would seem reasonable to assume that adolescence is a particularly difficult developmental stage for the young person with IDDM. Normal adolescent concerns as dependence and independence, body image, interpersonal family and peer relationships, school adjustments and wellness adaptation can be inhibited or challenged by the nature of the diabetic regimen (Sullivan, 1979, p. 127). Moreover, diabetes mellitus

appears to challenge the developmental progression of adolescence in multiple ways. Society values independence, self-sufficiency and the ability to eventually establish one's own nuclear family. The IDDM adolescent may perceive himself as incapable of achieving some or all of these goals because of the nature of his chronic illness.

Peer approval is very important in adolescence. If the IDDM adolescent "hides" his diabetes from his friends in fear of rejection, or in alienation (Bronfenbrenner, 1979, p. 231) he may withdraw from social situations and from the peer support and understanding that is essential to building a platform of wellness behaviors. A negative aspect of IDDM is the adolescent using his illness to manipulate others for certain psychological advantages such as sympathy or attention getting, an outlet for family stress, or to be exempted from activities or responsibilities that are necessary for maturation (Bruhn, 1977, pp. 94, 95; Minuchin; Rosman; Baker, 1978).

The beginnings of the adolescent's self-esteem are in his nuclear family. His earliest self-acceptance is greatly influenced by his parents' accepting behaviors (Bruhn, 1977, p. 94). Margaret Mead (1942) has suggested that one of the characteristics of American middle-class child-rearing practices is the pattern of "conditional love." What this observation suggests is that America's middle-class children may be characterized by conditional or unconditional self-acceptance that is dependent on their objective performance rather than the particular potentialities of each child. Kohlberg's studies have shown that children with high self-esteem had parents who were more likely to provide defined standards and set limits on the child's behavior. However,

high self-esteem was especially evident if in addition the child's views were sought, opinions respected, and freedom given that enabled the child to be a participant and gain confidence from assertion of his views (Kohlberg, 1966, p. 172).

High self-esteem implies self-acceptance and expresses the feeling that one is "good enough." He is a person of worth, not superior but, on the contrary, recognizes his limitations and expects to grow and improve. Low self-esteem implies self-rejection, self-contempt, alienation, and self-dissatisfaction. The individual lacking in respect wishes that what he perceives his "self-imagery" to be, was otherwise (Rosenberg, 1972, p. 31).

When the adolescent learns that he has an incurable disease his self-esteem can be affected (Bruhn, 1977, p. 93). There are adjustments and adaptations that must be made and the unpredictable nature of diabetes mellitus can make these adjustments all the more difficult. If it is true that how the adolescent views himself or his level of self-esteem, will affect his wellness behaviors, then one of the key issues of learning wellness behavior and diabetic control in IDDM adolescents is a positive feeling about one's self physically, psychologically, socially, and philosophically (Bruhn, 1977, p. 251). The nature of IDDM is such that if the behaviors necessary to maintain diabetic control are rejected this may be life threatening and can result in life-long complications. An IDDM adolescent has the control of his disease and his life in his hands (Bandy, 1971; Laron, 1980, p. 341).

Locus of control as a factor of diabetic control is just

beginning to be researched and evaluated. An internal person differs from an external person to the extent that he engages in cognitive activity concerning information gathering, his independence, and to the extent that he will allow himself to be influenced by others (Lowery; DeCutte, 1976, p. 358; Wallston; Wallston, 1978, p. 160). An IDDM adolescent who is internal would seek and use information about diabetes, because he believes: (1) that the information is of value, and (2) that this information, when assimilated, can eventually lead to diabetic control, a reinforcement of his wellness behavior (Lowery; DeCutte, 1976, p. 361).

An external adolescent will follow a different course. He will not actively seek information although his knowledge of the disease will most likely gain with time. It is not that he is avoiding information, but rather he is following an "easier" course of compliance with authority. It has been hypothesized that he may even have a more adaptive set of responses than those of the internal adolescent (Lowery; DeCutte, 1976).

In summary it can be said that adolescence is a critical period in an individual's developmental progression. If it is true that insulin-dependent diabetes mellitus has a profound effect on the developmental tasks of this period, there may be a difference between both self-esteem levels and health locus of control in the IDDM adolescent and the nondiabetic adolescent. Since high self-esteem and internal locus of control have been positively correlated in nondiabetic adults (Phares, 1976), it is important to study whether this relationship exists in IDDM adolescents. In this study high self-esteem and an

internalized locus of control were postulated as being related to diabetic adherence or wellness behaviors (Wallston; Wallston, 1978; Bruhn, 1977, p. 93).

Learning wellness behaviors, however, is more than mere adaptive compliance. Wellness behaviors must include development of competence, that is, the social ability to master one's self and have satisfaction in one's life situation (Bruhn; Cordova, 1977, p. 248). Competence for the IDDM adolescent would include having adequate self-esteem so that he could be self-directed, self-controlled, and actively change or adapt to his life situation. The criteria for determining satisfaction should be set by the adolescent, meeting the necessary thresholds for wellness to be completed along the developmental continuum.

The Research Problem

The research problem was to compare self-esteem levels of IDDM adolescents with nondiabetic adolescents, and to determine the relationship between self-esteem and health locus of control levels.

Statement of Hypotheses

The null hypotheses for this study were:

1. Insulin-dependent diabetes mellitus will make no difference at the .05 level of significance on the self-esteem of the 13- to 16-year-old adolescent when compared to published normal levels (Rosenberg, 1972).

2. There will be no difference at the .05 level of significance

in the internal or external health locus of control of 13- to 16-year-old IDDM adolescent with high, medium or low self-esteem.

Definition of Terms

The definitions of terms used in this study appear below.

Adolescence

Adolescents 13 to 16 years old with IDDM of more than one year's duration.

Insulin-Dependent Diabetes Mellitus

Insulin-dependent diabetes mellitus (IDDM) is a disorder of energy metabolism which results from an absolute or functional deficiency of insulin. Insulin deficiency leads to impariment of glucose transport, to a decrease in storage and synthesis in lipids, and to a decrease in the ability to synthesize proteins. These biochemical alterations lead to specific acute and chronic clinical features.

Insulin-dependent juvenile diabetes denotes onset from birth to 17 years of age, with the rate of occurrence of new cases highest among two groups, the five- and six-year-olds, and the pubescent, or 11- to 13-year-old children (Gorwitz; Howen; Thompson, 1975).

Health Locus of Control

This focuses on measurement of internal or external locus of control and the relationship of this individual difference to health related behaviors. Internal control refers to the perception that positive or negative health events are contingent or reinforced by

one's behavior. External control is a perception of positive or negative events as being controlled by forces outside of one and therefore occur independently of one's activities and are beyond personal control (Wallston; Wallston, 1978).

Self-Esteem

A positive or negative opinion of oneself. High self-esteem implies self-acceptance, self-respect, self-value, and a perception of worth in an individual. Low self-esteem implies self-rejection, self-dissatisfaction, and a lack of respect for oneself (Rosenberg, 1972).

Organization of the Remainder of the Study

Chapter 1 contains the background of the research problem, objectives, the theoretical framework, the hypotheses and a definition of terms. A review of the literature and related studies is presented in Chapter 2. The third chapter is concerned with research methods and data collection procedures which were used. The analysis of the data and the statistical analysis is included in Chapter 4, followed by conclusions and recommendations for effective nursing intervention in Chapter 5.

Chapter 2

REVIEW OF LITERATURE

This chapter reviews the literature in the areas of self-esteem, locus of control and related research on psychosocial factors in insulin-dependent juvenile diabetes (IDJD) that pertain to adolescence.

Self-Esteem

The self-esteem dimension is an important one, and has only recently been examined in systematic, empirical research (Coopersmith, 1959; Rosenberg, 1972).

Sullivan's investigation (1978) was designed to examine self-esteem and depression in insulin dependent adolescent females. One hundred non-diabetic females, ages 12 to 16 ($\bar{x}$ age = 13.7) and 105 diabetic females ages 12 to 16 ($\bar{x}$ age = 13.8) were administered the Rosenberg Self-Esteem Scale and The Beck Depression Inventory (BDI). The IDDM adolescents of whom 45 percent were Joslin Clinic outpatients, were surveyed on the first day of three separate summer camp sessions. It was hypothesized that the IDDM group would show lowered self-esteem. The result of both t-tests and Chi square analysis indicated no significant differences between diabetic and non-diabetic groups in the area of self-esteem. When high self-esteem scores were excluded with only moderate and low self-esteem scores examined, the diabetic group showed more lowered scores than the non-diabetic group. The low self-esteem groups also showed significantly more depression (BDI). In terms of actual

scores, Rosenberg (1972) found that 13 percent of the 5,072 adolescents he studied had very low self-esteem. In Sullivan's study, 14 percent of the non-diabetic and 21 percent of the diabetic adolescents had very low self-esteem scores. However, the overall differences of low, moderate and high self-esteem scores were not statistically significant. Hauser and Others (1979), using Coopersmith's self-esteem inventory (1959) and Loevinger's Sentence Completion Test (1976) (ego development), assessed self-esteem and ego development in 163 (m=61; f=62) IDJD ages 11 to 19 with a $\bar{x}$ age of 13. The control group contained 53 males and females of approximately the same age. Coopersmith's self-esteem questionnaire consisting of 58 items was administered to both groups and the scores analyzed for their relationship to the independent variables of sex and duration of diabetes. Their findings revealed that diabetic adolescents showed slightly higher levels of self-esteem than the control group. Hauser and his associates (1979) suggested that self-esteem was associated with disease duration with longer duration weakly correlating with lowered self-esteem. More males had lower levels of ego development (L.S.C.), and it was only at lower levels of ego development that diminished self-esteem was demonstrated.

Tavormina, Kastner, Slater and Watt (1976), using 78 male and female insulin dependent diabetic adolescents with a $\bar{x}$ age of 12 administered the Pier-Harris Self-Concept Scale and Psychological Screening Inventory to measure self-concept and other psychological traits. The standardization sample contained 20 adolescents with asthma, 30 with cystic fibrosis, and 16 with hearing impariment. There was no significant

difference between the two groups in self-concept; however, he found the diabetic group more active, aggressive, and more alienated.

Locus of Control

After more than a decade of behavioral research involving the locus of control construct, the usefulness of the distinction made by Rotter (1966) between an internal and external person is accepted and has been given a significant amount of literary attention (Lowery; DuCette, 1976, p. 358). It has been substantiated that internal persons who believe a contingent relationship exists between actions and outcomes will respond differently in situations than persons who think that effort and reward are uncorrelated (Joe, 1971; Throop; MacDonald, 1971). Congruent with this is the idea that negative experiences over which a person has little or no control are conducive to the development of high level beliefs in external control and low level beliefs in internal control (Wallston; Wallston, 1981, p. 23).

Development of Health Locus of Control

The Multidimensional Health Locus of Control Scales (MHLC) have been developed to determine that the source of reinforcements for health related behaviors is primarily internal (internals), a matter of chance (externals), or under the control of powerful others (externals). These scales are based upon and have positive correlation with the earlier Health Locus of Control Scale (Wallston; Wallston; Kaplan; Maides, 1976), which was developed from Rotter's Locus of Control I-E construct (Wallston; Wallston, 1981, p. 33).

Lowery and DuCette (1976) used a sample group of 30 newly diagnosed, 30 three-year duration, and 30 six-year duration male and female diabetic between the ages of 25 and 65 and determined locus of control by using Rotter's Internal-External Control Scale (1966). The group was also given a diabetic and health ifnormation test developed for this study, and data were assimilated from patient records to determine disease control. This study provided support for the idea that initially internal diabetics were under better control and more active seekers of information than externals. However, knowledge seeking behavior and individual disease control diminished with the duration of the disease until there were no differences demonstrated between the groups at the six-year level. The authors of this study hypothesized that the unpredictable nature of diabetes leads internals to an awareness that their usual knowledge-seeking response does not lead to control; therefore, after a period of time they respond by relinquishing their control. Some researchers question this finding. Because of the cross-sectional nature of this study caution must be exercised in drawing conclusions (Wallston; Wallston, 1981, p. 2).

Increased belief in powerful others has been documented in adult diabetics, N=29 with $\bar{x}$ age = 58.5 (Nagy, 1979), and persons with chronic disease (N=609) when compared to college-age students (N=749). The chronic disease group were found by Wallston and Wallston to have slightly lowered beliefs in health internality and relatively high beliefs in health externality, chance and in particular, powerful others (1981, p. 32). This dimension could be interpreted as the chronically ill person's dependence on direction from health professionals.

According to MHLC designers Wallston and Wallston, although self-esteem has been positively correlated to internality (r=+.4) in Rotter's internal-external control construct (Rotter, 1966; Phares, 1976), there has been no research published correlating a health locus of control with self-esteem. Of importance to nursing is the statement of the authors of the MHLC that the scale is not a research tool but rather should be used as a clinical instrument to measure one aspect of a person's health belief system at a given point in time (Wallston; Wallston, 1981, p. 58).

Related Research on Psychosocial Factors

Two themes are especially salient in literature involving the psychosocial aspects of IDJD; these are: (1) Is there unique psychopathology associated with IDJD which would affect the adolescent in his developmental progression? and (2) How IDDM adolescents who are in "good" control differ psychologically from those whose control is "poor."

In an early paper on the role of bodily illness on the child's mental life, Anna Freud (1953) hypothesized that chronic illness could have a lasting effect on the personality of the child.

Fallstrom (1974) using 59 males and females ages seven to 15 with a matched control used the Rorschach and Blacky Picture Test to measure body image perceptions, ego structure, depression, anxiety, aggressiveness, identity problems, and peer relationship problems. He found the IDJD more disturbed on all measures. McCraw and Tuma (1977) administered the Rorschach to 25 IDDM adolescents ($\bar{x}$ age = 12 years) with a matched control group and found no differences between the groups.

Kubany, Danowski and Moses (1956) administered the MMPI to 14

IDJD with a $\bar{x}$ age of 18 and found no abnormal personality traits. Laron, Karp and Frankel (1972) tested 100 male and female IDDM adolescents with a $\bar{x}$ age of 15 years with a matched control group using the Rosenzweig Picture Frustration Test. The diabetic group exhibited more intrapunitive responses and were less conforming. Stersky (1963), interviewing 145 IDJD ages seven to 20 with a matched control group, reported relatively normal mental health with no significant difference between the two groups concerning abnormal mental symptoms or school achievement.

Steinhauser, Borner and Koepp (1977) tested 56 IDJD with a $\bar{x}$ age of 13 and a matched control group using the Children's Personality Questionnaire. This test is used to determine emotional lability, timidity, dependency, conformity, tenseness and self-control. No differences were noted between the sample and control groups. Using 50 IDJD with a matched control group of the same number, Swift, Seidman and Stein (1967) did an evaluation which included a psychiatric interview, a battery of psychological testing, interviews with parents and a medical rating of diabetic control. The IDJD group was found to have more emotional and behavioral problems than the control group in all areas, including self-esteem. However, psychological characteristics significantly related to good control were normal dependence-independence behavior and adequate self-perception. Belmonte (1963) noted severe emotional problems in childhood diabetes mellitus but emphasized that the most serious psychological problems of IDJD are deeply rooted in pre-existing emotional conflicts which the diabetic condition has only served to reinforce or bring to the surface.

Because many investigators believed that diabetic disease

instability is associated with complications, an appreciable amount of research has been directed at the psychological factors which might be associated with good vs. poor diabetic control. Incidence data suggest that the number of children in poor control rises during adolescence and then declines (Fallstrom, 1974; Koski, Kumento, 1977; Ludvigsson, 1977). Minuchen, Rosman and Baker (1978) hypothesized that psychological factors can influence diabetes in adolescence in two ways: (1) by emotional disturbances resulting in behavioral problems (e.g., non-adherence to diabetic regimen), or (2) emotional disturbance may cause metabolic derangements directly through psychophysiological mechanisms.

Carefully controlled laboratory approaches by several investigators as to the effects of emotional stress on adolescent diabetics have revealed conflicting data on blood glucose levels, but all the studies consistently report that induced stress produces a rise in the free fatty acids, blood level, and a rise in urine volumes (Efendic; Cerasi; Luft, 1974; Vandenbergh; Sussman; Titus, 1966; Baker; Barcai; Kay; Hague, 1969).

Psychosocial factors have long been considered crucial to diabetic stability, but the relationship between psychosocial factors and diabetes is complex and the studies that have been conducted have generated conflicting and divergent findings. Ludvigssen (1977) reports that knowledge, plus a positive attitude about diabetes, is associated with adequate diabetic management. The importance of the adolescent's positive attitude toward diabetes was emphasized in Sullivan's work (1979) when she observed that positive attitudes, high self-esteem and adequate psychological adjustments were positively correlated.

Chapter 3

RESEARCH METHOD AND DESIGN

In this descriptive survey the investigator undertook to describe rather than manipulate or control the relationship among variables. Every precaution was taken to establish unified observational conditions, frame appropriate questions, record data, and utilize an equitable schedule so that the reliability of the sample and data was protected. The standards used to classify, compare and quantify the data as outlined in this chapter were valid.

See Appendix A for consent letters from Committee on Human Studies, American Diabetes Association, subject/parent, and medical records consent.

The Variables

The Measured Variables

The measured variables of this study were self-esteem and health locus of control levels of the sample.

Extraneous Variables

Extraneous variables that could not be controlled included the IDJD adolescents' (a) educational background, (b) emotional climate of their nuclear family, (c) individual motivation, (d) previous test taking, and (e) willingness for personal disclosure.

Recorded Variables

Recorded variables that were not controlled but data regarding such were collected and analyzed included: (a) age (Travis, 1963), (b)

sex (Hauser; Pollets, 1979), (c) race (Rosenberg, 1972), (d) family status (Simonds, 1977), (e) socioeconomic status (Hollingshead, 1958), (f) birth order (Rosenberg, 1972), (g) diabetic control at camp (Phares, 1976), (h) diabetic control in general (Simonds, 1976), (i) disease duration (Rosenbloom; Silverstein; Lezotte; Richardson; McCallum, 1981), (j) self/parent disease management (Drash, 1979), (k) genetic factors (Craighead, 1978), and (l) height and weight (NCHS, 1976).

See Appendix B for data-gathering sheet.

The Sample

Selection Criteria

The target population is insulin-dependent juvenile diabetic adolescents. The sample for this study was a nonrandom convenience cluster group of 91 male and female adolescents who attended a summer camp sponsored by the American Diabetes Association of Southern California (ADASC) in July, 1980. The study group included IDDM adolescents who: (1) had had diabetes mellitus for greater than one year duration, (2) were between 13 and 16 years of age, (4) were within the 3rd and 97th percentile for age-appropriate physical size (NCHS, 1976), (4) had no documented diabetic complication, (5) did not have a chronic illness other than IDDM, (6) were stable in regard to diabetic hypoglycemia or hyperglycemia at the time of testing, (7) were able to read and understand English, and (8) had consented individually as well as having parental consent (Langham, 1979) to their being tested (see Appendix A). Coming from an area of approximately 115,000 square miles encompassing the region of Southern California from San Luis Obispo to the Mexican

border, the sample was felt to be representative of the socioeconomic range of the population (Hollingshead, 1958).

Study Setting

The diabetic summer camp was located in the mountains at an elevation of 7,000 feet. Medical supervision was provided by a University School of Medicine. The campers, however, represented a variety of approaches to diabetic management as they came from approximately 60 clinics and private medical practices.

Pilot Study

A total of five tests were given to a small (n=5) group ages 10 to 16 to determine "palatability," readability, and length of time involved in testing. Three tests were eliminated for not meeting certain of the above criteria. The Rosenberg Self-Esteem Scale (RSE) and Wallston and Wallston's Health Locus of Control Scales (MHLC) were retained as the tests best suited to this research.

Instrumentation

Rosenberg's Self-Esteem Scale

Rosenberg's Self-Esteem Scale was administered first (Rosenberg, 1972). This test uses a Likert-type four-point scale with a "strongly agree" to "strongly disagree" response which measures self-regard through Guttman scaling. The test took three to eight minutes to complete and consisted of 10 questions that openly and directly measured self-esteem. These items scored into six subscales. The total

range of scores is 0-6 with a score of 0 to 1 indicating high self-esteem, 2 indicating medium self-esteem, and 3-6 indicating low self-esteem (see Appendix C).

Reliability. The scale instrument was originally administered to 5,024 high school juniors and seniors from 10 randomly-selected high schools in New York state. Using the Guttman procedure, the reproducibility was 92 percent, and the scalability 72 percent.

Validity. Evidence of construct validity appears in the high correlation between the self-esteem scale and (a) a scale of depressive affects, (b) a measure of psychophysiological indicator of anxiety, and (c) adolescents with low self-esteem were found to have lower sociometric scores (Rosenberg, 1972).

Multidimensional Health Locus of Control (MHLC)

The second test administered was the MHLC (Wallston; Wallston, 1978). The three dimensions of health locus of control tested were (1) internality (IHLC); (2) externality, which is powerful others (PHLC); and (3) chance (CHLC). The testing instrument consisted of 18 questions with six questions exploring each area of control. From 0 to 36 points could be scored in each of the three areas. The test took 10 to 15 minutes to complete (see Appendix C).

Reliability. Alpha reliability ranges from .673 to .859 on the IHLC. Alpha = .673 to .830 on PHLC questions, and .753 to .841 on CHLC questions. When the MHLC is correlated to Levinson's three-part scale, alpha = .508 to .733; to Social Desirability scale alpha = .730; and to

Health Status scale alpha = .796, with a positive correlation r = .403 (p=.001) with the IHLC section, and negative with CHLC and PHLC.

Validity. This scale is an improvement of the original Health Locus of Control test (Wallston; Wallston, 1976) that had low alpha reliability. The major factor contributing to prior low internal co-sistency, combining internal and external statements in the same measure has been eliminated. Scales have been developed using a more representative sample for respondents than was used on the HLC. The test scores of the IDJD adolescents in these three areas were compared to scores compiled on college students (n=749) and persons with chronic diseases (n=609) (Wallston; Wallston, 1981).

Testing Instructions

The oral explanation consisted of telling the sample that a survey was being done to find out how they felt about themselves and their health, and that their answers would be compared to those of teenagers who were not diabetic. They were told that there was no right or wrong answer to any question and that they were to go through the questions quickly, marking down their first response.

Lastly, to encourage an honest response, they were told to remove their names from the tests (names were stapled to the front), and they were assured that their names would not be used in any way and their answers would be confidential.

Data Collecting and Recording

Data Collection

The two instruments were administered to the sample group en masse on the second day of camp, to allow for travel fatigue and altitude adjustment (elevation 7,000 feet), and in order to reduce the influence of diabetic peer group on the results. The tests were given in the cafeteria-lodge one hour post midday meal as then, in the medical advisor's opinion, the group would be the most stable in terms of hypoglycemia or hypergylcemia. The medical records were checked on the test day to determine if anyone had a recorded hypoglycemic reaction or was spilling more than 5 percent glycosuria. Neither was found, so none were eliminated at this point. The total testing time was 12 to 25 minutes.

Follow-up interviews were conducted in the 12 cabins, each containing seven to 10 campers. Residents of one to two cabins were interviewed daily at one hour post midday meal (cabin "rest" period). Each personal interview was conducted in five to seven minutes. At this time data were collected that either were not previously available or needed to be correlated with the camper's medical chart. The data included:

1. Adolescent's family marital status;
2. Sibling or birth order position;
3. Genetic factors concerning diabetic incidence in family of origin, with either paternal or maternal side indicated;
4. Diabetic management under adolescent or joint control.

Other information that was obtained from ADASC files and camp

medical records (which contain a medical history from camper's physician) included:

1. Age;
2. Sex;
3. Race;
4. Socioeconomic status, which was determined by using an approximated Hollingshead's Social System Scale;
5. IDDM control at camp, based on urine testing done three times a day by medical staff before meals. Using the two-drop method (Werther; Baum, 1978) glycosuria was determined, and a mean glycosuria computed at the end of the 10-day camp.
6. General control at home was ascertained by number of hospitalizations for diabetic ketoacidosis or hypoglycemia per five-year IDDM period.
7. Vascular complications or presence of a secondary chronic illness as indicated in prior medical records; and
8. Exact height and weight.

See Appendix A for permission to use medical records for study and Appendix B for data collection protocol and symbol recording.

Limitations of Study

This study could be influenced or limited by:

1. Sample size being disproportionate;
2. Cluster type, because of IDDM peer influence and/or presence;
3. Hawthorne effect or an attempt to please the researcher;

4. Unidentified differences between subjects in the sample group and in the published normal or control groups; and

5. Testing location at a diabetic camp. The camp environment could have varied effects on adolescents as relief at seeing that others have diabetes or intensified resistance to facing the reality of having diabetes (Sullivan, 1978, p. 21).

Summary

This chapter has outlined the assumptions and methodology that were utilized in the descriptive approach to determine the self-esteem levels of IDJD adolescents and to analyze what relationships exist between self-esteem and health locus of control.

Chapter 4

DATA PROCESSING AND ANALYSIS

For this descriptive survey the null hypotheses stated were:

1. Insulin-dependent diabetes mellitus will make no difference at the .05 level of significance on the self-esteem of the 13- to 16-year-old adolescent when compared to published normal levels (Rosenberg, 1972).

2. There will be no difference at the .05 level of significance in the internal or external health locus of control of the 13- to 16-year-old IDDM adolescent with high, medium or low self-esteem.

Testing data, demographic data and data obtained during the interview were processed by computer using descriptive and inferential (Chi-square) statistics that tabulated the response information of the sample (Johnson, 1976; Conover, 1971).

The 91 IDDM adolescents of this study were found to be similar to adolescents in Rosenberg's (1972) published sample of 5,042 tested for the variables sex, race, socioeconomic status, birth order, and family marital status. The mean age of the IDDM group was 1.2 years less than those studied by Rosenberg. Table 1 illustrates the mean age and disease duration of the sample. The range for disease duration was 1.3 to 14.1 years in males and 1.0 to 13.6 years in females.

Table 1

Mean Age and Disease Duration

Variables	Males (n=34)	Females (n=57)	Total (n=91)
Age	14.76 ± .96	14.98 ± 1.02	14.90 ± 1.00
IDDM Duration	6.09 ± 3.53	6.95 ± 3.66	6.63 ± 3.61
Age at Onset	8.66 ± 3.09	7.97 ± 3.21	8.23 ± 3.17

Table 2 contains descriptive characteristics of 34 male, 57 female, and the group in total (91). Variables in the table included race, family marital status, socioeconomic status, general IDDM control at home, IDDM control at camp, IDDM duration, genetic factors and IDDM management.

Factors in Table 2 that appeared consistent between male and female adolescents were socioeconomic status, IDDM control in general, IDDM duration, age of onset, and genetic existence of diabetes mellitus in their families.

Apparent disproportionate factors in the descriptive comparison of male and female IDDM adolescents are race distribution, percentage of males living in single-parent homes ($p=.08$), the higher percentage of males in good control while attending camp, and the higher percentage of males who manage their IDDM without parental assistance.

Table 2

Sample Description

Variables	Male (n=34) %	Female (n=57) %	Total (n=91) %
Race			
Caucasian	94.1	80.7	85.7
Non-Caucasian	5.8	19.3	14.3
Family Marital Status			
Intact	35.3	45.6	41.8
Intact Reconstituted	20.6	26.3	24.2
Single Parent	38.2	21.1	27.5
Foster Care	5.9	7.1	6.6
Socioeconomic Status			
II	8.8	12.3	11.0
III	32.4	28.1	29.7
IV	47.1	47.4	47.3
V	11.8	12.3	12.1
General IDDM Control			
Good	55.9	52.6	53.8
Moderate	14.7	10.5	12.1
Poor	29.4	36.8	34.1
IDDM Control at Camp			
Good	47.1	14.0	26.4
Moderate	47.1	71.9	62.6
Poor	5.9	14.0	11.0
IDDM Duration			
1-2.9 years	26.5	17.5	20.9
2.9-5.9 years	20.6	26.3	24.2
Over 6 years	52.9	56.1	54.9
Genetic Factors			
Yes	52.9	56.1	54.9
No	47.1	43.9	45.1
IDDM Management			
Adolescent	70.6	50.9	58.2
Joint	29.4	49.1	41.8

Hypothesis One

Insulin-dependent juvenile diabetics will make no difference at the .05 level of significance on the self-esteem of the 13- to 16-year-old adolescent when compared to published normal levels (Rosenberg, 1972).

Table 3a contains Rosenberg's and the sample percentage levels of high, medium and low self-esteem. Table 3b contains the Chi-square analysis of the two groups, showing the number observed in high, medium and low and the numbers expected in these areas based on Rosenberg's self-esteem levels.

There is no significant difference between the sample population and Rosenberg's published levels of self-esteem, or adolescents who do not have insulin dependent diabetes mellitus. Therefore, null hypothesis one was retained.

Table 3a

Rosenberg and Sample Percentage Levels

Self Esteem	Sample (n=91)	Rosenberg (n=5,204)
High, 0-1	41.8%	45%
Medium, 2	26.4%	25%
Low, 3-6	31.9%	30%

Table 3b

Chi-Square Analysis Comparing Sample to Rosenberg

Group	01	02	3-6	Total
Obs.	38	24	29	91
Exp.*	41	23	27	91

$\chi^2 = .411$ df = 2 Critical Value 6.00

*Expected values for Chi-square are based on percentages from the Rosenberg Sample.

Hypothesis Two

There will be no discernible difference in the internal or external health locus of control of the 13- to 16-year-old IDDM adolescent with high, medium or low self-esteem.

Table 4 compares the health locus of control of the sample of 91 IDDM adolescents tested with published means or levels for 1,194 non-IDDM college students and 609 persons with various chronic diseases including diabetes mellitus. With the health locus of control classified as Internal (Internal) and External (Chance and Powerful Others), the sample scored higher in internality levels than Wallston and Wallston's (1981) college students and chronic disease population of mixed ages. There was no difference between the chance scale level of the sample and Wallston and Wallston's (1981) college group; however, the sample demonstrated a higher level of powerful other externality than the college group, but a lower level than the chronic disease group (Wallston; Wallston, 1981).

Table 4

Mean Health Locus of Control Levels

	Internal	External	
Variables	Internal	Chance	Powerful Others
College Students n=1194	26.68	16.72	17.87
Chronic Disease n=609	25.78	17.64	22.54
IDDM Adolescent Sample n=91	27.28 (28)*	16.86 (16)*	20.26 (20)*

*Median

The median test (Conover, 1971) was employed to determine the sample median for the internal, chance and powerful others scales. The median is the number which is exceeded by about half of the observations in the sample array, and is an objective yardstick for separating population values. (See Appendix D for number distribution of Health ILC, CLC, and PLC.)

Table 5 contains the median value of the sample's internal, chance and powerful other scales. Inferential statistics using Chi-squares were done to determine the relationships between the sample's high, medium and low self-esteem, and their internal, chance or powerful others' locus of control median levels. As no significant relationships were found, hypothesis two was retained.

Table 6 shows the relationship between self-esteem and other characteristics or variables in the total sample. Chi square statistics were used with levels of each of the indicated variables compared for the three levels of self-esteem. Tests were also run separately for males and females.

There was significance shown only in the linking of lowered self-esteem and poor general control in males ($p=.005$).

Table 7 shows the relationship between internal health locus of control, chance health locus of control, powerful others health locus of control, and other characteristics of the total sample. Chi square statistics were used with levels of each of the indicated variables compared with the three scales of health locus of control. Tests were also run separately for males and females.

Table 5

Median Test and Chi Squares for Self-Esteem and Internal, Chance, and Powerful Others Health Locus of Control

Health Locus of Control		Self Esteem High	Medium	Low	Total
INTERNAL					
External	<28	19	13	18	50
Internal	≥28	19	11	11	41
TOTALS		38	24	29	91
$\chi^2 = .97$	df = 2	p = .61 (N.S.			
CHANCE					
Internal	≥16	23	13	13	49
External	<16	15	11	16	42
TOTALS		38	24	29	91
$\chi^2 = 1.63$	df = 2	p = .44 (N.S.)			
POWERFUL OTHERS					
Internal	≥20	20	15	14	49
External	<20	18	9	15	42
TOTALS		38	24	29	91
$\chi^2 = 1.10$	df = 2	p = .57 (N.S.)			

Table 6

P-values for Chi Square Tests to Determine Relationship of Self-Esteem to Sample Variables

Characteristics in Relation to Self-Esteem	Results		
	Total	Males	Female
Family Marital Status	.17 N.S.	N.S.	N.S.
Socioeconomic Status	.31 N.S.	N.S.	N.S.
General Disease Control*	.007 Sig.	.005	N.S.
Camp Disease Control	.87 N.S.	N.S.	N.S.
Diabetic Duration	.68 N.S.	N.S.	N.S.
Manage IDDM at Home	.43 N.S.	N.S.	N.S.
Genetic Factors	.63 N.S.	N.S.	N.S.

*Lowered self-esteem associated with poor general control in males

Table 7

Relationship of Health Locus of Control to Sample Variables

Characteristics	P-Values			Results	
	IHLC	CHLC	PHLC	Male	Female
Family Marital Status	.47	.90	.90	N.S.	N.S.
Socioeconomic Status	.90	.12	.67	N.S.	N.S.
General Disease Control †	.02/.23	.83	.76	Sig.	N.S.
Camp Disease Control †	.59	.06/.06	.96	N.S.*	N.S.*
Diabetic Duration	.72	.20	.37	N.S.	N.S.
Manage IDDM at Home †	.59/.07**	.81	.84	N.S.	N.S.**
Genetic Factors	.28	.69	.97	N.S.	N.S.

*Trend Toward Significance, Males and Females
**Trend Toward Significance, Females Only
†Males/Females

There was significance (p=.02) shown in the number of internal males who were in good general control. There was a significant trend toward internality (p=.07) in females who managed their IDDM independently. Lastly, there was a significant trend (p=.06) of external males and females highly scored on the chance locus of control scale whose diabetic control (glycosuria) improved during the 10 days of camp regimentation.

Discussion and Summary

Hypothesis One

The results of the Rosenberg Self-Esteem Test administered to 91 IDDM adolescents did not show statistical difference between the IDDM adolescent sample and the group represented by Rosenberg's published normal levels (1972). This was an unexpected finding as several researchers have identified psychological problems including altered self-esteem in IDDM adolescents as a group (Swift, and Others, 1967; Kaufman; Hersher, 1971). The self-esteem score range was similar to the Sullivan (1979) study with the exception that this sample did not show more lowered self-esteem scores in the medium and lower ranges. This sample was also different from Hauser and associates (1979) in that his study found higher levels of self-esteem in his IDDM sample than in his control group.

Although there was not a statistical relationship shown between high self-esteem and good general diabetic control, the significant linking (p=.005) of poor self-esteem and poor general diabetic control in the sample's males gives credence to the assumption that some IDDM

adolescents with low self-esteem have not developed competent diabetic control or wellness behaviors. This concurs with Bruhn's (1977) theory that adolescents who have difficulty in the control of diabetes often have negative self-concepts, feel powerless, hopeless, and, therefore, become lax about following their diabetic regimen.

Hypothesis Two

The results of the Multidimensional Health Locus of Control test that was administered to 91 IDDM adolescents did not show statistical differences between the health locus of control scores and high, medium or low self-esteem. There has been no published documentation to date concerning health locus of control levels in IDDM adolescents. Therefore, investigating health locus of control in relation to specific attitudes (self-esteem) and recorded behaviors substantiated the value of this construct.

Because the Internal, Chance, and Powerful Other dimensions are individual scales, it is conceivable that an adolescent with his tendency to "overstate" as a coping mechanism in maturation (Bruhn; Cordova, 1977) can score a positive level in one, two or all three areas. For this reason it is prudent to approach each dimension separately and describe significant content.

Internal health locus of control. The sample population scored higher in internality levels than Wallston and Wallston's (1981) college students and chronic disease population of mixed ages. There was a significant number ($p=.02$) of internal males who were in good general diabetic control. This was not demonstrated as dramatically in female

adolescents (p=.23); however, there was a significant trend toward internality (p=.07) in females who managed their IDDM independent of parental assistance or in a self-determined construct. Lowery and DuCette (1976) found that internality diminished with disease duration in IDDM adults. This was not found to be true in the sample. A Chi-square was done comparing disease duration to general control and no difference was found in this IDDM adolescent group.

See Appendix D for Table 8, Internal Health Locus of Control Array.

Chance health locus of control. There was no difference between the chance scale level of the sample and Wallston and Wallston's (1981) college group. As was also demonstrated by Wallston and Wallston, a greater number of chance-controlled adolescents (p=12) were of lower socioeconomic status. There was a significant trend in the number of external males and females (p=.06) whose diabetic control (glycosuria) improved in the camp environment.

See Appendix D for Table 9, Chance Health Locus of Control Array.

Powerful others health locus of control. As was predicted the sample group demonstrated a higher level of reliance on powerful others than Wallston and Wallston's college group. However, they demonstrated a lower level of external reliance than Wallston and Wallston's chronic disease group of mixed ages (1981).

Though there was a physician/camper ratio of approximately 1:12, in 24-hour attendance, inferential statistics did not demonstrate any causal relationship between powerful others (health professionals) and

disease control while at camp. Moreover, the Chi square test did not reveal significant relationships between the remaining variables and the powerful others scale.

See Appendix D for Table 10, Powerful Others Health Locus of Control Array.

A major difference became apparent in comparing health locus of control and disease behavioral characteristics of the IDDM males and females. Although significantly more ($p=.07$) internal females assumed full responsibility for their diabetic management than external females, this was not true for the male sample. Of the IDDM males, 70.6 percent took full responsibility for diabetic management. This number included 62.9 percent of the external males and 71.4 percent of the internal males.

Chapter 5

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

It has been documented that adherence to a diabetic regimen or diabetic wellness behavior minimizes or prevents the far-reaching complications of the disease (Cahill, and Others, 1976). Incidence data show that poor control in IDDM children rises during adolescence, then recedes in adulthood (Fallstrom, 1974).

Although self-esteem testing of IDDM adolescents had been documented, levels reported were in variance. There was a paucity of literature concerning the effect of high, medium or low self-esteem on diabetic control.

In considering the psychological and psychosocial adjustments required to prevent poor control and promote wellness behavior, it was felt that psychological dimensions of the IDDM adolescent merited closer study. For this reason a descriptive survey was undertaken to establish a baseline of self-esteem and health internality and externality levels and determine if there was a relationship between self-esteem and health locus of control in the IDDM adolescent.

Hypothesis One

The first hypothesis stated that there would be no difference found between self-esteem levels of IDDM adolescents and published normal levels. Chi square statistics comparing adolescents in this study with norms on the Rosenberg (1972) self-esteem placed the IDDM

adolescents within the normal range. A relationship between high self-esteem and good diabetic control or wellness behavior was not observed, and the first hypothesis was retained. However, there was a significant ($p=.005$) relationship between poor diabetic control and low self-esteem in males.

Nursing Implications, Goals and Strategies Related to Self-Esteem

As a result of this study, nursing implications include screening IDDM adolescents to ascertain self-esteem levels that might potentiate poor diabetes control. Nursing goals are to: (1) increase the adolescents' positive feelings about themselves physically, psychologically and socially; (2) teach adolescents to better communicate with peers, parents and health professionals; (3) increase IDDM adolescents' feelings of responsibility toward themselves and society; and (4) promote development of a view that one's wellness/diabetic control is important because wellness behavior enhances well being.

Nursing strategies that could be considered for making clients aware of the transitions they are going through as an adolescent with IDDM are: (1) individual counseling to introduce the concepts of healthy self-esteem so that they can value themselves as unique and worthy; (2) introduction of IDDM adolescents to an organized values clarification and decision-making process (Hopp, 1976) so that they understand their goals and how to achieve them; and (3) promotion of regularly-scheduled group meetings for IDDM adolescents that have structured discussions with their peer group including problem solving peculiar to IDDM (Barksdale, 1978; Ball, 1977).

Hypothesis Two

The second hypothesis dealt with determining internal, chance, and powerful others locus of control in IDDM adolescents and examining the possibility of a relationship between health locus of control and self-esteem. Inferential statistics failed to establish a relationship between internal or external health locus of control and high, medium or low self-esteem, so that hypothesis two was retained.

Looking for relationships involving wellness behavior and locus of control it was observed that there were a significant number of internal males ($p=.02$) who were in good general diabetic control. Although both internal and external males (70.6 percent of male sample) demonstrated wellness behaviors by disease self-management (Bruhn, 1977) only internal females showed a trend ($p=.07$) toward self-management. Perhaps this is a reflection of cultural expectations for males and females. Females in our society are permitted or even encouraged to assume a more dependent role in health and illness (Kohlberg, 1966). Both males and females who scored high levels in the chance locus of control scale showed a significant trend ($p=.06$) toward wellness behavior in the environment of diabetic camp, implying that the regimentation, peer support and frequent reinforcement present in an externally oriented group program can yield success (Wallston; Wallston, 1978).

Recommendations for Nursing Interventions and Strategies Related to Health Locus of Control

Recommendations for nursing interventions include a screening process to determine the IDDM adolescent's internality or externality.

Nursing strategies would include tailoring the nursing process to interact with locus of control in promoting wellness behavior by (1) engaging internal adolescents in more independent self-regulated learning experiences (Dupuis, 1980) and (2) placing external adolescents in group situations where they would profit from positive suggestion, frequent reinforcement and peer support.

Recommendations for Additional Research

A future research direction would be a longitudinal investigation to determine if the self-esteem levels of this sample were the result of a transient interruption or sustained. Also of importance in this type of study would be the implementation of a program to raise self-esteem and determine the effect on diabetic control. In order to do this, subjects would need to be followed over a period of several years of their development progression, beginning with latency or very early adolescence (Grey; Genel; Tamborlane, 1980).

Another area to study within the constructs of both self-esteem and locus of control is the family environment. It would be important to determine how the family influences the development of wellness behaviors in terms of interactions, role-modeling and general stability. Conversely, it would be valuable to know how the IDDM adolescent affects their family's developmental progression.

Research attempting to relate health locus of control beliefs to health behaviors would involve using health locus of control testing as a clinical tool. An individual would be given a battery of tests and the clinician would use the resultant profile in planning an individual

wellness program. Systematic evaluation of the program's usefulness would be in order.

Research in health locus of control has failed to take into account "actual" control in situations as well as preferences for control. The consensus that internal is best is being questioned (Wortman; Dunkel-Schetter, 1979). Researchers using locus of control for behavioral compliance need to become more aware of how their expectancies for control interface with the reality of the client's environmental incertitude.

A final proposal would be to combine behavioral testing, i.e., self-esteem, health locus of control with more invasive testing, in particular drawing blood samples from each subject and testing for levels of glycosylated hemoglobin (HbA_{1c}). This nursing research would be in conjunction with or under the auspices of medical research. A limitation in descriptive surveys that involve behavioral testing can be the subject's reluctance for personal disclosure, whereas testing levels of HbA_{1c} would give a far more accurate picture of the IDDM adolescent's general diabetic control or wellness behaviors of the past. It was demonstrated by HbA_{1c} testing the first and last days at a 25-day externally-controlled camp in Austria (Pollak; Widhalm; Havelec; Frisch; Schober, 1980), that diabetic control was significantly ($p=.05$) improved during that time frame. Using the umbrella approach of the entire health team, which would also include the client, it would be of merit to employ physiological as well as psychological testing in the investigation and understanding of diabetic adherence or wellness behaviors of the IDDM adolescent.

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APPENDIX A

CONSENTS AND PERMISSION LETTERS

LOMA LINDA UNIVERSITY

GRANTS RESOURCES SERVICE

Loma Linda Campus
LOMA LINDA, CALIFORNIA 92350
La Sierra Campus
RIVERSIDE, CALIFORNIA 92515

July 28, 1980

Janice Mace
% Clarice Woodward
School of Nursing
Loma Linda University
Loma Linda, CA. 92350

Dear Mrs. Mace:

Your proposal for a study entitled "A Comparison of Self-Esteem and Locus of Control in Teenage Juvenile Diabetics" was reviewed by the Committee on Human Studies of Loma Linda University at its regular meeting held on July 9, 1980.

The actions of the Committee are as follows:

The subjects are at minimal risk.
The protocol is approved.

If there are any modifications to the proposed research protocol or consent form, or problems arising from the study, please notify the Committee in writing of these changes or problems. If you have questions, please feel free to contact us.

You will be asked to provide a progress report on this study in one year indicating the number of subjects enrolled.

Best wishes for success in this project.

Sincerely yours,

Bruce Wilcox

Bruce Wilcox, PhD
Chairman, 1979-80
Committee on Human Studies

BW:aj

Date: 30 June 1980

Dear: Janice Mace

Your request for permission to collect data for your research project at ADASC Camp Chimacek has been received and reviewed. The following action has been taken:

X You have my permission to conduct your study in our facility.

___ Your request has been temporarily denied pending provision of additional information.

___ Your request cannot be granted at this time.

Also, it will be necessary for you to:

___ Obtain permission from the attending physician since your study involves patients and/or their records.

___ Obtain additional permission from _____.

___ Notify and/or advise the following persons of your study.

___ Make an appointment with _____ for additional discussion and information provision.

___ Other

If I can be of further help, please let me know.

Sincerely,

Marsha H. Porter
Executive Director
American Diabetes Association

This form needs to be signed and returned to the ADASC Office ONLY if you do not wish your teenager to participate.

Dear Parent:

We are conducting a survey comparing Diabetic vs. Nondiabetic teenagers. This will be done using short, standardized tests of attitude and self-esteem.

There are no known risks associated with the tests and they will only take about 20 minutes of your teenager's time. The information obtained will be strictly confidential, and no camper's name or identity will be released or published.

The potential benefits of this survey would include a better understanding of the relationship between some aspects of self-perception and diabetes control, and thus lead to better teenage diabetic care on the part of the health profession.

Although we urge your teenager's participation, this study is voluntary. Any decision against participation would not in any way affect his or her camping experience. Thank you for your cooperation.

Sincerely yours,

Janice Mace, R.N., B.S.

* * * * *

I have read the contents of this consent letter and questions concerning this study have been answered to my satisfaction. I may call Mrs. Mace at (714) 793-5881 if I have any additional questions or concerns.

Having read the above letter, I do not wish to have my child participate.

_____ _____

Signature of Camper Date

_____ _____

Signature of Parent or Guardian Date

(If you do not wish to participate, please sign both of the above lines and return this form with your Camp Chinnock departure forms.)

American Diabetes Association
SOUTHERN CALIFORNIA AFFILIATE, INC.

1127 CRENSHAW BLVD., LOS ANGELES, CA 90019 — (213) 938-7271

MEDICAL CONSENT FORM

This form must be signed and returned for child to meet eligibility requirements.

_____
(Camper's name in full)

will be attending CAMP CHINNOCK for two weeks this summer.

Permission is given to representatives of the AMERICAN DIABETES ASSOCIATION, SOUTHERN CALIFORNIA AFFILIATE, INC. to render usual and customary health care for Juvenile Diabetes Mellitus.

I understand that any part of my child's medical records may be used for medical care and related purposes.

In addition, in case of emergency, I authorize the Camp Medical Director or his representative to approve any necessary medical care.

Signed: _____
(Parent or Guardian)

Signed: _____
(Parent or Guardian)

Date: _____

APPENDIX B

DATA GATHERING TOOL
PROTOCOL AND SYMBOLS FOR DATA ANALYSIS

DEMOGRAPHIC DATA

I.D. #	Age	Ht/Wt	Sex	R	Family Status	SES	MC	Vas Comp	Control		Age Onset	JDM Dura.	Genetic		Sib. Pos.	JDM	Rosen-berg	MHLC		
									Gen	Camp			M	P				ILC	CLC	PLC

PROTOCOL AND SYMBOLS FOR DATA ANALYSIS OF SAMPLE VARIABLES

Family Marital Status

I = Intact, family of origin
IR = Intact reconstituted--remarriage of Mother or Father
SP = Single parent
FC = Foster care
M = Mother
F = Father
S = Step-parent
D = Deceased

Socioeconomic Status

Socioeconomic status was designed on an approximated Hollingshead (1958) social system scale, which is based on parental occupation, estimated educational level of parents, and place of residence.

Class	I	1-2%	Upper class, college educated, non-working wives
	II	15%	Upper middle class, managerial, well-to-do, civic leaders, college educated, professionals
	III	22%	Middle class, strivers, may own business, woman employed, protestant work ethics, high school educated
	IV	45-50%	Working class, may be ethnic oriented, blue-collar job, wages, high school or less
	V	15-20%	Lower class, ethnic minorities, high school or less, crowded living conditions, unskilled labor or unemployed

General Disease Control

General disease control was ascertained by number of hospital admissions for diabetic ketoacidosis or hypoglycemia per five-year IDDM period.

G - Good control--1/5 year period of IDDM
M - Moderate control--2/5 year period of IDDM
P - Poor control--3+/5 year period of IDDM

Camp Disease Control

Camp disease control was based on urine testing done three times a day by medical staff before meals. Using the two-drop method (Werther, 1978), glycosuria was determined and camp control was based on the mean

urine glycosuria for each subject that was computed at the end of the 10-day camp.

G - Good control--$\bar{x}$ of 2% or less urine glucose
M - Moderate control--$\bar{x}$ of >2% to 3.5% urine glucose
P - Poor control--$\bar{x}$ of >3.5% urine glucose

Diabetic Duration

Diabetic duration was based on three groupings.

Group I - 1 to 2.9 years
Group II - 2.9 to 5.9 years
Group III - 6 and greater than 6 years

Manage IDDM at Home

Manage IDDM at home was ascertained by disease management done by

A - the adolescent independently, which would include insulin computing and injections, dietary intake determined, exercise needs evaluated, and urine or blood testing.

J - a joint responsibility for disease control by the adolescent and his parent(s).

M or P - maternal or paternal responsibility for major control.

Genetic Factors

Genetic factors concerned incidence of diabetes mellitus (IDJD or adult onset) in family of origin, with either maternal or paternal side indicated.

APPENDIX C

TESTING INSTRUMENTS

Rosenberg Self-Esteem Scale

Below is a list of statements dealing with your general feelings about yourself. If you agree with the statement, circle A. If you strongly agree, circle SA. If you disagree, circle D. If you strongly disagree, circle SD.

	Strongly Agree	Agree	Disagree	Strongly Disagree
1. On the whole, I am satisfied with myself.	SA	A	D	SD
2. At times I think I am no good at all.	SA	A	D	SD
3. I feel that I have a number of good qualities.	SA	A	D	SD
4. I am able to do things as well as most other people.	SA	A	D	SD
5. I feel I do not have much to be proud of.	SA	A	D	SD
6. I certainly feel useless at times.	SA	A	D	SD
7. I feel that I'm a person of worth, at least on an equal plane with others.	SA	A	D	SD
8. I wish I could have more respect for myself.	SA	A	D	SD
9. All in all, I am inclined to feel that I am a failure.	SA	A	D	SD
10. I take a positive attitude toward myself.	SA	A	D	SD

Multidimensional Health Locus of Control

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
1. If I get sick, it is my own behavior which determines how soon I get well again.	1	2	3	4	5	6
2. No matter what I do, if I am going to get sick, I will get sick.	1	2	3	4	5	6
3. Having regular contact with my physician is the best way for me to avoid illness.	1	2	3	4	5	6
4. Most things that affect my health happen to me by accident.	1	2	3	4	5	6
5. Whenever I don't feel well, I should consult a medically-trained professional.	1	2	3	4	5	6
6. I am in control of my health.	1	2	3	4	5	6
7. My family has a lot to do with my becoming sick or staying healthy.	1	2	3	4	5	6
8. When I get sick I am to blame.	1	2	3	4	5	6
9. Luck plays a big part in determining how soon I will recover from an illness.	1	2	3	4	5	6
10. Health professionals control my health.	1	2	3	4	5	6
11. My good health is largely a matter of good fortune.	1	2	3	4	5	6
12. The main thing which affects my health is what I myself do.	1	2	3	4	5	6
13. If I take care of myself, I can avoid illness.	1	2	3	4	5	6

Multidimensional Health Locus of Control
Page 2

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
14. 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
15. No matter what I do, I'm likely to get sick.	1	2	3	4	5	6
16. If it's meant to be, I will stay healthy.	1	2	3	4	5	6
17. If I take the right actions, I can stay healthy.	1	2	3	4	5	6
18. Regarding my health, I can only do what my doctor tells me to do.	1	2	3	4	5	6

APPENDIX D

TABLES 8-10

Table 8

Internal Locus of Control Array

Code	Frequencies			
	Absolute	Relative %	Adjusted %	Cumulative %
15	1	1.1	1.1	1.1
16	2	2.2	2.2	3.3
17	2	2.2	2.2	5.5
18	2	2.2	2.2	7.7
19	2	2.2	2.2	9.9
21	1	1.1	1.1	11.0
22	1	1.1	1.1	12.1
23	5	5.5	5.5	17.6
24	3	3.3	3.3	20.0
25	7	7.7	7.7	28.6
26	10	11.0	11.0	39.6
27	9	9.9	9.9	49.5
28	5	5.5	5.5	54.9
29	11	12.1	12.1	67.0
30	10	11.0	11.0	78.0
31	4	4.4	4.4	82.4
32	3	3.3	3.3	85.7
33	6	6.6	6.6	92.3
34	4	4.4	4.4	96.7
35	1	1.1	1.1	97.8
36	2	2.2	2.2	100.0
Total	91	100.0	100.0	

Mean: 27.286 Mode: 29.000 Standard Deviation 4.703
Median: 27.600

Table 9

Chance Health Locus of Control Array

Code	Frequencies			
	Absolute	Relative %	Adjusted %	Cumulative %
8	4	4.4	4.4	4.4
9	6	6.6	6.6	11.0
10	5	5.5	5.5	16.5
11	4	4.4	4.4	20.9
12	7	7.7	7.7	28.6
13	3	3.3	3.3	31.9
14	8	8.8	8.8	40.7
15	8	8.8	8.8	49.5
16	4	4.4	4.4	53.8
17	5	5.5	5.5	59.3
18	4	4.4	4.4	63.7
19	6	6.6	6.6	70.3
20	4	4.4	4.4	74.7
21	5	5.5	5.5	80.2
22	7	7.7	7.7	87.9
23	1	1.1	1.1	89.0
24	2	2.2	2.2	91.2
25	1	1.1	1.1	92.3
26	3	3.3	3.3	95.6
28	1	1.1	1.1	96.7
30	1	1.1	1.1	97.8
32	1	1.1	1.1	98.9
62	1	1.1	1.1	100.0
Total	91	100.0	100.0	

Mean: 16.868 Mode: 14.000 Standard Deviation: 7.247
Median: 15.625

Table 10

Powerful Others Health Locus of Control Array

	Frequencies			
Code	Absolute	Relative %	Adjusted %	Cumulative %
8	1	1.1	1.1	1.1
10	1	1.1	1.1	2.2
11	1	1.1	1.1	3.3
13	4	4.4	4.4	7.7
14	6	6.6	6.6	14.3
15	5	5.5	5.5	19.8
16	5	5.5	5.5	25.3
17	3	3.3	3.3	28.6
18	7	7.7	7.7	36.3
19	5	5.5	5.5	41.8
20	11	12.1	12.1	53.8
21	9	9.9	9.9	63.7
22	5	5.5	5.5	69.2
23	8	8.8	8.8	78.0
24	5	5.5	5.5	83.5
25	2	2.2	2.2	85.7
26	2	2.2	2.2	87.9
27	1	1.1	1.1	89.0
28	3	3.3	3.3	92.3
29	1	1.1	1.1	93.4
30	2	2.2	2.2	95.6
31	2	2.2	2.2	97.8
32	1	1.1	1.1	98.9
33	1	1.1	1.1	100.0
	91	100.0	100.0	

Mean: 20.264 Mode: 20.000 Standard Deviation: 5.138
Median: 20.182