

THE EFFECT OF A DIABETES EDUCATION PROGRAM ON SOCIAL
SUPPORT, DIABETES KNOWLEDGE LEVEL, BLOOD GLUCOSE
LEVEL, AND WEIGHT AMONG NONINSULIN-DEPENDENT
DIABETICS

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ABSTRACT

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The effect of a diabetes education program on social support, diabetes knowledge level, blood glucose level, and weight of 60 noninsulin-dependent diabetes mellitus male and female individuals was assessed during a 10-week period. Twenty subjects each were randomly assigned to the education with a social support person present (E+SS) group, the education with no social support present (E-SS) group, and the control group. The social support person was either a family member or friend. Data were analyzed by two-way ANOVAs with repeated measures and t tests for related and independent samples. At the end of the 3-week education program, no significant differences were found between groups on any of the variables measured. Significant differences were found in (a) diabetes knowledge level scores of group E+SS from pretest to posttest 1 and group E-SS from pretest to posttest 2 and (b) blood glucose levels of group E-SS from pretest to posttest 2.

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CHAPTER 1

INTRODUCTION

Western civilization's most common metabolic disease is diabetes mellitus (Sims & Sims, 1986). More than 10 million Americans have diabetes, and approximately 500,000 are diagnosed each year. Diabetes is considered the leading cause of adult blindness, kidney failure, and amputations of limbs due to gangrene. Diabetes mellitus is a major cause of hospitalization disability and suffering, and with its complications, it contributes to at least 7% of all deaths in the United States. Additionally, the majority of heart attacks and strokes are caused by diabetes (Sims & Sims, 1986).

There are two types of diabetes mellitus: insulin-dependent, also called Type I or juvenile-onset diabetes, and noninsulin-dependent diabetes, also referred to as Type II or adult-onset diabetes. The focus of this study was primarily on individuals with noninsulin-dependent diabetes mellitus (NIDDM).

According to Sims and Sims (1986), noninsulin-dependent diabetes mellitus has been commonly referred to as a mild diabetes because of its undramatic symptoms. However, this type of diabetes causes complications in NIDDM individuals

that are as serious as they are in individuals with insulin-dependent diabetes. Type II diabetes is by far the most common form of diabetes. It occurs most frequently in individuals who are over age 40, overweight, female, and who have a history of diabetes in the family. According to the American Diabetes Association (1986), approximately 8 to 9 million Americans have NIDDM and more than 80% are overweight. Consequently, the prevalence of Type II diabetes is between 7 and 10 times greater than that of Type I.

The most basic aspect of living (e.g., food, physical activity) are under the control of the diabetic. Therefore, the individual with diabetes plays a key role in managing the disease. The basic therapeutic modalities for individuals with diabetes are restricted to patient education, dietary counseling, medication, smoking cessation, and exercise (Herman, Teutsch, & Geiss, 1985). Diabetes demands major shifts in the ordinary behaviors of daily living. Type II diabetes necessitates modification of food intake and exercise habits (Cox, Gonder-Frederick, Pohl, & Pennebaker, 1986). Behavioral problems for diabetes are common because of the necessity of long-term adherence to a complicated regimen of diet, exercise, and medicines. Survival and control of disease are dependent on

health-promoting behaviors (i.e., diet, exercise) of the diabetic family. Weight and glycemic control are central to achievement of well-being. Consequently, diabetes challenges the adaptive capacities of diabetics and families (Jacobson & Leibovic, 1984).

Although the diabetic plays a key role in managing the disease, environmental supports such as family and social networks are important mediators of self-management. Involving other family members or friends may be an opportunity for structuring social supports into the treatment process (Tobin, Reynolds, Holroyd, & Creer, 1986). One method to promote environmental milieu for chronically ill patients has been to implement a buddy system where two patients concurrently receive self-management training and are encouraged to rely on one another for emotional support and proficiency of skills performance.

Social support is regarded as a central psychosocial issue in health research and is a field of inquiry central to the goals of nursing (Norbeck, 1986; Wortman & Conway, 1986). Patient education (e.g., diabetes education) is a basic component of nursing care. It is part of the nurse's role to improve the client's level of understanding and thereby promote their health. Nurses assess the support available to patients and find creative ways to supplement

inadequate support. Patient education programs have been implemented in various institutions, but programs frequently have not been evaluated for effectiveness (Garding, Kerr, & Bay, 1988). There is a need for refinement and specification of social support and a need to evaluate the effectiveness of diabetes education as it affects social support and metabolic control. Therefore, the purpose of this investigation was to study the effect of a diabetes education program on social support, diabetes knowledge level, blood glucose level, and weight of noninsulin-dependent diabetics.

Problem of Study

Diabetes is a challenging disease that can have a negative effect on the well-being of the uncontrolled diabetic. Weight and glycemic control are essential for the achievement of well-being. Knowledge level of diabetes and social support are variables that may have some bearing on the well-being of the noninsulin-dependent diabetic. Therefore, the problem of this study was to investigate the question: What effect will a diabetes education program have on social support, diabetes knowledge level, blood glucose level, and weight of noninsulin-dependent diabetics?

Rationale for Study

The devastating effects of diabetes can be described in terms of cost. The cost of medical care is the fastest growing item in the United States consumer price index. According to the American Diabetes Association (1989), the lowest estimates of costs that are directly attributable to diabetes are 13.5 billion annually, about 3.6% of the total health costs in the United States. An estimated 75% of the general population have symptoms severe enough to warrant attention with respect to treatment (Sims & Sims, 1986). Therefore, recognizing and attending to debilitating symptoms and also preventing the occurrence of illness or accident have become an increasing concern for individuals. Financial, enhanced physical, and emotional well-being are the rewards to those individuals who remain free of disease or disability.

Diabetes is one of several diseases in which clients and family members have an increased responsibility for health care independent of direct medical supervision. Diabetics are encouraged to manage their illness; however, to acquire and maintain control of diabetes, the appropriate behavior changes and competence must be developed.

Individuals with diabetes usually find it upsetting to learn and be reminded frequently that they have a serious

condition that will not go away. The prospect of complications is viewed as bleak. Diabetes may hinder the development or maintenance of autonomy, increase vulnerability to pessimism, discomfort, and disability, and shorten life expectancies. In view of the fact that heredity plays a strong role in noninsulin-dependent diabetes mellitus (NIDDM), many diabetics have relatives who died after physical complications of diabetes: neuropathy, cataracts, heart disease, amputations, and strokes. What individuals who have a chronic medical condition such as diabetes think and how they feel about themselves and their relationships can influence the effectiveness of treatment (Holmes, 1986).

Diabetic individuals use a disproportionate share of community health resources either through hospitalization or specialist outpatient services. The NIDDM clients numerically represent a greater health problem than the insulin-dependent diabetes mellitus clients. The NIDDM clients are, but need not be, frequent users of hospital resources. Better control of diet and weight by NIDDM patients would decrease their need for costly professional services. Intervention programs which might increase the quality of self-care by these patients would therefore be beneficial (Scott, Beaven, & Stafford, 1984).

Innovative ideas for providing patient education need to be developed and explored for effectiveness and for relationship to behavior change. This study was designed to investigate the effect of a diabetes education program on social support, diabetes knowledge level, blood glucose level, and weight of noninsulin-dependent diabetics.

Conceptual Framework

Diabetes education program, diabetes knowledge level, social support, and environment are components of the Rodriguez Health Promotion Model (Figure 1), a conceptual model of nursing. The components represent the sources of relationships that influence and determine the health-promoting behaviors of the client. The Rodriguez Health Promotion Model was used as the conceptual framework for this study.

There is presently no cure for either type of diabetes. Individuals who live with diabetes need lifelong access to current education programs that are focused on behavior changes directly related to prevention of disease and promotion of health. Promotion of health is defined as elements that assist the person to maintain health (Murray & Zentner, 1985a). Behavior change for the diabetic client is focused on diet, exercise, and weight control. Pender (1987) described behavior change as centering on the

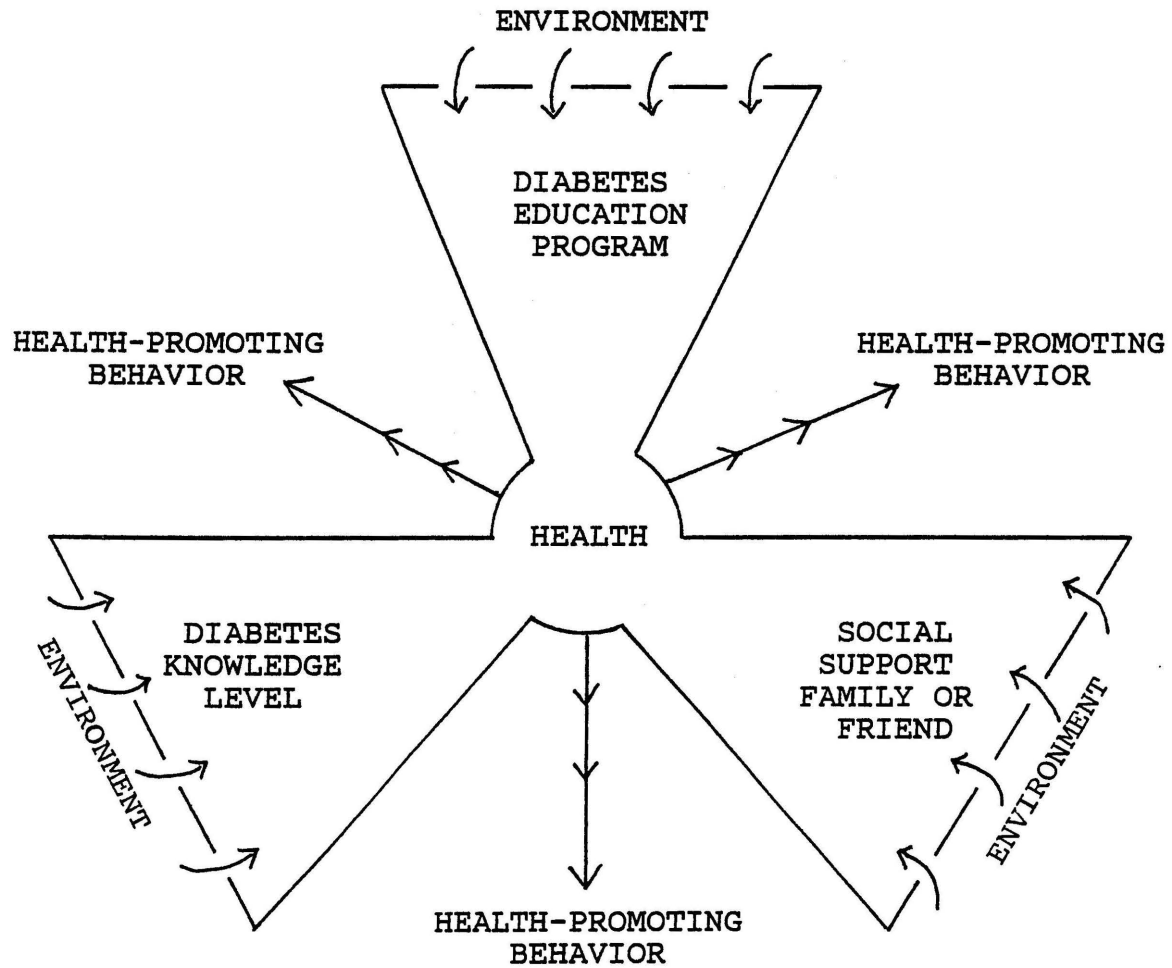


Figure 1. Rodriguez Health Promotion Model

biologic, psychologic, sociologic, and ecologic dimensions of human life. The intrinsic characteristics of individuals as well as the nature of social groups and the physical environment in which they reside must be considerations for change in behavior.

Fawcett (1989) described the four metaparadigms of nursing as person, environment, health, and nursing. These metaparadigms are defined in terms of the Rodriguez Health Promotion Model. Each of the four concepts correspond to a metaparadigm and are presented in three identical triangles in Figure 1. The model introduces the relationship between the concepts that may explain the occurrence of health-promoting behavior.

Person

According to Orem (1980), a person is the patient or client who received help and care from a nurse. Orem described person as one who, by functioning biologically, symbolically, and socially, can practice activities that maintain life, health, and well-being. Pender (1987) described person in terms of biopsychosocial behavior of human life. By engaging in health-promoting behaviors, the person can achieve higher levels of health. Both descriptions suggest that the person is instrumental in the implementation of health-promoting activities. The

distinguishing feature between the two interpretations is the person's ability to practice health-promoting activities. Orem indicated that the person can perform health-promoting activities based on human developmental processes and events that occur during the person's life cycle. Pender's description implies that the practice of health-promoting activities by the person is influenced by inner and outer environmental factors (i.e., self-efficacy, situational).

For this study, person is defined as a sociophysiologic, rationally functioning being who acts on self, others, and the environment. Person is conceptualized as the NIDDM client who received the diabetes education from the nurse and was guided to utilize the information to facilitate the implementation of health-promoting behaviors. The focus is the person's diabetes knowledge level which may facilitate the intervention for behavior change. By measuring a client's diabetes knowledge level, the possibility of the nurse's understanding and predicting health behaviors could be increased. According to Bandura (1977), learning can result on a vicarious basis by observing other people's behavior. The capacity to learn by observation enables the person to acquire extensive, integrated patterns of behavior without having to form them gradually by trial and error

(Bandura, 1977). The person is frequently of central importance in choosing, implementing, and managing a change in behavior. As pointed out by Tough (1982), most individuals are reasonably successful in achieving the behavior change they choose.

The Rodriguez model (Figure 1) demonstrates the basis for the development of health-promoting behaviors. Each concept, depicted in its respective triangle, plays a key role in the development process. Curved arrows pierce the broken baseline of each triangle to show the environmental influence on each concept. Each concept's characteristics (e.g., support from family or friend) are guided towards the center by arrows on either side of each triangle. The integration of the three concepts, depicted as a circle in the center of the model, is indicative of the development of health-promoting behaviors.

Environment

Orem (1980) described environmental conditions as the person's external surroundings which are being physical and psychosocial. Pender (1987) referred to the environment as the person acting in the environment instead of reacting to external influences or threats possibly posed by the environment. Orem interpreted environmental conditions as circumstances that motivate the person being helped to

establish appropriate goals and adjust behavior to achieve the goals. Pender's interpretation of environment includes available health-promoting alternatives that would increase the opportunity for the person to make responsible choices (i.e., no available low-calorie meals in restaurant).

In the Rodriguez Health Promotion Model, environment is defined as the external stimuli, objects, and people that impinge on the client and may facilitate the development of health-promoting behaviors. Availability of diabetes classes, transportation, caring personnel, and a willingness to change are environmental motivating factors. The client may be motivated to establish appropriate health-promoting options by participating in education-related activities. The client's perception of the environment is a major determinant of behavior. Therefore, manipulation of the environment (e.g., limit external threats) can be used for the promotion of health behaviors.

In the model (Figure 1), the environment is portrayed as a global, mobile formation of curved arrows encompassing and penetrating the permeable baseline of each triangle. An environmental influence included in the model as a major concept is social support. Social support is defined as information, knowledge, and/or advice that helps the individual to understand the environment and to adjust to

changes within it. Social support is conceptualized as a family member or friend whom the client feels can provide the support. In preparation for the anticipated support for the client, the supporter will receive the same diabetes information presented to the client. By providing accurate information and advice, the provider will help the client to understand the environment and adjust to its changes.

Health

Health is an active process in which individuals become aware of the state of well-being and then make the choice for a more healthy existence. The person assumes responsibility for health and is therefore responsible for its enhancement. Lifestyle and behavior can have a significant impact upon the individual's health status (Pender, 1987). The person may either enhance or detract from the well-being as a result of lifestyle choices made. Health behaviors, a result of responsible decisions, are influenced by the amount and type of health information the client has (Green, 1985). Although the acquisition of knowledge does not ensure adequate health, it is one important requisite. In the Rodriguez Health Promotion Model (Figure 1), health is conceptualized as the product from the union of diabetes education program, the diabetes knowledge level, the social support, and the environment. The acquisition of health

will be reinforced by (a) the support received from the family member or friend, (b) the nurse's supportive-educative endeavor, (c) the client's diabetes knowledge level, and (d) other environmental influences. The client has the option of utilizing the acquired knowledge to practice health-promoting behavior for a healthier existence.

Nursing

Nursing is the interaction between nurse and person to promote, maintain, and/or restore health. The nursing interaction is conceptualized as the provision of the diabetes education to the client by a nurse. The nurse's role is focused on decreasing the client's deficits in diabetes knowledge, skills, and motivation by providing the diabetes information with expertise and credibility and assisting the client to utilize resources to attain a higher level of wellness. The dissemination of the diabetes information is integrated in the Rodriguez Health Promotion Model (Figure 1) for the attainment of the behavior changes. Health-promoting behaviors usually cannot occur as a result of any one effort. Therefore, the model assumes that with the appropriate education, an adequate level of diabetes knowledge, a willingness to modify behavior, and the

appropriate support, the client can be motivated to practice health behaviors to promote, maintain, or restore health.

Assumptions

The following assumptions were basic to this study:

1. An individual has the potential to promote health (Orem, 1980).
2. Humans are social beings who develop their values, beliefs, attitudes, and behaviors through interaction within groups (Pender, 1987).
3. Individuals imitate behaviors throughout life (Pender, 1987).

Hypothesis

The hypothesis was designed to determine the difference between the control and experimental groups of this study with respect to social support, diabetes knowledge level, blood glucose level, and weight of noninsulin-dependent diabetics following a diabetes education program.

H_1 : The social support, diabetes knowledge level, blood glucose level, and weight of noninsulin-dependent diabetics will differ significantly among the control and two experimental groups after the experimental groups receive a diabetes education program.

Definitions of Terms

The following definitions of terms were accepted for use in this study:

1. Blood glucose level: physiologic measure that gauges the quantity of glucose in the blood (Lamb, 1984). For this study, blood glucose level was the quantity of glucose in the NIDDM client's blood as measured by the glycosylated hemoglobin (GHb) test.
2. Diabetes education program: a systematic process that informs, motivates, and helps people to attain and maintain healthful diabetic practices and lifestyles (Milazzo, 1980). For this study, formal diabetes education program was the information on nutrition, exercise, and general diabetes care presented by the nurse to NIDDM clients in hourly sessions once a week for 3 weeks (Appendix A).
3. Diabetes knowledge level: the fact or condition of knowing about diabetes with familiarity gained through experience or association (Sims & Sims, 1986; Webster's, 1982). For this study, diabetes knowledge was the level of knowledge the NIDDM client demonstrated as measured by scores on the Diabetes Questionnaire (Appendix B).

4. Noninsulin-dependent diabetes mellitus (NIDDM) client:
a person diagnosed with noninsulin-dependent diabetes mellitus by a physician.
5. Social support: formal or informal group relationships in which an individual receives cognitive, material, and emotional resources needed to master stressful experiences (Caplan, 1974). For this study, social support was the family member or friend selected by the NIDDM client, who attended the diabetes education program with the NIDDM client. Satisfaction with this support was measured using the Family APGAR Index (Smilkstein, Ashworth, & Montano, 1982; Appendix C).
6. Weight: the quantity of heaviness often specified as the amount that a thing weighs (Webster's, 1982). For this study, weight was how much the NIDDM client weighed in pounds and was the result of many behaviors.

Limitations of Study

The generalizability of this study was limited by the sample size and utilization of a convenience sample. Therefore, any conclusions and generalizations that are reached may be applicable only to the particular sample.

Summary

This study was designed to determine the effect of a diabetes education program on social support, diabetes knowledge level, blood glucose level, and weight in noninsulin-dependent diabetes mellitus (NIDDM) clients. The integration of these concepts was the focus for development of health-promoting behaviors (i.e., diet, exercise) by the NIDDM client. A formal diabetes education program was the primary intervention provided by the nurse for a 3-week period. The Rodriguez Health Promotion Model (Figure 1) served as the framework for the study. Assumptions of the model included the following: (a) individuals have the potential to promote health, (b) individuals are social beings who interact within groups to develop values, beliefs, attitudes, and behaviors, and (c) individuals are life-time imitators of behavior.

Diabetes knowledge and social support were measured by scores on a Diabetes Questionnaire and the Family APGAR Index. The NIDDM client's practice of diet and exercise were measured by weight and blood glucose levels. Blood glucose levels were gauged by the glycosylated hemoglobin (GHb) test.

CHAPTER 2

REVIEW OF LITERATURE

Published literature related to diabetes education, social support, diabetes knowledge level, blood glucose level, and weight is discussed in this chapter. The first section contains information on diabetes education, followed by a review of cost-effective diabetes education programs. The second section presents a review of diabetes education and social support. The third, fourth, and fifth sections encompass diabetes knowledge level, blood glucose level, and weight.

Diabetes Education

Diabetes education, a preventive health service, is an integral part of the overall program of care for the diabetic client. The overall purpose is to assist diabetics to achieve a life that is interesting, productive, and as pleasant as possible. Most clients wish to enjoy a daily sense of well-being, but well-being for the diabetic is dependent on maintaining the blood glucose level as close to normal as is feasible (Mazze, 1986). Educational interventions rely on the diabetics' attainment of new

information to increase the level of knowledge and foster behavioral changes (Mazzuca, 1982).

Outpatient education is accepted as an integral part of diabetes care. In 1986, the American Diabetes Association Task Force on Financing Quality Health Care for Persons with Diabetes reported that the American Diabetes Association, American Hospital Association, National Diabetes Advisory Board, American Public Health Association, and the American Association of Diabetes Educators acknowledged outpatient education as important and effective. Accordingly, the patient's right to be educated has been emphasized by consumer rights and has been enforced by Joint Commission for the Accreditation of Hospital Organizations standards, state's nurse practice acts, and the American Nurses' Association standards. Failure to meet this responsibility could result in a malpractice claim as was evident when a group of diabetic patients filed and won a lawsuit claiming they were not taught to manage their diabetes by nurses who cared for them (Honan, 1988; Smith, 1977).

The teaching function of the nurse is most crucial in chronic disease. Chronic disease includes all impairments or deviations from normal which are associated with one or more of the following characteristics: permanency of condition, residual disability, nonreversible pathologic

processes, or expected long period of supervision, observation, or care (Milazzo, 1980). Subsequently, the health focus has shifted from the treatment of acute disease to health maintenance and control of chronic disease which requires awareness and knowledge of the disease. Diabetes educators give people information about themselves, disease prevention, and health maintenance to hopefully exert a constructive influence that will foster lasting changes in their lifestyle. The change can involve an alteration or acquisition of new attitudes, capabilities (e.g., monitoring one's own blood glucose) or involve the modification of existing habits or acquisition of new ones such as decreasing the fat in the diet or undertaking a regular exercise program (Westberg & Jason, 1986).

Learning for the Type II diabetic begins when the individual becomes aware of the diagnosis. The person will need to be taught how to control the condition by making some specific changes in lifestyle (i.e., eating sensibly and exercising). Blood glucose monitoring and recognizing the adverse effects of oral hypoglycemics will need to be taught (Nath, Murray, & Ponte, 1988). Haire-Joshu (1988) noted that teaching interventions focused on cognitive knowledge elicit short-term behavior change. Short-term changes usually are easier to make than long-term changes.

For example, taking medications for one week is easier than for a lifetime or taking one's own blood pressure reading generally is far easier than acquiring a new attitude, such as "I will now begin taking care of my body" (Westberg & Jason, 1986).

Despite the established role of diabetes education, there is a need for a more effective approach. According to Honan, Krsnak, Peterson, and Torkelson (1988), the direct benefits of patient education include improved patient care, better patient compliance, and cost containment of health services. Kaplan and Davis (1986) suggested that education services should be based on improved health status rather than decreasing costs. The Texas Diabetes Council (1991) advocated prevention of complications, as a result of uncontrolled diabetes, based on cost per patient per year (e.g., blindness, \$37,000 per patient per year; kidney disease, \$20,000; amputations, \$20,000). Findings from an overwhelming majority of studies have reported cost-effective benefits deriving from diabetes outpatient education.

A 4-year integrated system of diabetes outpatient education and care in Los Angeles, California, resulted in a 73% reduction in hospitalization and a 78% reduction in average length of stay for 6,000 people with diabetes. An

estimated savings of \$2,319 per patient per year was reported (Miller, Goldstein, Kumar, & Dye, 1981). An intensive 6-year diabetes outpatient education and care program was implemented in a county hospital setting in Atlanta, Georgia. Using a team approach for evaluation, education, and therapy, diet treatment was emphasized for 12,950 diabetics of which 10,500 were treated, evaluated, or followed-up. The incidence of severe diabetic ketoacidosis was reduced by 65% and the number of lower-extremity and amputations by 49%. Estimated savings were \$437,500 per year (Davidson, 1983). A total of 212 diabetics participated in a 5-day intensive outpatient education program over three years. Within a 22-months' follow-up, days spent in the hospital fell from an average of 16.7 per year before the course to 6.3 days per year after the course and hospital admissions were reduced from 0.80 to 0.49 per patient per year (Assal et al., 1985; Muhlhauser et al., 1983).

The Centers for Disease Control sponsored a diabetes outpatient education program in six hospitals throughout the state of Rhode Island. Assessment at one year post-education resulted in 51% reduction in acute diabetes-related hospitalizations and a 63% decrease in hospital days per person per year (Alogna, 1985). The state of Maine,

with support from the Centers for Disease Control's Diabetes Control Project, implemented a trial of diabetes outpatient education consisting of five 2-hour group classes plus follow-up and counseling in more than 30 of its hospitals and health centers. There was a 32% reduction in hospital admissions of 1,488 patients over a 3-year period, with a savings of \$293 per participant (Zaremba & Wilhoite, 1985). A pilot study sponsored by Blue Cross of North Dakota was designed to follow 104 participants in the North Dakota Diabetes Education Centers program. There was a 72% reduction in hospitalization in the subsequent year. A 15-hour patient education program was followed by hospital evaluations during the subsequent year. After one year, there was a 19.5% reduction in hospitalization rate, compared to a predicted 13% increase. Including increased efficiency of subsequent outpatient visits, the net savings was \$143,356 (Jacobson, O'Rourke, & Wolf, 1983).

Social Support

Humans have been described as social animals who are more comfortable and productive living with companions than in isolation. Therefore, it is not surprising that productivity, morale, and satisfaction are all enhanced by positive affiliation with others (e.g., social support). The increased interest in the relationship of social support

to health has emerged over the past decade resulting in general agreement among researchers that individuals with greater amounts of social support enjoy better health than persons with less support (Berkman, 1986).

Social support has been linked to cardiac disease, pregnancy disorders, accidents, suicides, mental health, ulcers, and longevity, and the findings suggest that the nurturing effects of social support may be good preventive medicine. The critics on the beneficial effects of social support observed that although the general trend of the research is intriguing and mutually consistent, the research designs are weak. Positive findings are open to alternative interpretations due to other variables being confounded with measures of social support (Bruhn & Philips, 1984). A questionable interpretation is whether good health makes a person more likely to receive social support or whether social support creates good health. Literature on the effect of a diabetes education program on social support was limited to patient health outcomes in conjunction with diabetes education and social support. Consequently, the literature review on social support is relative to this concern.

Conceptual analyses of social support have produced numerous diverse definitions (Diamond & Jones, 1983;

Hubbard, Muhlenkamp, & Brown, 1984). Common points included social support as a multifaceted construct made up of the communication of positive effect, social integration or a sense of belonging, and principles of reciprocity. These points are based on who provides social support, its function, and the intimacy characteristics of the relationship. The relationship between social support and health has generally focused on having some direct, protective influence on the individual serve as a buffer for the effects of stressful life events or be related to positive health outcomes.

Bruhn and Philips (1984) enumerated the positive and negative functions of social support. Social support helps fulfill the need to belong through emotional or instrumental aid (i.e., money, services, information), modifies the effects of negative stress, and strengthens or restores hope or morale especially during illness. The ability to provide and receive social support enhances an individual's ability to learn to use these skills in other situations. Social support can have negative effects, but since it is composed of several factors, it can produce various combinations of effects at various times. Consequently, researchers agree that it may not be possible to identify effects of social support, including its interrelated social factors (i.e.,

social resources, social networks, support systems), as consistently positive or negative (Billings & Moos, 1981; Turner, 1981; Williams, Ware, & Donald, 1981).

Behavioral and health scientists are currently using social support to denote variously defined supportive interactions (Norbeck, 1981). The American Nurses' Association included social support networks, an example of personal and environmental determinants of wellness and health functioning in individuals and families, in the statement of Research Priorities for the 1980s. Norbeck introduced a model that would incorporate social support into nursing practice. In addition, the environment of the patient as an important factor in healing and in promoting optimal health and functioning has been a long tradition for nursing as well as an important concept in clinical nursing.

Social support must be effective to sustain the support person's own feelings of competence and control. Like all other behaviors, social support provided by the support person requires the reinforcement of knowing that the recipient has benefitted or that the help has been beneficial. People are more willing to provide social support when they feel competent. More improvement may be generated in the persons providing social support than in the recipients (Brickman et al., 1983).

Most research on social support has been focused on relationships among family members with Type I diabetes (Anderson & Auslander, 1980; Eastman, 1987; Waller, Chipman, & Hardy, 1986; White, Kolman, Wexler, Polin, & Winter, 1984). Fewer studies are available with respect to the impact of social support among adults with diabetes, and even less studies are relevant to diabetes education with social support. A possible reason for the lack of interest is the belief that family or social variables do not impact on the adult patient to the same extent as they do on the adolescent. The differential impact of the presence or absence of support systems has been compared, but there has been very little interest in how social support systems affect health behavior and outcome (Cox, Gonder-Frederick, Pohl, & Pennebaker, 1986). Steward noted that health care professionals should be particularly interested in social support because it affects health (Cohen & Wills, 1985), health behavior (Berkman, 1985), and use of health services (Birkel & Pepucci, 1983). However, a majority of professionals reported little or not coverage of lay support groups in their educational programs. They also rated their current knowledge of social support as fair or poor and requested further information on the topic.

Patient knowledge about illness and the consequences of nonadherence to a therapeutic regime has been correlated with increased tendencies towards self-care. Similarly, extensive patient education and social support from close family members and the physician have had a positive effect on patient adherence to therapeutic regimen. The quality of social support significantly affects a person's ability to cope with chronic illness. Additionally, morale and coherence can be strengthened through dyadic interactions between the client and individuals providing social support in educational settings that support purposive behaviors during treatment and recovery (Maida, 1985).

Diabetes education and peer support interventions were assessed as facilitators of weight loss and glycemic control in a community sample of 79 elderly persons with NIDDM (Wilson & Pratt, 1987). The 16-week program consisted of 60-minute sessions for each of the three groups. Different groups received education only, education and peer support, and no treatment. The authors noted that NIDDM is the most common type of diabetes, the majority of individuals with NIDDM are obese, and dietary modification, the treatment of choice for obese persons with NIDDM, is rarely effective.

The purposes of Wilson and Pratt's (1987) study were to determine whether supportive behavior could be elicited from

elderly peers in a diabetes education class and to determine the incremental effects on weight loss and blood glucose levels when social support was added to diabetes education. The results of the study indicated that peer support can be enhanced among elderly individuals attending diabetes education classes and is related to desired changes in health behavior. The group with the peer support experienced substantially greater weight loss and initial reduction in hemoglobin levels than the group with only education. The findings warranted additional investigations of peer support as an adjunct to diabetes education and other types of patient education. The investigators recommended that a group facilitator be included on the diabetes education team to increase the efficacy of diabetes education.

To determine what effect the provision of relevant information and support to spouses of myocardial infarction patients during the hospital period had during the early stages of their convalescence, 76 wives were studied by questionnaire 6 weeks after the hospitalization period (Thompson & Cordle, 1988). The investigators were primarily concerned with obtaining data with respect to emotional and physical problems and satisfaction with information and support. The majority of the wives felt they did not

receive sufficient information about myocardial infarction, had not had enough opportunity to ask the experts questions, and had received most of their support from relatives. To provide a closer liaison between hospital and community staff, a community health team was charged with arranging an interview with the patient and spouse within a week after discharge and developing a care plan for the whole family (Thompson & Cordle, 1988).

A randomized controlled evaluation of an educational program in adults with high psychosocial risk of morbidity was conducted by Blake et al. (1987). A sample of 123 users of three family practices was randomly assigned to an experimental or a control group. A nurse practitioner presented a 6-month educational program to the participants who demonstrated recent stressful life changes and weak social support.

Findings from Blake et al.'s (1987) study suggested that life changes or events disrupted psychosocial homeostasis that would create a need for coping and enhancing vulnerability to illness. Social supports were measured using an instrument that assessed intimacy, personal and community networks, satisfaction with relationships, appreciation and understanding, and tangible assistance. The educational intervention was expected to

improve social supports which in turn would lead to a reduction in morbidity. Immediately following completion of the educational program, the subjects in the experimental group demonstrated higher social supports than the subjects in the control group. There was no significant difference in social supports between the two groups during the second 6-month follow-up. Although overall improvement in social supports was not evident, those subjects who developed strong supports had a lower rate of restricted activity (i.e., hospital or bed disability days) than did those subjects who continued to have low supports. The results suggested that improvement in social supports had some intermediate effect on health status.

Blake et al. (1987) provided several possibilities to support the negative findings. The educational intervention may have been ineffective or may have affected illness behavior more than health status. The education program may have reduced the propensity of stressed individuals to restrict their visual activities in response to a health problem. The content of the program may have been biased by personal characteristics of the provider with respect to attitude, enthusiasm, and style. For example, people with psychosocial risk may be particularly responsive to favorable attention from a professional. To minimize this

effect, a placebo or sham experience can be provided for a control group. However, it was not provided in this study because this type of experience was hard to formulate and the sample size presented constraints. The authors suggested the effect of the education program in a population with a different demographic profile needs to be explored. The family practice setting may provide opportunities for further exploration of the effects of social environment on health.

The provision of emotional sustenance, information, and material aid by partner, family, and friends helps maintain well-being and prevent adverse stress and illness (Holmes, 1986). The individual's knowledge that a confidant is available may increase the desire and ability to practice proper management, promotion of well-being, and functioning. In addition, the frequency of crisis and hospitalization may diminish.

The diabetic person shares particular health and preventive concerns with a nondiabetic. Both should eat well-balanced, nutritious meals, exercise, achieve and maintain ideal body weight, and possibly increase their independence. Although the nondiabetic can deviate from maintaining any or all of these concerns, the diabetic must not. Ideally, to minimize fluctuations in blood glucose, a

diabetic should balance medication, meal plans, exercise, and the stress associated with the management of each. Glasgow and Toobert (1988) attempted to replicate earlier findings on family support with Type II diabetics instead of Type I, to extend the findings by placing the 127 participants in a larger social-environment context, and to investigate the relationship of social-environment measures to diabetes-regimen adherence and glycemic control. The week-long study resulted in underlining the importance of understanding interactions between adults with diabetes and their family members. The findings supported the hypothesis that consideration of other contextual variables (i.e., stress and satisfaction with medical care) would provide a better means to understand and predict diabetes self-care behaviors.

Patient education is usually focused on the patient, and if the patient is a child or an incompetent adult, the education is centered on the primary caretaker. Parent-child health practitioners have recognized the need to include family members in health care because the importance of keeping the family functioning as a unit during a health care crisis is the crux of many present nursing care standards. Foster (1988) reported that many clients demonstrated greater participation in their care when the

educational program included the family and significant others. A family and friends can be especially important when an illness will significantly alter a patient or family's lifestyle and when complex care will be given at home. Although relatives and friends are usually the most significant people to the client, identifying influential family members and friends and incorporating them into patient teaching and discharge planning are critical points to pursue. According to Boyd (1986), the presence of absence of social support (i.e., family friends) can affect the client's learning and health. Family and friend's attitudes, values, and knowledge can influence a client's learning by helping the patient rehearse what was taught, remember information, and aid in carrying out health recommendations.

Involvement of family members or friends in the treatment process facilitates structuring of social supports which, in turn, can reduce treatment costs and increase the availability of social support (Tobin, Reynolds, Holroyd, & Creer, 1986). Murray (1989) offered advice as a support person and wife of a diabetic to any person providing support to a diabetic family member or friend. Number one on her list of suggestions was that the support person get an education in diabetes (i.e., the disease, treatment,

care) and view this responsibility as an opportunity to better one's health habits. Attention to one's health may help increase the quality of life and perhaps even lengthen it.

The link between social support and various outcomes has been established; however, there is a need for consensus on the conceptual definition of social support and on its measurement, a composite of qualitative and quantitative aspects of social support, more focused questions and tighter designs to determine specific properties of individuals, situation types of support, and other variables that influence outcomes (Norbeck, 1981). Social support process functions in complex ways which result in empirical evidence that is far from conclusive. Specific aspects of supportive social relations responsible for the salubrious effects have not been identified. Consequently, areas for research have included the examination of specific types of socially supportive behaviors (i.e., emotional, instrumental), how specific types of support buffer the effects of a particular type of life events (i.e., bereavement and examination of the qualitative dimensions of social support) (Cohen et al., 1982; Krause, 1987). Whereas the need for social support varies widely across individuals, the study of social support should involve the assessment of whether

individuals perceive that their need for support has been satisfied (Henderson & Duncan-Jones, 1981).

The more integrated an individual is, the more assistance is received. Numerous factors (i.e., social status, age, sex) affect the ability to reciprocate social support. A person with a great deal of social resources may have learned to cope with problems in the presence of support because the support was obtained more easily. A person with minimal social resources may have had to learn to cope with little or no support because the means to obtain support was lacking (Bruhn & Philips, 1984).

Social support involves a sequence of steps. If a person perceives the need for support, the support must be available before it can be useful. An individual must be able to perceive a need for social support in others to reciprocate social support. If social support is perceived as needed and is available, the person must know the source of support and how to obtain it. The ability to obtain support is affected by personality and coping style of the person. The coping style, in turn, affects the degree and adequacy of the support obtained. Therefore, adequacy of support affects social, psychological, and physical functioning. In addition, individual perceptions of the need for social support to maintain usual level of function

differ. Lastly, experienced social support also can affect the ability to reciprocate support. Further research is needed to investigate whether social support is available to the individual and whether the individual perceives support to be adequate (Bruhn & Philips, 1984). Continuing exploration of the ways in which social support contributes to well-being may be a promising avenue of investigation with potential benefits for all ages.

Diabetes Knowledge Level

According to Korhonen et al. (1983), the outcome of an educational program is determined primarily by variables such as age, cultural and educational background, socioeconomic status, and health prior to education. A barrier to maintaining improvement is believed to be related to less than optimal outpatient supervision after the education intervention. Physicians who provide outpatient supervision should have all the necessary information to counsel the self-managing diabetic patient. Clients who are having problems with self-management even though they participated in educational programs may need continuing education in some specific area of treatment.

Geller and Butler (1981) studied 78 consecutive community hospital admissions for diabetic complications over a 1-year period. These investigators found that 27%

of the patients had a specific education deficit which was judged to be responsible for their hospitalization and an additional 20% of the patients had combined psychosocioeconomic deficits accounting for their admission. The complications of diabetes and premature mortality are not inevitable. Hospitalizations for uncontrolled diabetes can be reduced by modern therapies. Development of long-term complications can be alleviated by better management. However, people with diabetes must understand their disease and know how to perform optimal self-care.

Sprafka, Kurth, Crozier, Whipple, and Bishop (1988) developed a community-based diabetes education program in rural Minnesota to provide information according to the needs of the diabetic individual. Physician recommendations, standardized personal interviews, and baseline behavioral and physiologic measures were used to determine the patient's level of knowledge, attitude, and skills related to diabetes. Based on information obtained from the assessment, the nurse educator determined the most appropriate teaching/learning methods, areas to emphasize, and goals for the participant. The program was designed to last one year with patient progress measured at 3-month intervals using behavioral (e.g., dietary, glucose

monitoring compliance) and physiologic (e.g., glycosylated hemoglobin, weight) variables.

Of the 245 diabetic participants in Sprafka et al.'s (1988) study, 84 completed the entire education process. Preliminary results demonstrated improvements in dietary compliance among all diabetic participants and improvements in home glucose monitoring compliance among Type II diabetic participants only. Total glycosylated hemoglobin values decreased significantly from the baseline measures among Type II diabetics. A total of 69 Type II subjects (19 men and 50 women) had weight measured at each visit. Men were significantly heavier than the women at each visit. Women demonstrated a significant decrease in weight between the baseline and the second visit with no significant changes observed thereafter. Men did not demonstrate significant changes in weight. Although continued improvement was not demonstrated, the program may have helped patients achieve initial improvements. Results suggested that educational efforts were successful and that the program appeared to be a viable model for rural communities. The design did not include a control group, and the results do not have sufficient numbers to account for disease state or system factors. Nonetheless, the study was offered primarily

as an encouragement to others to design and conduct community-based diabetes education programs.

Mazzuca et al. (1986) conducted a randomized, controlled trial design, in part, to determine whether a systematic patient education program could affect patient knowledge, skills, self-care behavior, glucose homeostasis, and risk factors for diabetes complications for a prolonged period of time. Patients included in the 14-month study were predominantly elderly, black females with noninsulin-dependent diabetes mellitus of long duration. The program tested was a combination of didactic teaching methodologies (e.g., lecture, discussion, audiovisual presentation), skill exercises (e.g., demonstration, practice, feedback), and behavioral modification techniques (goal setting, contracting, regular follow-up). Patient education modestly improved the patients' metabolic control. The decrease in experimental patients' fasting blood glucose compared with the control group represented approximately one-fourth of the within-group standard deviation. This modest decrease could have been due in part to the control group patients with relatively worse metabolic control at baseline declining the reassessment. Additionally, all patients were chronically hyperglycemic and obese. Therefore, neither random variation nor statistical regression could have been

expected to force group means closer together. The authors concluded that systematic education can have a demonstrable, prolonged effect on patient self-care skills and behaviors and on intermediate indicators of glucose homeostasis and chronic vascular complications. The patients were to be followed for another year to determine the longevity of observed effects and to assess long-term effects on emergency room and hospital utilization.

Blood Glucose Level

Glycosylated or glycated hemoglobin (GHb) is an indirect long-term measures of glucose control, but it is not the basis for adjustment of insulin doses. Glycosylated hemoglobin is being used increasingly in the clinical management of diabetes because the level of GHb has been shown to provide a time-averaged blood glucose concentration during the previous 1- to 2-month period (Baynes et al., 1984). It is an improved measure of glycemic control relative to specific blood glucose measurements on a single occasion or indirect measurements such as glucose determinations. In the clinical setting, it minimizes the potential for errors, and in the research area, there is a wide usage. Reasonable clinical and epidemiologic studies of diabetes cannot be done with measurements of GHb. The most germane research use of GHb is to help address the difficult

questions relating level of glycemic control to formation of the various complications of diabetes (Pecararo, 1988). The normal ranges for Isolab's (1990) glycosylated hemoglobin assay is 4% to 8%. Diabetics in good control tend to keep the values in the 9%-12% range; uncontrolled diabetics have values above 12%.

The role of the glycosylated or glycated hemoglobin in the management of diabetes was the focus of a symposium sponsored by Case Western Research University School of Medicine in 1988. Self blood glucose monitoring became available in the 1970s. The management of patients with IDDM and, to a lesser extent, those patients with NIDDM was revolutionized because this monitoring allowed access to blood glucose data on a day-to-day basis and provided the opportunity to adjust therapy based on blood glucose determinations. Subsequently, methods for measuring glycated proteins, especially glycated hemoglobin, became available (Service, 1988).

The advantage of GHb to estimate the status of glycemic control in IDDM is superior reliability, while in NIDDM, it has the practical advantage that it obviates the necessity for the patient to be fasting for the blood sampling. Since the GHb is not easily manipulated by diet, deliberate short-term caloric restriction prior to measurement does not

affect the results. The disadvantages of GHb are the same for IDDM and NIDDM. The measurement is lab and method dependent with multiple potential causes for error. It is relatively more expensive and does not direct specific changes in therapy.

Several investigators (James, 1982; Javanovic & Peterson, 1980; Rubin, Peyrot, & Saudek, 1989) reported significant changes in diabetic clients' performance of recommended procedures (i.e., selection of types of food, self-care) after presentation of an education program. A week-long outpatient diabetes education program measured 165 adult participants' self-care patterns, blood glucose levels, and emotional well-being (Rubin et al., 1989). Subjects who entered the program with high levels of emotional well-being or good self-care behaviors or glycemic control tended to change little or none at later measurements. However, individual who entered the program with low levels of emotional well-being or with poor self-care behaviors or glycemic control improved substantially. However, the study did not represent a randomized controlled trial. The sample included a disproportionately large number of highly educated individuals and people who took insulin. Additionally, the results may have been dependent on the program's multidisciplinary staff and high

staff-to-patient ratio. Lack of a control group left the possibility that the substantial and long-term improvements reported may have been attributable to causes other than program effects.

A model teaching program (diabetes club) was established with a group of Type I diabetics who were members of a health maintenance organization (James, 1982). The program goal was to improve patient and family compliance with self-care and improve physician efficacy in the care of diabetic patients. Of the 18 subjects who entered the program, only 9 remained throughout the 2.5 years. The glycosylated hemoglobin was lower among the participants and tended to improve over time. A reduction in hospitalizations, 2 compared to 11, also was reported. This improvement might suggest a better understanding of their diabetes and acceptance of the need to attain tighter control. Several advantages of a group teaching approach were noted. The relaxed atmosphere of a group tended to bring out discussion of both major and trivial subjects relevant to diabetes (e.g., birthday parties for young diabetics). Another advantage was that the physician-coordinator was able to see most of the nine participants in 2 hours compared to 27 hours of physician time.

Javanovic and Peterson (1980) noted that improved glycemic control among 10 pregnant women with Type I diabetes was attributed to the patients' accuracy in measuring their own glucose levels, diet and exchange lists, and a method to titrate insulin based on blood glucose and insulin requirements of pregnancy. The clients learned self-monitoring skills that made possible near-normal glycemia with neither perinatal morbidity nor mortality.

A total of 1,471 individuals participated in a year-long public education and community screening program (Sutterer, Carey, Silver, & Nash, 1989). The participants were screened for blood pressure, fasting serum cholesterol, blood glucose level, and appearance of the serum. They completed a questionnaire regarding their knowledge of heart disease. The prediction that knowledge of risk factors would be positively associated with changes in risk or initial risk status was not supported by the findings. It was speculated that an individual's knowledge of risk might be associated with perceived susceptibility and risk status. This speculation was based on findings of Harris et al.'s (1987) study which indicated the frequency of dental care behavior was positively related to knowledge of dental care. The methodological problems cited by Sutterer et al. included less than 100% of the sample were retested which

possibly biased the results of the study. The follow-up data interpreted as changes observed reflected regression toward the mean, rather than self-initiated change. The instrument used to assess knowledge of risk factors had no known reliability and validity. The scale was developed for the program with only face validity. Therefore, error in variance in either variable measured is a possibility.

Korhonen et al. (1983) conducted a control study on the effects of intensive patient education on diabetic control in insulin-treated diabetic adults at the University Hospital of Kuopio in 1977-1980. The 77 subjects were randomized into one group that received intensive patient education and one group that did not. The intensive patient education was provided by a team of physicians, teaching nurses, and a dietitian individually and in small groups. The control group received a short instruction course consisting of printed material. Significant improvement in diabetic control was observed in both groups immediately after the education programs with gradual regression to the original level during the following 3-6 months. No difference was noted between the two groups in any of the measured parameters (i.e., urine tests, diet history, diabetes knowledge) during the 18-month investigation. Variables that affected good control during the study

included educational background, quality of control at the beginning of the study, degree of self-confidence, and lack of anxiety in the psychological tests. Results demonstrated that the efforts of educational programs are of limited value if they do not lead to permanent changes in attitudes and motivation, critical factors affecting long-term diabetic control.

Formal education was compared with self-monitoring blood glucose with respect to Metabolic control, as measured by glycosylated hemoglobin (HbA_1) during an 18-month period (Terent, Hagfall, & Cederholm, 1985). Of the 41 insulin-dependent diabetics, 37 were included in the study and were randomized into four groups. Ten patients received individual formal education followed by self-monitoring blood glucose (SMBG), 8 were instructed in SMBG without pre-education, 9 were given only formal education, and 10 made up a control group.

Terent et al. (1985) reported that knowledge about diabetes increased from 59% to 65% after education; however, education did not improve the mean HbA_1 values. The failure to improve metabolic control by intensified education, in spite of an increased level of knowledge, is supported by several other researchers (Karlander & Kindstedt, 1983; Korhonen et al., 1983). The introduction of SMGB resulted

in a decrease by 2% in HbA₁ (12% to 10%). However, the final HbA₁ level did not differ significantly between any of the groups. Terent et al. concluded that improved metabolic control, to a certain degree, was attributed to SMGB and not to education.

Karlander and Kindstedt (1983) and Korhonen et al. (1983) reported failure to improve metabolic control even though intensified education increased the level of knowledge. It is possible that the intensive attention the patients received during the studies (e.g., baseline interviews) may have influenced the control group irrespective of the type of intervention.

A controlled trial of the effects of physician and/or patient health outcomes (blood glucose level, blood pressure, A_{1c}Hgb) was conducted by Vinicor et al. (1987) over a 29-month period. During this period, internal medicine residents and their 532 diabetic patients were assigned to routine care, patient education, physician education, or both patient and physician education. The setting was a general medicine clinic in a metropolitan university medical center. Patient or physician education alone resulted in short-term improvements, but the greatest short-term improvements were observed in the patient and physician education group. While the study was not designed

to evaluate individual components of the educational activities, certain elements may have resulted in changes in patient and resident behaviors. The noted changes were based on several individual components. These components included the residents' and patients' health beliefs and attitudes, addressing common problems encountered by residents in their office practices (e.g., obesity), insuring adequate skills by residents and patients, and providing a supportive environment (e.g., contracts for patients). Despite intensive patient and physician education programs, ideal therapeutic goals were not achieved. Better results might have occurred if more attention had been given to clinical support systems in which physicians practice. In addition, according to Vinicor et al., difficulties health professionals and patients experience converting educational concepts into concrete daily actions may have contributed to persistent hyperglycemia and obesity.

According to Karlander and Kindstedt (1983), whether increased knowledge of diabetes mellitus and nutrition will improve diabetes control is still an open question. The recognition of patient education as an indispensable part of the treatment of diabetes mellitus is based on the idea that diabetics should assume responsibility for their own

management. The authors attempted to improve the previous study's results of patients in an outpatient clinic who demonstrated inadequate metabolic control (e.g., blood glucose, body weight, serum cholesterol) and generally low diabetes knowledge level. The program tested consisted of 5 days of lessons about diabetes, diet, and nutrition. The results of the study are based on 83 patients studied over a 12-month period; 17 were treated with diet alone, 24 with diet and antiglycemic medication, and 42 with diet and insulin. The 32 participants in the control group received only the knowledge test on diabetes, diet, and nutrition.

Karlander and Kindstedt (1983) noted that the experimental group's test scores improved after the educational program which indicated that most of the group had a better understanding of the material discussed during the lessons. The control group did not show any overall increase in test scores. At the 1-year follow-up, no general changes in diabetes control were evidence. Therefore, the authors concluded that the findings did not provide evidence that intensive patient education would result in improved diabetes control. They speculated that perhaps more extensive education might have increased the patients' knowledge to significantly influence their way of managing their disease and thereby would have yielded better

results. The authors also recommended that since adherence to therapy in diabetic patients is related to their beliefs about their disease, perhaps an ideal program should include analysis of patients' attitudes to their disease.

To assess the effectiveness of diabetes education (i.e., diabetes knowledge, anxiety, metabolic control), 60 noninsulin-dependent diabetic subjects were included in a 4-week educational program on an outpatient basis (Scott, Beaven, & Stafford, 1984). The 32 experimental group subjects received the educational program, and the 28 control group subjects received it 4 weeks later. Diabetes knowledge, anxiety, and metabolic control were assessed before and after the educational program by written questionnaires and glycosylated hemoglobin test. The participants showed reductions in HgA_{1c} , improvement in knowledge and less anxiety, but the control group did not show significant changes in measured indices of glucose control. However, improvements in glucose control were not sustained. Glucose levels measured 4 weeks after cessation of the educational program were not significantly different from those measured at the beginning of the program. Had the groups been more evenly matched with respect to blood sugar at the onset of the program, greater differences would have been expected.

Scott et al. (1984) concluded that individuals are more likely to respond with appropriate behavior modification when interventions are initiated as soon as possible after referral from the primary health care practitioners. However, since the subjects failed to sustain improvements in glycemic control after cessation of the educational intervention, the program was considered as ineffective in long-term behavioral modification. They concluded that the effectiveness of any education program must be carefully assessed, since the considerable time invested by health professionals may not result in substantial benefits.

Weight

Reduction of body weight, even a modest weight loss, has been emphasized as the most important dietary treatment for noninsulin-dependent diabetes mellitus. However, weight reduction is an extremely difficult prescription to follow. The recommended form of therapy for obese patients with Type II is weight loss because it improves glycemic control and insulin sensitivity and reduces atherosclerotic risk factors. Few diabetics are able to reach and maintain a desired body weight. Successful programs for weight reduction, long-term weight maintenance, and achievement of positive changes in eating behaviors include behavior modification, nutrition counseling, exercise, and group

support (Deshetler, 1991). Wing, Marcus, Epstein, and Salata (1987) discovered that their diabetic subjects lost less weight than their nondiabetic, obese spouses when they studied the six couples during a 20-week behavioral weight-control program. The program stressed behavior modification techniques such as self-monitoring and stimulus control. The subjects were asked to self-monitor their caloric intake and to stay below their caloric limit.

A monetary incentive was incorporated by Wing et al. (1987) in the exercise portion of the program. Each subject deposited \$75.00 at the beginning of the program and could earn it back in full for meeting weight loss, homework, and attendance contingencies. The authors concluded the diabetic patients were unsuccessful in losing more weight than their nondiabetic, obese spouses because the diabetic patients did not decrease their food intake as much as the nondiabetic subject.

Problems were cited by Wing et al. (1987): self-report measures of dietary intake were subject to errors of omission and distortion of portion size, therefore more careful verification of diaries is warranted. Although spouses can be excellent control subjects in some respects (i.e., same socioeconomic class, family environment), these spouses may have been motivated to lose weight either to

serve as a good example for the patient or to compete with the patient. Wing et al. recommended that the study should be replicated with other more neutral nondiabetic control groups. Perhaps more effective treatment programs can be developed when there is a better understanding of why Type II diabetic and nondiabetic obese individuals differ in weight loss.

Recently, high fiber diets have been advocated as helpful in the treatment of diabetes mellitus to decrease glucose, triglycerides, and cholesterol levels. Despite these benefits, many diabetologists hesitate to recommend diets high in fiber for their diabetic patients. A primary reason for the reluctance to recommend these diets is the suspected lack of palatability and compliance to the diet (Nuttal, 1983; Simpson et al., 1981). Crapo's (1983) nutritional update suggested that clients can adhere to dietary treatment if properly instructed in how to follow a diet that has been tailored to fit individual socioeconomic level, ethnicity, and lifestyle.

Stevens, Burgess, Kuser, and Sheppa (1985) investigated the impact of patient education on dietary fiber intake, diabetes control, and serum lipids on 52 noninsulin-dependent diabetics from an outpatient clinic over a 6-week period. The sample consisted of four groups that were

taught three diet plans: (1) the American Diabetes Association (ADA) diet, (2) the ADA diet modified to increase high fiber and carbohydrate foods (IF), and (3) the IF diet supplemented with oat bran (IFOB). A control group received foot care instruction instead of nutritional counseling. The participants taught to eat an increased amount of high fiber foods and given high-fiber supplements increased their reported fiber intake. The diet with increased fiber was tolerated well and increased fiber and carbohydrate and decreased dieting fat were related to decreases in fasting plasma glucose. Weight losses were too small for a significant association to be identified.

The success of outpatient dietary treatment of NIDDM is greatly dependent on the cooperation and compliance of the client. The benefits of weight loss and high-fiber and high carbohydrate diets in the treatment of diabetes may be demonstrated repeatedly, but their usefulness will remain limited unless the patients make the diet changes at home also. Although programs that involve intensive inpatient diet instruction and supervision are often helpful to the patients, they require a substantial commitment of time and resources from health care delivery organizations. Success in producing long-term weight reduction is generally poor even when large commitments are made.

Campbell et al. (1990) investigated the impact of an intensive educational approach to dietary change in NIDDM. The purpose of the investigation was to compare the effects of an intensive educational approach that incorporated longer time, greater simplicity, repetition, and cognitive motivational techniques with a conventional method in subjects with established NIDDM whose weight, glycemic control, and diet were not optimal. The aim of the intervention was to improve dietary patterns toward the goals currently recommended for improving glycemic control and lipid levels in NIDDM by the National Institutes of Health ("National Institutes of Health," 1987). It is agreed that diet is the foundation of management of NIDDM and that noncompliance with diet is accepted as a major cause for diabetic complications in long-term management of the overweight patient with suboptimal metabolic control (Campbell et al., 1990; Wing et al., 1987). Although weight loss was not a separate goal, it was expected to follow the regulation of food intake. The results indicated that the intensive educational approach achieved dietary change to recommended levels, but without better glycemic control. The temporary improvement in glycemic control noted in both groups might have been related in part to transient compliance with medication and regular meals. Campbell

et al. concluded that the significant decrease in cholesterol in the intensive group may be the major beneficial long-term effect of the diet change and would alone justify the increased cost of implementing an intensive program. The program would require 8.5 additional person-h/group than the traditional method which is ≈ 1 h extra person. Further testing was recommended to determine the relative value of the individual components (e.g., intensity of program, simplified teaching or cognitive approach) and the program's applicability to different groups.

Individuals with diabetes must learn to balance their meals and exercise requirements with insulin and/or oral antiglycemics. They must learn self-care techniques (e.g., blood glucose monitoring), treat insulin reactions, protect lower extremities that are numb and have seriously compromised circulation, and accommodate their regimen to changes in blood glucose due to stress or infections. Although these are complex tasks for many diabetics to learn, potential does seem to exist for anyone to learn how to prevent complications of disease (Green, 1985).

Summary

An obvious prerequisite to successful self-management is knowledge about diabetes and specific treatment skills.

However, diabetes education alone does not insure long-term control even though knowledge of diabetes and self-treatment skills may be necessary. Diabetes education may produce brief improvement that regresses over time. In some instances, clients may have been inadequately informed and may need to be assessed by the practitioner working with any aspect of diabetes treatment. Many clients demonstrate greater participation in their care when the family and friends are included in the educational scope. However, the knowledge of family members or friends relevant to the patients' treatment should be assessed and education interventions be implemented as needed. Although social support may be effective with some education programs, it may not be effective in all situations. Most patients with diabetes need small amounts of information given over long periods of time with continuous reinforcement. Although formal diabetes education has been proven effective in increasing the level of knowledge, it has been shown to be unrelated or inversely related to blood glucose level and weight reduction. While several studies have provided evidence of improved diabetes care (e.g., reduced hospitalizations) as a result of diabetes education, many more have indicated that the efficacy of diabetes education needs improvement.

CHAPTER 3

PROCEDURE FOR COLLECTION AND TREATMENT OF DATA

An applied research approach using an explanatory before-after experimental design was used for this study. The diagram for the data collection is depicted in Figure 2. According to Burns and Grove (1987), the experimental design is set up to provide the greatest amount of control possible in order to examine causality more closely. In this design, subjects are randomly assigned to groups and pretested on a measure of the dependent variable. The equality of the groups on the dependent variable is checked. The experimental manipulation is performed, after which the groups are again measured on the dependent variable. The difference between the groups is tested statistically. The design supplies a comparison control group against which the difference between groups can be checked.

In this study, three independent groups--two experimental and a control--were used. The three groups each consisted of 20 noninsulin-dependent diabetes mellitus (NIDDM) clients. The subjects were randomly assigned to either the experimental groups or the control group by use of a table of random numbers. The three groups were pretested on a measure of the dependent variables: social

Week 1	Weeks 2-4	Week 5	Week 10
Pretest	3-Week Diabetes Education Program	Posttest 1	Posttest 2
All Groups	Groups E+SS, E-SS ^a	All Groups	All Groups
Consent Forms Signed			
Weight		Weight	Weight
Blood Glucose		Blood Glucose	Blood Glucose
Social Support		Social Support	Social Support
Diabetes Knowledge		Diabetes Knowledge	Diabetes Knowledge
Demographic Data			

Figure 2. Flow Diagram for Data Collection

^aE+SS = Experimental with Social Support; E-SS = Experimental without Social Support

support, diabetes knowledge level, blood glucose level, and weight. A 3-week diabetes education program, which was the independent variable and the nursing intervention, was given to the two experimental groups. Only the clients in one experimental group had a family member or friend (social support) of their choice attend with them (Group E+SS). These clients and their social support received the 3-week

diabetes education program. The clients in the second experimental group did not have a family member or friend attend with them. These clients received the same 3-week diabetes education program (Group E-SS).

Social support, diabetes knowledge level, blood glucose level, and weight were measured a third time 5 weeks after the initial posttest. Differences between the control and the two experimental groups were tested statistically. Extraneous variables identified in the study included type of diabetic (i.e., I, II), client's reading and writing difficulties, and setting for the diabetes classes. Control was accomplished by including only Type II diabetics, also known as NIDDM, providing assistance to clients who had reading and writing difficulties (i.e., read questions to them), and providing a room equipped with appropriate teaching resources (i.e., furniture, lighting). Additional extraneous variables were gender, age, ethnic background, level of education, language spoken most often, length of time with diabetes, type of hypoglycemic agent used, previous diabetes education, and medical supervision. These variables were controlled through random assignment to groups.

Setting

The setting for this study was an outpatient health clinic located in a southern Texas city. The population of the city and surrounding area is approximately 10,000. The clinic, a full-service facility, offers its services to the general public; however, it serves a low-income and predominantly Hispanic population on an outpatient basis. The clinic is staffed with physicians, nurses, nutritionist, other health-care providers, and clerical aides. Clinic services are offered daily except for certain holidays. A large room with tables, chairs, and chalkboard was provided for the diabetes education classes.

Population and Sample

The population consisted of all the NIDDM clients who receive health services at the designated outpatient clinic. The population was comprised of a low-income and predominantly Hispanic clientele. The random sample consisted of subjects who were noninsulin-dependent diabetics and who consented to participate in the study.

Simple random assignment was used to designate the participants to either the experimental or control groups (Waltz, Strickland, & Lenz, 1984). All subjects in the population were prelisted. A list of numbers was drawn systematically by using a table of random numbers.

Assignment of the participants began with the first subject, and subsequent ones were chosen every fifth interval until 20 participants had been assigned to each group. Although larger sample sizes give greater power, 20 subjects in each group for this study ensured the power of the statistical test at .80, the level of significance at .05, and a moderate effect size between .30 and .40 (Cohen, 1977).

Each subject in the first experimental group, Group E+SS, was required to have a support person of their choice. If the subject did not meet this requirement, the name was placed at the end of the list. Random assignment was repeated until the requirement was met and the three groups had the specified number of participants.

Protection of Human Subjects

All of the current rules and regulations of the Human Subjects Review Committee of Texas Woman's University, as well as the requirements of the outpatient clinic, were followed after approval for the study by the Human Subjects Review Committee and permission to do the study by the clinic administrator were obtained (Appendix D). During the planning stages, the administrator and other designees met to coordinate the program. Informed consent was obtained by giving each potential subject a written explanation of the study that included the benefits (i.e., free blood glucose

tests) and possible discomforts (Appendix E). An offer to answer any questions was then made. Persons who agreed to participate were asked to sign the consent form. Confidentiality of data was maintained by the use of a coding procedure, and the list of subjects was available only to the investigator. The master code list was destroyed by the investigator at the end of the study.

Instruments

Instruments used in the study included a Demographic Data Sheet (Appendix F), Diabetes Questionnaire (Appendix B), and the Family APGAR Index (Appendix C), and a clinical scale. Blood glucose levels were measured by the GHb test. The data were used to explain the difference between the control and experimental groups with respect to social support, diabetes knowledge level, blood glucose level, and weight. A diabetes education program was the treatment presented to the two experimental groups, Group E+SS and Group E-SS (Appendix A).

Diabetes Questionnaire

Diabetes knowledge level is one independent variable measured by the Diabetes Questionnaire constructed by the investigator. This instrument was developed to provide specific information about the knowledge that

noninsulin-dependent diabetics have about diet, exercise, and general diabetic care (i.e., foot care). Previous information available on these topics is inadequate because the measures are too general or too advanced (American Diabetes Association [ADA], 1986; Forma & Van Son, 1985; McCray, Morgan, & Armbruster, 1988). Emphasis on diet and exercise is based on two facts: (a) obesity occurs in more than 80% of noninsulin-dependent diabetics and (b) no treatment will be effective without the proper diet and systematic exercise (Sims & Sims, 1986).

The instrument is a 50-item multiple choice questionnaire with structured close-ended statements and four alternative responses from which to choose the correct answer. This particular type of instrument was used because it was the most objective of the various cognitive measures, the most reliable, and has the greatest utility in measuring all types of knowledge (Waltz et al., 1984).

The instrument was designed to be completed by the participant. Completion of the test should take approximately 50 minutes. Instructions indicating how responses are to be marked are on the test. Since each item has only one correct answer, the score is based on the number of correct items. Each correct answer receives a weighted score of 2. The weighted scores of each correct item are

added to obtain a total score for each respondent. Possible scores can vary between 0 to 100, with higher scores indicating greater acquisition of the information presented.

The reliability of the instrument was estimated by using internal consistency after a group of 22 noninsulin-dependent diabetics were tested one time at a clinic that serves a predominantly low-income and Hispanic population. The item analysis procedure resulted in test reliability of $\alpha = 0.872$. The distribution of responses of this test was asymmetrical. Test scores varied from 7 to 42, with a range of 36, a test mean of 24.95, a variance of 85.75, and a standard deviation of 9.26. Following revision of the items, a repeated test of reliability using the 20 pilot study noninsulin-dependent diabetics resulted in $\alpha = 0.614$. Test scores of the revised instrument varied from 21 to 43, with a range of 23, a test mean of 33.30, a variance of 27.91, and a standard deviation of 5.28.

Item analysis was used to examine each of the test's items for their relevance to knowledge about diet, exercise, and general diabetic care. The questionnaire, blueprint, and content outline were presented to four educators to determine content validity. The item analysis procedures considered for this norm-referenced instrument were the item p level (item difficulty level), discrimination index, and

item response chart. A point biserial or biserial correlation between the score on each item and the score on the total test is included in an item analysis. The test items not consistent with the total are either revised or eliminated. The item difficulty levels varied between 0 and 1.00. The closer to zero, the more difficult the item. The closer to 1.00, the easier the item. According to Martuza (1975), the desirable item difficulty levels are between 0.30 and 0.70 because too easy or too hard items do not have the power to differentiate among the subjects. The item difficulty levels for this instrument varied between .000 and .857 with nine items falling in the too difficult category and five in the too easy category.

The discrimination index (D value) assesses the item's ability to predict the performance on the overall instrument. A value greater than +0.20 is desirable for norm-referenced measures. A positive D value indicates that those who score high on the test tend to respond correctly to the item and those who score low do not. A negative value means that the item discriminates against those in the upper level. This result may be due to a clue in the item to the lower scoring subjects or to the fact that the item is misinterpreted by the high scorers. If this result occurs, the item is faulty and needs improvement. This

instrument had 13 items that needed improvement. The D value varied between .000 and .744.

The item response chart, like the D value, assesses the item's discriminatory power. The computer printout specified the favorable and unfavorable items based on the discriminatory power. The instrument had items with indicators from A-E with A indicating excellence and E indicating unacceptable. There were five items in the E category, 10 in the D category, and 21 in the C category. The overall discrimination levels resulted in 15 items rated as fair, 5 as poor, and 1 as unacceptable. The questionnaire was revised and presented to the four educators who agreed on content validity.

Family APGAR Index

The Family APGAR Index was introduced by Smilkstein (1978) to measure a subject's satisfaction with five components of family function identified as Adaptation, Partnership, Growth, Affection, and Resolve. Adaptation refers to family resources available for coping. Partnership relates to problem sharing. Growth is acceptance of change. Affection means expression of affection and response to feelings. Resolve relates to time spent with family. Family refers to the person(s) with whom the subject usually lives. If the subject lives alone, family

refers to the person(s) with whom the subject has the strongest emotional ties (e.g., friend).

The self-administered questionnaire consists of five items. Each of the five items is scored on a 3-point scale: 0 = hardly ever, 1 = some of the time, and 2 = almost always. The total score may vary between 0 to 10 (low to high satisfaction with family function). The instrument was designed to be short, easy to score, and suitable for diverse family constellations in addition to traditional nuclear families.

According to Smilkstein, Ashworth, and Montano (1982), initial validation of the Family APGAR was accomplished by correlating it with a previously validated instrument, the Pless-Satterwhite Family Function Index, and with estimates of family function made by psychotherapists. The validation resulted in an APGAR/Pless-Satterwhite correlation of 0.80 and an APGAR/therapist estimate correlation of 0.64.

According to the authors, the correlation obtained indicated that the Family APGAR is a valid measure of family function and a useful instrument for clinical practice and research (Good, Smilkstein, Good, Shaffer, & Earnest, 1979).

Following the initial validation, the Family APGAR was administered to 527 college students in an introductory psychology course at the University of Washington. The mean

score was 8.1 with a standard deviation of 2.3. Reliability analysis resulted in a Cronbach alpha coefficient of .80. Internal consistency in assessing family function was considered adequate. To investigate the feasibility of a Friends APGAR, another sample of 297 college students was tested and results were correlated with the Family APGAR (Smilkstein et al., 1982). The average Family APGAR score was 7.35 (SD = 2.42), while the average Friends APGAR score was 7.95 (SD = 2.30), while yielded a statistically significant difference (correlated $t = 3.5$; $p \leq .01$). College students were predicted to express greater satisfaction with their friends than with their families. This finding supported the validity of the Friends APGAR. Data provided by an additional sample of 100 students were used to establish reliability of the instrument. A 2-week interval test-retest reliability was computed which resulted in $\alpha = 0.83$.

At present, studies are underway in which the Family APGAR is being used to correlate family function satisfaction with utilization of medical facilities, somatization, compliance, and the outcome of certain health problems. For this study, the effect of a diabetes education program on the knowledge level of the NIDDM client with and without family or friend (social support) was investigated. The instrument was used by diabetic clients, and a revised

version was used by the supporters. The NIDDM subjects and their family member or friend in Group E+SS were asked to respond to a question with respect to satisfaction in receiving and giving support before and after the diabetes education program.

The following question was asked of the NIDDM subject at pretest: You have been asked to have a family member or friend present during the diabetes education program to help you with your diabetes. How do you expect the family member or friend to help you with your diabetes? At posttest 1, the NIDDM subject was asked: You were asked to have a family member or friend present during the diabetes education program to help you with your diabetes. How did the family member or friend help you?

The following question was posed to the family member or friend at pretest: You were asked by your family member or friend to be present during the diabetes education program to help him/her with the diabetes. How do you expect to help your family member or friend with his/her diabetes? At posttest 1, the family member or friend was asked the following question: You were asked by your family member or friend to be present during the diabetes education program to help him/her with the diabetes. How did you help him/her?

Demographic Data Sheet

The demographic data were compiled to describe the sample and provide information about the relationship of these variables and health-promoting behavior. Demographic characteristics such as age, gender, and ethnicity may serve as modifying factors for health behavior. The characteristics of interest and rationale for their inclusion are provided. These characteristics are gender, age, ethnic background, level of education, language spoken most frequently, duration of disease, type of antiglycemic agent, previous diabetes education, and medical supervision.

Gender. Women are usually better informed about disease and less skeptical of the medical care system than are men. This fact may be due in part to women being responsible for family health. Consequently, women may learn more about disease and place more faith in physicians (Murray & Zentner, 1985b).

Age. As an individual matures, the need and capacity to self-direct, to use a reservoir of experience, and to organize the learning around life problems increases (Knowles, 1980). Experience is the adult learner's living textbook because what the person does is also learned.

Ethnic background. The importance of ethnic background cannot be too strongly stressed in planning for health education. Traditional cultural beliefs must be incorporated into health education. The key aim of health education is to change the behavior and lifestyle of clients to move toward a more positive and healthful direction (Pender, 1987).

Level of education. The ability to comprehend instruction varies with educational level. Health information must be presented at the individual's level of education (Pender, 1987). The requisite knowledge and skills must be present prior to behavior change.

Language. One of the most essential tools of the health-care provider is undoubtedly the ability to communicate. Language acts as a barrier to the full use of health services (Gonzales, 1978).

Duration of disease. The more a person is exposed to illness and medical care, the more likely the person is to have a scientific health orientation. This orientation leads, in turn, to becoming a more informed person (Murray & Zentner, 1985b).

Type of antiglycemic agent. Oral agents and insulin are used by NIDDM clients who cannot control their blood glucose levels and weight. A common misconception held by NIDDM clients is that oral agents are taken as a substitute for diet and exercise (Sims & Sims, 1986).

Previous diabetes education. Usually the diabetic with the longer duration of disease will demonstrate more interest in attending diabetes education classes. This diabetic generally will be in poorer control (Lindeman, 1985).

Medical supervision. Since women tend to be better informed about disease and are less skeptical of the medical care system, they will seek medical supervision more often than men (Murray & Zentner, 1985b).

Blood Glucose Levels

Blood glucose levels will be determined by glycosylated hemoglobin, a measurement which reflects, better than fasting blood glucose tests, the mean daily blood glucose concentration and the degree of carbohydrate imbalance over the preceding 4 to 8 weeks (Isolab, 1990; Nathan & Singer, 1984). The current methodology for measuring true, total hemoglobin uses microcolumns filled with a phenylboronic resin. The resin has a specific affinity for cis-diol and

glucose groups. If the glucose is attached to a protein (e.g., hemoglobin), the resin separates glycated from non-glycated molecules (Isolab, 1990). The clinic's protocol was followed by the investigator to collect the blood samples from the 60 NIDDM participants before and after the presentation of the 3-week diabetes education program followed by an additional collection approximately 5 weeks later. The glycosylated hemoglobin analysis was done by the same laboratory used by the clinic.

Weight

Weight readings were taken on a clinical scale by two designated assistants. Participants in both groups were weighed before and after the diabetes education program. An additional weight was taken approximately 5 weeks after the end of the educational program.

Reliability of the instrument was assured by having the scale calibrated by the clinic maintenance department before data collection began. Interrater reliability was established by having paired readings on volunteer subjects taken by the investigator and the two assistants. The measurement was taken at the same time. A total of nine paired measurements was collected, with three measurements taken by each of the investigating teams. The schedule is presented in Figure 3. Data were analyzed using the Pearson

product-moment correlation. The reliability coefficient for the weight was $r = 0.9$.

Subject	Nurse A	Nurse B	Nurse C
1	X	X	
2	X		X
3		X	X
4	X	X	
5	X		X
6		X	X
7	X	X	
8	X		X
9		X	X

Figure 3. Schedule of Paired Weight Measurements

Data Collection

The data were collected during a 10-week period. The first 5 weeks included a pretest and posttest followed by another posttest 5 weeks later. A convenience sample of noninsulin-dependent diabetics was randomly assigned to one of the experimental groups or the control group. All subjects in the population were prelisted. A list of numbers was systematically drawn by using a table of random numbers. Assignment of the subjects began with the first subject, and subsequent ones were chosen every fifth

interval until 20 participants had been assigned to each of the three groups. The written consent form of the study was given to each prospective client. Clients who agreed to participate were asked to sign the consent form before they were included in the study. Each participant was told when the study would begin.

The collection of blood samples, weight measurements, and answering the questionnaire were done during the first week. The 60 participants were divided in groups of 14 per day for the 5-day week. The support persons were seen with the respective NIDDM subjects. All questionnaires were marked with a coded number. Informed facilitators were available to assist the participants in completing the questionnaires. After completion of all pretesting procedures, the participants were thanked and given written return appointments. All participants in the experimental groups were reminded at least a day before to attend the diabetes education classes.

The diabetes education program (Appendix A) was presented to the 40 experimental subjects and their support persons in groups of 8 per day Monday through Friday during the 2nd through 4th week for one hour each session. The first class included an explanation of the diabetes education program (i.e., content, duration) and a 15-minute

video on nutrition by The University of Texas Health Science Center. Meal planning was discussed using food models from The University of Texas Health Science Center. The second class had a 10-minute video on foot care and exercise by The University of Texas Health Science Center, followed by discussion about hygiene, foot attire, and exercise (i.e., how, where, when to exercise). The third class consisted of information on general diabetes care such as sick day care, skin care, and signs and symptoms of hypoglycemia and hyperglycemia (ADA, 1989). Each class had a question and answer period at the end of the presentation. Each participant received a written return appointment. Both groups received the results of the HGB test and had the opportunity to ask any questions concerning these results. At the end of the educational program, the participants were given written return appointments for the posttest measures.

The participants in the control group were reminded to return on the 5th week for the posttesting. Written return appointments were given to each subject in the three groups on the 5th week for the second posttesting 5 weeks later. Several days prior to the second posttesting, each participant was reminded to return for the testing.

Pilot Study

Prior to the final research, a pilot study was conducted in a health clinic setting. A convenience sample of 20 participants was selected for a 5-week period. Using a lottery method, the first client was randomly assigned to either an experimental or control group, with subsequent clients being assigned in numerical sequence. Subjects in the experimental group were required to select a family member or friend whom they considered able to provide support. Information related to diabetes knowledge, locus of control, social support, blood glucose levels, and weights were collected over a 5-week period.

Several problems were identified during the data collection process. These problems included the following:

1. Day selected for classes. The majority of the clients could not meet twice a week because of transportation difficulties. The diabetics' clinic day was thought to be a better day to meet for at least 2 hours each session. Participants could attend the classes and be seen by the physician the same day.
2. Blood glucose measurements. Fasting blood glucose measurements, done by finger-stick, were routinely ordered for all diabetics. For the study, participants had blood drawn from the arm, and the Hemoglobin A₁C

test was used to measure the blood glucose. The large number of persons who needed blood drawn coupled with limited laboratory space resulted in delay in the blood collection. Although the participants were assured that fasting was not necessary for the Hemoglobin A₁C, most of the clients did not eat prior to the pretesting procedures and they complained of hunger.

3. Participant scheduled to see physician. The clients had the choice of attending the 2-hour diabetes class on an empty stomach, not attending the class and getting something to eat, or attending the class with demonstrative concern of not being seen by the physician if the nursing staff did not remember where to look for them.
4. Weight measurement. The use of the scale used to weigh the participants conflicted with another specialty clinic about which the investigator had not been informed. Delay and general confusion in weighing also caused temporary delay and confusion in the collection of blood samples.

The Family APGAR Index was revised to allow for evaluation of both the social support received by the client and the support provided by the supporting individual selected by the client. A t test for related samples was significant for social support which included family members

and friends. However, comparison between the person receiving the support and the person giving the support should provide a better indication of the effect support has on the diabetic client's health-promoting behavior. A revised version of the same five items on the Family APGAR Index was used to measure the satisfaction with support as perceived by the support person selected by the NIDDM client (Appendix C).

The demographic data sheet was revised for use in the final study. Occupation was deleted because the majority of the subjects were unemployed. This attribute would not be affected by the treatment variable. To make it easier to answer, English and Spanish were added to language spoken most in the home. The number of classes attended and approximately time span (i.e., months, years) the client attended diabetes classes added to the question related to previous teaching. The length of time the client has been under medical supervision was added to the question about medical supervision. For use in the final study, the days selected for the classes were diabetic clinic days; however, classes were scheduled to prevent interference with scheduled physician appointments. Evening classes were a consideration especially if supporting individuals were employed. Blood glucose measurement procedures were better

organized for smoother pretesting and posttesting. One calibrated scale was readily accessible for measurement of the participants' weight.

Treatment of Data

All data collected on the dependent variables were analyzed for measurements of central tendency, variability, and statistical inference. The alpha was set at $p \leq .05$.

Demographic Data Sheet

Measurements of central tendency and variability for the extraneous variables of the experimental groups and the control group included group means, standard deviation, percentages, and ranges. The variables were used to describe the sample.

Family APGAR Index

Although the APGAR tool is a summated scale, the resulting data were treated as interval level data. Measurements of central tendency and variability for pretest and posttest scores were tabulated by using analysis of variance (ANOVA). The t test for independent samples was used to analyze the difference between the person receiving the support and the person giving the support from pretest to posttest. A revised version of the Family APGAR Index was used to measure the support person's satisfaction with

their support to the NIDDM client. To assist in the evaluation of satisfaction with support between the NIDDM client and the support person, a qualitative question was asked of each subject in experimental group 1 (Group E+SS) before and after the diabetes education program.

Diabetes Questionnaire

Measurements of central tendency and variability for pretest and posttest knowledge scores of the Diabetes Questionnaire included group means and standard deviations. A one-way ANOVA with repeated measures was used. Alpha was set at $p \leq .05$. The t test for related samples was used to analyze the supporter groups' pretest and posttest scores on the Diabetes Questionnaire. Measurements of central tendency and variability included means and standard deviations. Alpha was set at $p \leq .05$.

Blood Glucose Level

Measurements of central tendency and variability for blood glucose level data included group means and standard deviations. To determine the location of a significant difference between and within the two groups, a one-way ANOVA for repeated measures was used.

Weight

Measurements of central tendency and variability for weight data included group means and standard deviations. Weight, a ratio-level measurement, was analyzed by a one-way ANOVA for repeated measures.

Summary

The setting for the study and the population and sample were described in this chapter. The instruments used in the study and the intervention, a diabetes education program, were discussed. A description of data collection procedures and the results of a pilot study were explained. Treatments used for data analysis finalized this chapter.

CHAPTER 4

ANALYSIS OF DATA

The effects of a diabetes education program on social support, diabetes knowledge level, blood glucose level, and weight of noninsulin-dependent diabetics (NIDDM) were investigated. In this chapter, the sample is described with respect to gender, age, ethnic background, level of education, language spoken most often, duration with disease, antiglycemic agent use, previous diabetes education, and medical supervision. The presentation of the findings is organized around each of the four dependent variables: social support, diabetes knowledge level, blood glucose level, and weight. The overall findings are then related to the hypothesis. Additional findings are also reported.

Description of Sample

The convenience sample in this study consisted of 60 NIDDM male and female subjects. Subjects were 27 years of age or older with a medical diagnosis of noninsulin-dependent diabetes mellitus. Subjects were randomly assigned to the education with a social support person present (E+SS) group, education with no social support present (E-SS) group, or control group. Each group

consisted of 20 subjects. The social support person was either a family member or a friend.

Gender

The majority (38; 63.3%) of the total sample was female (Table 1). The majorities (15; 75%) of both experimental groups were female; however, the majority (12; 60%) of the control group was male.

Age

The ages of all subjects varied from 27 to 79 years; the mean age of the total sample was 55.4 years. The youngest participant was in Group E+SS, and the oldest was in the control group (Table 1). The mean age of subjects in Group E+SS was 54.4 years (SD = 10.49), while Group E-SS had a mean age of 52.9 (SD = 10.46). The control group had a mean age of 59 years (SD = 10.17).

Ethnic Background

The sample consisted of 58 (96.6%) Hispanics, 1 (0.2%) Anglo, and 1 Afro-American (0.2%). Group E+SS contained the Anglo, and the control group contained the Afro-American.

Level of Education

The mean level of education for the sample was 8.4 years (SD = 1.48). Group E+SS had a mean level of education

Table 1

Frequencies and Percentages of Age and Gender of
Noninsulin-Dependent Diabetes Mellitus Subjects
by Group

Variable	<u>Group E+SS</u>		<u>Group E-SS</u>		<u>Control Group</u>		<u>Total</u>	
	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>
<u>Gender</u>								
Male	5	25.0	5	25.0	12	60.0	22	36.7
Female	<u>15</u>	<u>75.0</u>	<u>15</u>	<u>75.0</u>	<u>8</u>	<u>40.0</u>	<u>38</u>	<u>63.3</u>
Total	20	100.0	20	100.0	20	100.0	60	100.0
<u>Age (Years)</u>								
25-34	1	5.0	0	0.0	0	0.0	1	1.7
35-44	2	10.0	5	25.0	2	10.0	9	15.1
45-54	7	35.0	5	25.0	4	20.0	16	26.6
55-64	6	30.0	7	35.0	7	35.0	20	33.2
65-74	4	20.0	3	15.0	6	30.0	13	21.7
75-79	<u>0</u>	<u>0.0</u>	<u>0</u>	<u>0.0</u>	<u>1</u>	<u>5.0</u>	<u>1</u>	<u>1.7</u>
Total	20	100.0	20	100.0	20	100.0	60	100.0

of 8.2 years (SD = 1.43), and Group E-SS had a mean level of education of 8.5 years (SD = 1.57). The control group's mean level of education of 8.7 years (SD = 1.49).

Language

The language spoken most often by all three groups was Spanish. Only 4 (10%) subjects in group E+SS and only 2 (10%) subjects in Group E-SS reported speaking English most

often. Five (25%) control group subjects spoke English most often.

Duration with Disease

The mean duration with disease for the sample was 8.2 years (SD = 6.13). Group E+SS had a mean duration of 6.9 years (SD = 5.21), while Group E-SS had a mean duration of 8.3 years (SD = 6.37). The mean duration for the control group was 9.5 years (SD = 6.74).

Antiglycemic Agents

The sample can be characterized as predominantly nonusers of insulin (39; 65%). There were 51 (85.4%) previous users of insulin in the sample. Groups E+SS and E-SS had 6 (30%) insulin users and 2 (10%) previous users of insulin in each group. The control group had 8 (40%) insulin users and 2 (10%) previous insulin users.

Oral tablets were taken by 34 (56.7%) of the total subjects, 37 (61.1%) had taken tablets previously, and 23 (38.9%) had not used oral tablets previously. Group E+SS had 12 (60%) subjects on oral tablets, and 3 (15%) had used them in the past. Group E-SS had 14 (70%) on oral tablets, and only 1 (5%) had used oral tablets in the past. Eight (40%) subjects in the control group used oral tablets, and 7 (35%) used them in the past.

Of the total sample, one (1.7%) subject (Group E+SS) reported using insulin and oral tablets simultaneously. No antiglycemic agents were used by 7 (11.7%) of the total sample, 3 (15%) in Group E+SS and 4 (20%) in the control group.

Previous Diabetes Education

Of the 60 participants, only 12 (20%) had previous diabetes education. An average of 2.25 classes (SD = 1.42) were attended by the 12 subjects. Group E+SS contained 3 (15%) subjects with a mean of 2.3 classes (SD = 1.52), Group E-SS had 5 (25%) with a mean of 2.20 classes (SD = 1.6), and the control group had 4 (SD = 1.5). Previous attendance of diabetes education classes by the 12 subjects varied between 1 to 7 years with a mean of 4 years. The 4 individuals in the control group attended the classes 4 years ago. Group E+SS's 3 subjects' attendance varied between 1 and 5 years, and Group E-SS's 5 subjects' attendance varied between 1 and 7 years.

Medical Supervision

All 60 participants were under medical supervision. The average length of time under medical supervision was 8.12 years (SD = 5.87). Group E+SS had a mean of 6.6 years (SD = 4.9), Group E-SS had a mean of 8.18 years (SD = 6.02), and the control group had a mean of 9.67 years (SD = 6.48).

Findings

It was hypothesized that:

H₁: The social support, diabetes knowledge level, blood glucose level, and weight of noninsulin-dependent diabetics will differ significantly among the control and two experimental groups after the experimental groups receive a diabetes education program.

Data were collected on the four dependent variables of social support, diabetes knowledge level, blood glucose level, and weight. Means and standard deviations were obtained for each variable. A one-way ANOVA with repeated measures, a t test for related samples, and the Duncan Multiple Range post-hoc test were used to test the hypothesis.

Social Support

The Family APGAR Index, used to measure social support, was administered as the pretest, posttest 1, and posttest 2. The total number of participants at pretest was 60, with 20 in each group. The total number of participants at posttest 1 was 57 (95%) with 18 in Group E+SS, 19 in Group E-SS, and 20 in the control group. At posttest 2, there was a total of 46 (77%) subjects, with 15 in Group E+SS, 14 in Group E-SS, and 17 in the control group.

The pretest mean score for the total sample was 8.46, for posttest 1, it was 7.53, and for posttest 2, it was 7.79 (Table 2). The highest mean score (10.0) was obtained by the control group on the pretest, while the lowest mean score (6.36) was obtained by Group E-SS on posttest 1. The control group had the highest standard deviation (9.14) on pretest, and Group E+SS had the lowest standard deviation (1.77) on posttest 1.

Table 2

Means and Standard Deviations of Scores on the Family APGAR Index by Groups

Variable	<u>Group E+SS</u>		<u>Group E-SS</u>		<u>Control Group</u>		<u>Total</u>
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>
Pretest	7.75	2.65	7.65	2.13	10.00	9.14	8.46
Posttest 1	8.89	1.77	6.36	3.48	7.35	3.09	7.53
Posttest 2	7.67	3.22	7.35	2.87	8.35	2.20	7.79

The one-way ANOVA with repeated measures was used to test the scores of the Family APGAR Index (Table 3). With a calculated F of 1.16 ($df = 4, 86$), there was no significant difference between groups at $p \leq .05$. There was also no significant difference within groups ($F = 1.03, df = 4, 86$).

A t test for related samples was done to measure the difference between the NIDDM subject receiving the social

support and the family member or friend giving the support from pretest to posttest 2. With $t = 0.962$ ($df = 17$), there was no significant difference between the groups at $p \leq .05$.

Table 3

One-Way ANOVA with Repeated Measures of Scores on
Family APGAR Index

Sources	Sum of Squares	<u>df</u>	Mean Squares	<u>F</u>	<u>p</u>
Between Groups	61.829	4	15.457	1.16	0.33
Within Groups	27.308	2	13.654	1.03	0.36
Error	1,142.112	86	13.280		
Total	1,231.249	92			

In summary, there was no significant difference in posttest measurements of Family APGAR Index scores of subjects with a family member or friend present during the diabetes education program compared to subjects with no family member or friend present. There was also no significant difference in either the family member's, friend's, or NIDDM subject's satisfaction with social support from pretest to posttest 2. Therefore, the segment of H_1 dealing with social support was not supported.

Diabetes Knowledge Level

The means and standard deviations of diabetes knowledge level scores as measured by the Diabetes Questionnaire were compiled for the total sample (Table 4). The highest mean score for the total group was obtained on posttest 1 (66.35). Among the groups, Group E-SS reflected the highest mean score, 73.42 (SD = 13.55), on posttest 2, while the control group had the lowest mean score, 51.52 (SD = 20.63), which was also on posttest 2.

Table 4

Means and Standard Deviations of Scores on the
Diabetes Questionnaire by Groups

Variable	<u>Group E+SS</u>		<u>Group E-SS</u>		<u>Control Group</u>		<u>Total</u>
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>
Pretest	56.50	14.63	65.60	17.82	54.60	21.78	58.90
Posttest 1	72.33	10.45	69.26	17.61	58.20	16.70	66.35
Posttest 2	64.93	17.91	73.42	13.55	51.52	20.63	62.56

A one-way ANOVA with repeated measures was used to determine differences in the scores of the Diabetes Questionnaire (Table 5). With a calculated $F = 2.14$ ($df = 4, 86$), there was no significant difference between groups at $p \leq .05$. However, a significant difference was found within groups at $p \leq .04$ with a calculated F of 3.37

(df = 2, 86). The Duncan Multiple Range Test was done to locate the existing difference (Table 6). At a calculated value of 14.13 and a Duncan Critical Range of 12.54, a significant difference was found in Group E+SS after completion of the diabetes education program. A significant difference also was found in Group E-SS at posttest 2 with a calculated value of 21.90 and a critical range of 13.71.

Table 5

One-Way ANOVA with Repeated Measures of Scores on
Diabetes Knowledge Questionnaire

Sources	Sum of Squares	<u>df</u>	Mean Squares	<u>F</u>	<u>p</u>
Between Groups	1,243.181	4	310.795	2.14	0.08
Within Groups	976.485	2	488.242	3.37	0.03*
Error	12,473.281	86	13.280		
Total	14,692.947	92			

* $p \leq .05$

A t test for related samples was done to measure the diabetes knowledge level of the support person in Group E+SS from pretest to posttest 2. There was a significant difference in means with a calculated t of 5.03 (df = 17) at $p \leq .05$.

Table 6

Duncan Multiple Range Test for Mean Differences in Scores
on Diabetes Knowledge Questionnaire by Groups

Group	<u>Pretest</u>		<u>Posttest 1</u>		<u>Posttest 2</u>	
	<u>M</u>	Dif.	<u>M</u>	Dif.	<u>M</u>	Dif.
<u>Pretest</u>						
Control	54.60	11.00				
E-SS	65.60					
E-SS	65.60	9.10				
E+SS	56.60					
E+SS	56.60	1.90				
Control	54.60					
Duncan's Least Significant Range = 14.37						
<u>Posttest 1</u>						
Control			58.20	14.13*		
E+SS			72.33			
E+SS			72.33	3.11		
E-SS			69.22			
E-SS			69.22	11.02		
Control			58.20			
Duncan's Least Significant Range = 12.54						
<u>Posttest 2</u>						
Control					51.52	21.90*
E-SS					73.42	
E-SS					73.42	8.49
E+SS					64.93	
E+SS					64.93	13.41
Control					51.52	
Duncan's Least Significant Range = 13.71						

*Significant difference.

In summary, there was a significant difference in posttest measurements of diabetes knowledge level of participants who received the diabetes education program compared to the participants who did not. A significant difference was found in the family member's or friend's posttest measures of diabetes knowledge level after receiving the diabetes education program. Therefore, the segment of H_1 dealing with diabetes knowledge level was supported.

Blood Glucose Level

Means and standard deviations of blood glucose levels for all three groups were compiled (Table 7). The total sample pretest mean level was 10.15. For posttest 1, the mean level was 10.68, and for posttest 2, it was 9.56. The highest mean blood glucose level, 11.58 (SD = 3.35) was found in Group E-SS on posttest 1, while the lowest level, 7.83 (SD = 1.98) was found in Group E+SS on posttest 2.

Table 7

Means and Standard Deviations of Blood Glucose Levels
by Groups

Variable	<u>Group E+SS</u>		<u>Group E-SS</u>		<u>Control Group</u>		<u>Total</u>
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>
Pretest	9.25	2.91	11.06	3.42	10.13	3.03	10.15
Posttest 1	9.31	2.81	11.58	3.35	11.15	3.15	10.68
Posttest 2	7.83	1.98	9.90	3.08	10.95	3.15	9.56

A one-way ANOVA with repeated measures for blood glucose level measurements was completed (Table 8). With a calculated $F = 1.83$ ($df = 2, 86$), no significant difference existed between groups at $p \leq .05$. A significant difference was found within groups at $p \leq .001$ with a calculated $F = 7.08$ ($df = 2, 86$). Duncan's Multiple Range Test was done to locate where the difference existed (Table 9). With a calculated value of 3.12 and critical range of 2.15, a significant difference was found in Group E+SS at posttest 2.

Table 8
One-Way ANOVA with Repeated Measures of Blood
Glucose Levels

Sources	Sum of Squares	<u>df</u>	Mean Squares	<u>F</u>	<u>p</u>
Between Groups	9.459	4	2.364	1.83	0.13
Within Groups	18.326	2	9.163	7.08	0.001*
Error	111.338	86	1.294		
Total	14,692.947	92			

* $p \leq .001$

In summary, there was a significant difference in posttest measurements of blood glucose levels of subjects who received the diabetes education program compared to subjects who did not. Therefore, the segment of H_1 dealing with blood glucose level was supported.

Table 9

Duncan Multiple Range Test for Blood Glucose Levels
by Groups

Group	<u>Pretest</u>		<u>Posttest 1</u>		<u>Posttest 2</u>	
	<u>M</u>	Dif.	<u>M</u>	Dif.	<u>M</u>	Dif.
<u>Pretest</u>						
E+SS	9.25					
E-SS	11.06	1.81				
E-SS	11.06					
Control	10.13	0.93				
Control	10.13					
E+SS	9.25	0.88				
Duncan's Least Significant Range = 2.28						
<u>Posttest 1</u>						
E+SS			9.31			
E-SS			11.58	2.27		
E-SS			11.58			
Control			11.15	0.43		
Control			11.15			
E+SS			9.31	1.84		
Duncan's Least Significant Range = 2.32						
<u>Posttest 2</u>						
E+SS					7.83	
Control					10.95	3.12*
Control					10.95	
E-SS					9.90	1.05
E-SS					9.90	
E+SS					7.83	2.07
Duncan's Least Significant Range = 2.15						

*Significant difference.

Weight

Means and standard deviations of weights were obtained (Table 10). Group E+SS had two participants in wheelchairs with lower extremity bilateral amputations at pretest and one each at posttest 1 and posttest 2. No weights were obtained on these subjects. Thus, in this analysis for Group E+SS, there were 18 subjects at pretest, 17 at posttest 1, and 14 at posttest 2. The groups were uneven due to the missing data on the two subjects in wheelchairs. The highest mean, 183.30 (SD = 50.42), was for Group E+SS on the pretest. The lowest mean, 174.36 (SD = 34.06), was in Group E-SS on posttest 2.

Table 10

Means and Standard Deviations of Weight by Groups

Variable	<u>Group E+SS</u>		<u>Group E-SS</u>		<u>Control Group</u>		<u>Total</u>
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>
Pretest	183.3	50.4	178.5	34.8	176.8	31.6	179.5
Posttest 1	174.8	33.6	179.1	35.6	177.2	31.6	177.1
Posttest 2	175.9	27.1	174.4	34.1	181.1	29.2	177.1

A one-way ANOVA with repeated measures was done to determine differences in mean weights (Table 11). With a calculated $F = 0.10$ (df = 4, 84), there was no significant

differences between groups. There also was no significant difference within groups with a calculated $F = 0.10$ ($df = 4, 84$).

Table 11
One-Way ANOVA with Repeated Measures of Weight

Sources	Sum of Squares	<u>df</u>	Mean Squares	<u>F</u>	<u>p</u>
Between Groups	11.026	4	2.756	0.10	0.98
Within Groups	5.957	2	2.987	0.10	0.90
Error	2,404.540	84	28.625		
Total	2,421.523	90			

In summary, there was no significant difference in posttest measurements of weights of subjects who received the diabetes education program compared to subjects who did not. Thus, the segment of H_1 dealing with weight was not supported.

Additional Findings

Additional findings were obtained from data analysis of the NIDDM Group E+SS subjects' scores of the Family APGAR Index, used to measure social support. Pretest and posttest responses from this group ($N = 20$) with respect to satisfaction with receiving social support were summed (Appendix G,

Tables A & B). These responses were categorized as provision of social support in specific (S) ways (i.e., provide transportation, answer questions), nonspecific (NS) ways (i.e., encourage not to overeat), and negative (N) (i.e., little to no support) ways.

The frequencies of pretest responses by NIDDM Group E+SS subjects consisted of 14 specific, 5 nonspecific, and 1 negative response for a total of 20. Of these 20 responses, 4 indicated that the family member or friend would help them by providing the transportation and another 4 expected that the family member or friend would review the information presented in class with them. Three subjects said having the family member or friend present would help them learn more. Two subjects felt that social support would be provided to them by having their questions answered, while another 2 subjects indicated that the family member or friend would encourage them to follow their diet. The one subject who expressed the negative response expected little or no help from the family member or friend.

The frequencies of posttest responses by NIDDM Group E+SS subjects with respect to satisfaction with social support consisted of 12 specific, 5 nonspecific, and 1 negative for a total of 18. Three subjects said their family member or friend provided transportation. Another 3

said they were helped by having the information presented in class explained to them, while 3 others said having the family member or friend present helped them learn. Two subjects were encouraged by the family member or friend to practice what each had learned. The subject with the negative response expressed disappointment that the family member or friend did not facilitate the learning.

The pretest and posttest responses from the family members or friends of NIDDM Group E+SS subjects to satisfaction with social support also were summed (Appendix G, Tables C & D). These responses also were categorized as provision of social support in specific (S) ways (i.e., provide transportation, answer questions), nonspecific (NS) ways (i.e., encourage not to overeat), and negative (N) (i.e., little to no support) ways.

The frequencies of pretest responses from the NIDDM Group E+SS subjects' family member or friend with respect to satisfaction with social support consisted of 15 specific and 5 nonspecific responses. Four said they would provide transportation and help explain the information. Three said they would be present to encourage good eating habits. Two said they would make the NIDDM subject pay more attention to what is best for them. An additional two stated they would discuss the class information together. The remainder of

the subjects' family members or friends indicated they would help by explaining things they thought the subject did not understand, reminding them to attend class, preparing the proper food, listening, encouraging them to walk, or administering the insulin.

The frequencies of the posttest responses from NIDDM Group E+SS subjects' family member or friend with respect to satisfaction with social support consisted of 15 specific, 2 nonspecific, and 1 negative response. Two family members or friends said they provided transportation, while two others said they spent a lot of time together. One family member or friend expressed disappointment for not being able to help the diabetic family member or friend more than trying to explain things to the diabetic. The remainder of the responses consisted of reminding the subject to learn more or attend the classes, answering the subject's questions, listening to the subject, walking with the subject, encouraging the subject to follow the diet, or providing physical care.

Summary of Findings

The sample consisted of 22 male and 38 female NIDDM subjects with a mean age of 55.4 years. With the exception of one Anglo and one Afro-American, the subjects were Hispanic who spoke Spanish most often. The mean level of

education was 8.4 years. The mean duration with disease was 8.2 years. More than half (34; 56.77%) used oral anti-glycemic agents, while almost one fourth (14; 23.3%) used insulin. Only 12 (20%) had received previous diabetes education. All 60 subjects were under medical supervision for an average length of time of 8.12 years.

One-way ANOVAs with repeated measures were calculated for all data collected on the four dependent variables--social support, diabetes knowledge level, blood glucose level, and weight. Additionally, t tests for related samples were calculated for data collected on satisfaction with social support and diabetes knowledge level. There were no significant differences between groups on measurements of social support, diabetes knowledge level, blood glucose level, and weight. However, there were significant differences within groups on the measurements of diabetes knowledge level and blood glucose level, but no significant differences were found within groups on measures of social support or weight.

Duncan's Multiple Range Test was completed for diabetes knowledge levels. No significant differences were found within the groups at pretest. However, Group E+SS had a significant increase in scores from pretest to posttest 1.

Group E-SS also had a significant increase from pretest to posttest 2.

Duncan's Multiple Range Test was completed on mean differences of blood glucose level. No significant differences were found within the groups at pretest nor posttest 1. The significant difference in blood glucose level was in Group E+SS from pretest to posttest 2.

CHAPTER 5

SUMMARY OF THE STUDY

The purpose of this study was to explore the effect of a diabetes education program on social support, diabetes knowledge level, blood glucose level, and weight among noninsulin-dependent diabetes mellitus (NIDDM) subjects with and without a chosen family member or friend present during the diabetes education program. Subjects who received the diabetes program with or without a chosen family member or friend present were hypothesized to have significantly different scores on the Family APGAR Index and Diabetes Questionnaire as well as levels on the glycohemoglobin test and weight after completion of the diabetes education program than the subjects who did not receive the diabetes education program.

Summary

A three-group, before and after experimental design was used for this 10-week study with 60 NIDDM subjects. The 20 subjects in each group were randomly assigned to each group with a chosen family member or friend present for the diabetes education program in one of the experimental groups. Both experimental groups received a 3-week diabetes

education program. The experimental group receiving the diabetes education program with the family member or friend present was known as Group E+SS to designate the education with social support present. The second experimental group, who received the diabetes education program but had no family member or friend present, was known as Group E-SS to indicate education without family member or friend present.

Satisfaction with social support was measured by scores on the Family APGAR Index for all three groups. A revised version of the instrument was used to measure the family member or friend's satisfaction with social support. Diabetes knowledge level of the NIDDM subjects and the family member or friend was measured by scores on the Diabetes Questionnaire constructed by the investigator. To further explore the satisfaction with social support, Group E+SS and the family members or friends were asked to respond to a question before and after completion of the diabetes education program.

Blood glucose level was measured by the glycohemoglobin test (Isolab, 1990). Weight was measured with a clinical scale. The data collection diagram (Figure 2, p. 61) outlined the process used.

Data were summarized by measurements of central tendency and variability and analyzed by one-way analyses of

variance (ANOVAs) with repeated measures, t tests for independent samples, and t tests for related samples. No significant differences were found between groups on any of the variables measured. A significant difference was found in the diabetes knowledge level scores of Group E+SS from pretest to posttest 1 and Group E-SS from pretest to posttest 2. A significant difference in blood glucose levels was found in Group E-SS from pretest to posttest 2.

Discussion of Findings

Noninsulin-dependent diabetes mellitus (NIDDM) subjects who received the diabetes education program were hypothesized to have significantly different scores on the dependent variables when compared to those subjects who did not receive the diabetes education program. The findings are discussed as related to each dependent variable: social support, diabetes knowledge level, blood glucose level, and weight.

Social Support

The Family APGAR Index was used to measure satisfaction with social support for all subjects. A revised version of the instrument was used to measure the family member or friend's satisfaction with social support. Social support is measured with respect to adaptation (e.g., resources

available for coping), partnership (e.g., problem sharing), growth (e.g., acceptance of change), affection (e.g., expression of affection and response to feelings), and resolve (e.g., spending time together).

Although no significant difference in satisfaction with social support was found between or within the groups, the mean scores of the Family APGAR Index varied from 6.36 to 10.00. The total score varied from 0 to 10 (low to high satisfaction with social support). Therefore, the scores for the three groups indicated high satisfaction with social support, but not sufficiently high to be significant. The NIDDM subjects and their family member or friend, Group E+SS, also reported high satisfaction with social support, but also not sufficiently high to be significant.

There are several possibilities for the lack of significant difference in satisfaction with social support. Bruhn and Phillips (1984) noted that social support helps fulfill the need to belong, modifies the effects of negative stress, and strengthens or restores hope or morale. Perhaps the participants met all or some of these skills and felt comfortable with their task. The Family APGAR Index may not have been as easy to administer as the authors indicated. The NIDDM subject and family member or friend may have answered the questions differently if each one had been

assisted. The few who requested assistance did not readily understand the significance of the questions. Therefore, much time was spent explaining the 5-part instrument in Spanish. The participants who answered the questions without assistance may have given socially acceptable responses. Another possibility could be that social support among adults with diabetes (Type II diabetes) is not as common as relationships among family members with Type I diabetes (Anderson & Auslander, 1980; Waller, Chipman, & Hardy, 1986; White, Kolman, Wexler, Polin, & Winter, 1984). Stewart (1990) reported that a majority of professionals include little to no coverage of lay support groups in their educational programs and rate their current knowledge of social support as fair or poor. Therefore, it is not surprising that lay people, like the NIDDM subjects and the family member or friend, would not be proficient in providing or receiving social support.

The responses to the pretest and posttest questions with respect as to how the NIDDM subject expected the family member or friend to help, how the family member or friend expected to help the NIDDM subject, and how help was actually provided resulted in specific, nonspecific, and negative ways to help. The responses were similar in terms of specific method of helping. Both NIDDM subjects and

family member or friend were not given examples of social support skills. The responses were provided in individual bases.

The family member or friend apparently accepted the role of support person and indicated specific ways to help the NIDDM subject (Appendix G, Table C). The family member or friend's responses became more specific than the NIDDM subjects' at posttest (Appendix G, Table D). The diabetes education program was expected to have some effect on social support (e.g., family member or friend). The significant difference in the family member or friend's diabetes knowledge level mean scores from pretest to posttest 2 not only supported the hypothesis, but the increase in knowledge may have sustained the family member or friend's own feelings of competence and control. Brickman et al. (1983) affirmed that individuals are more willing to provide social support when they feel competent. Hence, learning more about a particular topic also may enable the individual to apply the social support skills relative to the situation (i.e., accompany NIDDM individual in walking, help select proper foods). With additional diabetes education followed by continuing education, perhaps the family member or friend's own feelings of competence and control will increase. People are more willing to provide social support

when they feel competent and when they know the help has been beneficial (Brickman et al., 1983).

These questions helped to give credence to the Family APGAR Index. Norbeck (1981) recommended a composite of qualitative and quantitative aspects of social support, more focused questions, and tighter designs to determine specific properties of individuals, situation types of support that influence outcomes. This study had a small composite of the qualitative aspect of social support. The questions addressed the situation types of support; however, it was beyond the scope of this study to address the influential aspect other than to refer to the conceptual framework based on the Rodriguez Health Promotion Model (Figure 1, p. 8). Social support, in conjunction with diabetes knowledge level, diabetes education program, and health facilitate the use of health promoting behaviors by the subject.

Diabetes Knowledge Level

The Diabetes Questionnaire was used to test diabetes knowledge level. Although there was no significant difference between the group means for diabetes knowledge level, the treatment by group interaction resulted in a borderline significant difference of $p = 0.08$. Attrition could have biased the results. Group E+SS and Group E-SS had less than 100% of the sample for posttests 1 and 2,

compared to the control's attrition (15%) at posttest 2. Sutterer, Carey, Silver and Nash (1989) cited the same methodological problem with their year-long public education and community screening program.

The significant difference in this study was located within groups at posttest 1 and posttest 2. At posttest 1, Group E+SS excelled, but at posttest 2, Group E-SS produced a much higher gain. Group E+SS had a borderline significant difference at posttest 2. While Group E-SS's mean scores increased, Group E+SS's mean scores decreased at posttest 2. A delayed educational reaction could possibly explain the difference between the mean scores.

Boyd (1986) noted that the presence or absence of social support can affect the client's learning and health. That presence or absence may be notable; however, inasmuch as family members or friends may be the most significant people to the NIDDM subject, they may not be the ideal persons to incorporate into patient teaching. Identifying influential family member or friend is difficult to pursue. The NIDDM subjects were asked to include a family member or friend whom they felt would be able to help them. A few of the subjects said they based their selection of the support person on availability and ability to provide transportation. Consequently, the friends and/or spouses who were

selected based on convenience (e.g., provide transportation) may have biased the results.

Contrarily, the family member or friend's improvement in diabetes knowledge level from pretest to posttest might suggest understanding of diabetes. Diabetes education programs generally have produced improvements in diabetes knowledge level (James, 1982; Javanovic & Peterson, 1980; Rubin, Peyrot, & Saudek, 1989; Wilson & Pratt, 1987). However, the improvement has been brief. Group E+SS's mean scores increased at posttest 2. According to Korhonen et al. (1983), a barrier to maintaining improvement is believed to be related to less than optimal outpatient supervision after the educational intervention. Those subjects who experience problems with self-management even though they participated in educational programs may need continuing education in a particular area of diabetic control.

Blood Glucose Level

A significant difference in blood glucose levels between the control and experimental groups was predicted. The significant difference in blood glucose level was located in Group E+SS at posttest 2. However, the results do not coincide with the diabetes knowledge level results with respect to the group. Group E+SS's mean scores for diabetes knowledge level were significant at posttest 1,

while Group E-SS's mean scores were significant at posttest 2.

The lapse of time between posttests 1 and 2 was 5 weeks. The means for blood glucose level for Group E+SS and E-SS improved from pretest to posttest 2. Scott, Beaven, and Stafford (1984) noted that improvements in glucose control of the 60 NIDDM subjects were not sustained. Blood glucose levels were measured 4 weeks after completion of the educational program. The program was considered ineffective in long-term behavioral modification. In this study, the diabetes education program played a decisive role in the improvement of blood glucose level. James (1980) noted that improvement (lower) of glycosylated hemoglobin among the participants might suggest a better understanding of their diabetes and acceptance of the need for tighter control.

Korhonen et al. (1983) reported significant improvement in diabetic control immediately following the education programs with gradual regression to the original level. Several researchers found that education did not improve the glycosylated hemoglobin values (Karlander & Kindstedt, 1983; Korhonen et al., 1983). In this study, the diabetes education program played a decisive role in improvement of blood glucose level.

Weight

The sample mean weight at pretest was 179.51, and at posttest 2 it was 177.14. There was no significant difference in weight between the control and both experimental groups. The two individuals with improved weight measurements were not sufficient to make a difference in the mean. However, it is noteworthy to mention the 10-pounds and 14.5-pounds loss. Only one subject had a decisive weight increase. Stevens, Burgess, Kuser, and Sheppa (1985) reported weight losses were too small for a significant difference to be identified when the effect of patient education on nutrition was investigated with NIDDM diabetics. Generally, the majority of NIDDM diabetics are obese, and weight reduction is extremely difficult for the NIDDM individual. The results of this study can attest to that statement.

Improved glycemic control for the NIDDM individual is contingent on weight loss. In some cases, oral agents or insulin have been discontinued as a result of weight reduction. Subsequently, dietary modification methods are tested continuously (Deshetler, 1991; Stevens et al., 1985; Wilson & Pratt, 1987; Wing, Marcus, Epstein, & Salata, 1987). Several possibilities were noted for the lack of weight loss. Wilson and Pratt recommended social support be

added to diabetes education classes. Matching NIDDM subjects to an appropriate program to achieve even modest long-term weight reduction was noted by Deshetler. Wing et al. and Stevens et al. cited lack of total cooperation and compliance of the clients. The clients did not make the diet changes at home also. The data collection for this study was done during the Christmas holiday season. Whereas the general population indulges in rich pastries and cookies, the Hispanic population tends to enjoy the foods common to its culture. These traditional foods include, but are not to, tamales, menudo, and bunuelos. The tamales are traditionally prepared with lard, pork, and/or beef. Needless to say, each tamale has an approximate caloric value of well over 200, and more than one tamale is usually eaten at any one time. One NIDDM subject responded to satisfaction with social support by stating that her family member or friend would help by allowing her to enjoy the traditional Christmas foods because it occurred only once a year. The interactions during the nutrition class indicated a willingness to try to eat sensibly; however, it was most likely difficult for many of them to practice what was learned.

Conclusions

Based on the findings of this study, several conclusions were drawn. The results of the Diabetes

Questionnaire and blood glucose level indicated that the NIDDM subjects had a better understanding of diabetes and accepted the need to attain tighter blood glucose control. For long-term effect, the diabetes education should be a continuing effort emphasizing the NIDDM subject's educational deficit. The Diabetes Questionnaire's categories could be graded individually to locate the deficit in the three categories of nutrition, exercise, and general care (e.g., foot, skin care). Additional education can then be implemented.

The results of the Family APGAR Index and weight indicated that the diabetes education program had no effect on social support and weight. Additional investigations with innovative ideas may have differing results.

Implications

Based on the findings of this study, implications can be made with respect to the NIDDM subject and the effect of a diabetes education program on social support (family member or friend), diabetes knowledge level, blood glucose level, and weight. The implications are applicable to the outpatient clinic nurse. The value of the Rodriguez Health Promotion Model is considered.

Findings from this study supported the effectiveness of a diabetes education program to produce better understanding

of diabetes and blood glucose control. However, the long-term nature of diabetes and the factors associated with the disease pose implications for the nurse. The nurse can (1) evaluate the present diabetes knowledge level of the NIDDM patient, (2) promote educational opportunities through group discussion, (3) be flexible and adapt teaching methods to learning needs, (4) reinforce what the NIDDM patient has already been taught; (5) develop and implement continued education sessions, (6) coordinate instruction with the dietitian and physician, (7) arrange classes and group discussions in conjunction with the NIDDM patient and family's time schedule, (8) utilize time spent waiting for the physician's arrival in individualized or group teaching, and (9) be alert for deficiencies in care.

The findings in this study concerning social support have indicated that the NIDDM subject and the family member or friend (social support) need to become more familiar with social support skills. The implications are to (1) include the family in every aspect of the NIDDM patient's medical regimen, (2) describe role expectations of the NIDDM patient and the family, (3) define problem situations of the NIDDM patient and family, and (4) include the family in instruction classes.

The findings in this study indicated that NIDDM subjects are obese and weight reduction is difficult to attain. The implications for the outpatient clinic nurse are to (1) include the family in the instruction classes, (2) be flexible and adapt teaching methods to learning needs, (3) identify problems situations with the NIDDM patient's effort to lose weight, (4) coordinate nutritional instruction with periodic visits to the NIDDM patient's home, (5) coordinate nutritional instruction with the dietitian, and (6) provide praise for the least amount of weight reduction.

The Rodriguez Health Promotion Model can be utilized more effectively if the implications presented are met. However, the model added support to health teaching as a basic nursing intervention for diabetic patients.

Recommendations for Further Study

The results of this study indicate that the study should be repeated to address questions with respect to the Diabetes Questionnaire, Family APGAR Index, and weight. The following recommendations are made:

1. Replication of this study should include a revised Diabetes Questionnaire to include traditional Hispanic foods (i.e., carne quisada, fideo, enchiladas) and in

addition to the total score, each category (e.g., nutrition, exercise) also should be scored.

2. Replication of the study should include additional criteria for the NIDDM subjects' selection of family member or friend to facilitate the study of social support. The NIDDM subject should be instructed to select a family member or friend who is familiar with the NIDDM subject's likes and dislikes, expresses a desire to learn more about the disease, and interacts well with the NIDDM subject. In addition, examples of social support skills may include (1) helping in the selection and preparation of food at home or outside the home (i.e., restaurants, social functions), (2) discussing and sharing problems, and (3) accompanying to social events and medical or dental appointments.
3. Replication of the study should include a minimum of 5 weeks of diabetes education to allow for review and discussion of material presented.
4. Replication of the study should include nutrition counseling with at least two follow-up visits to the subjects' home to reinforce the nutritional requirements and assist in resolving existing problems with the diabetic diet.

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APPENDIX A
DIABETES EDUCATION PROGRAM

DIABETES EDUCATION PROGRAM

I. Session I

- A. Greetings
- B. Explanation of educational program
 - 1. Content
 - 2. Duration
 - 3. Questionnaires
- C. Video about nutrition (15 min.)
- D. Discussion of video (University of Texas Health Science Center)
 - 1. Example of balanced diet
 - 2. Meal planning with food models (University of Texas HSC)
 - 3. Benefits of balanced diet
 - a. weight control
 - b. glucose level control
- E. Question and answer
- F. Written return appointment

II. Session II

- A. Greetings and introduction of video on foot care
- B. Video about foot care and exercise (15 min.)
- C. Discussion of video (University of Texas Health Science Center)
 - 1. Hygiene
 - 2. Care of toenails
 - 3. Foot attire
 - 4. Methods of exercise
 - 5. Benefits of exercise
 - a. Weight control

b. Glucose level control

6. Medical approval

D. Question and answer

E. Return appointment

III. Session III

A. Greetings and introduction of general diabetes care

B. General diabetes care (American Diabetes Association, 1989)

1. Sick day care

2. Skin care

3. Urine check

4. Signs and symptoms of hypoglycemia and hyperglycemia

C. Question and answer

D. Return appointment

APPENDIX B
DIABETES QUESTIONNAIRE

DIABETES QUESTIONNAIRE

You are being asked to answer the following statements about how you would manage your diabetes. Please read each one carefully. Choose the best answer and place a check () next to that answer. Thank you for your participation in this study.

1. As a diabetic you should control what you eat and how much you eat.

To do this, you should

- ☐A. Buy special diet food from a health food store.
- ☐B. Follow a diet recommended by a dietitian.
- ☐C. Follow any diet you choose.
- ☐D. Buy only low-calorie foods.

2. All of your meals should have a certain amount of carbohydrates (sugar), proteins, and fat. You should see more fat in

- ☐A. Peanut butter, butter, salad dressing.
- ☐B. Bread, Ritz crackers, honey crackers.
- ☐C. Skimmed milk, buttermilk, ice milk.
- ☐D. Lima beans, potatoes, peas.

3. An overweight diabetic should plan to lose weight. One way to do this would be by

- ☐A. Eating small amounts of any food.
- ☐B. Eating what a dietitian says to eat.
- ☐C. Eating what another diabetic says to eat.
- ☐D. Eating two meals a day.

4. Your neighbor has diabetes and asks you why his urine always tests positive for sugar. You can tell him

- ___A. He is probably not checking it right.
 - ___B. He is probably not following his diabetic diet.
 - ___C. He needs to drink more water.
 - ___D. He needs to eat more food that has protein.
5. A diabetic should know what to eat and how much to eat. To do this you can
- ___A. Keep a list of everything you eat during the day.
 - ___B. Use the list you use to buy groceries.
 - ___C. Keep only a list of what you for breakfast, lunch, and dinner.
 - ___D. Keep a list of all meats you eat.
6. To prepare a meal low in fat you should use
- ___A. Chicken, tomatoes, cottage cheese.
 - ___B. Turkey, baked potato, coleslaw.
 - ___C. Baked fish, avocado, cooked broccoli.
 - ___D. Roast beef, corn, mashed potatoes.
7. Your friend tells you that you should eat brown bread instead of white bread because brown bread has fewer calories. You should tell him
- ___A. Neither one is high in calories.
 - ___B. The brown bread has a lower number of calories.
 - ___C. Both breads have the same number of calories.
 - ___D. The white bread has a lower number of calories.
8. The best thing I should do to avoid getting tired of eating the same food is
- ___A. Have someone else cook the food for me.

- ___B. Use the food exchange diet plan.
 - ___C. Eat at restaurants as often as possible.
 - ___D. Use a different diet each month.
9. If you are invited to a church social where everyone is bringing food, the best thing you should do is
- ___A. Stay home because you are on a diet.
 - ___B. Eat whatever is served for that day only.
 - ___C. Pick foods and amounts that are in your diabetic diet.
 - ___D. Stay home and cook something extra special for yourself.
10. As a diabetic, you should eat
- ___A. Breakfast, lunch, and dinner plus your snack.
 - ___B. Lunch and dinner plus your snack.
 - ___C. Only when you are hungry.
 - ___D. Breakfast and lunch plus your snack.
11. You are at a fast-food restaurant, like McDonald's, for lunch. To eat the food that has less calories, you should choose
- ___A. Hamburger, fries, and a regular soft drink.
 - ___B. Cheeseburger, fries, and coffee with cream.
 - ___C. Hamburger, fries, and tea with lemon only.
 - ___D. Cheeseburger and a medium milkshake.
12. You know you must follow a diabetic diet. To make it easier to stick to your diet, you should
- ___A. Cook separate meals for and your family.
 - ___B. Encourage your family to eat what you eat.
 - ___C. Serve all family meals without desserts.
 - ___D. Eat at restaurants more often.

13. You weigh too much and decide to go on a diet. You should
- ☐A. Eat only two meals a day and not take as much insulin or diabetic pills.
 - ☐B. Cut down on the amount of food you eat and stop taking your insulin or diabetic pills.
 - ☐C. Ask the nurse to help you plan a diet.
 - ☐D. Eat the same amount of food and take more insulin or diabetic pills.
14. When diabetics receive their diet, they should
- ☐A. Follow the diet every day.
 - ☐B. Use the diet only when they start gaining weight.
 - ☐C. Follow the diet only when the blood sugar is very high.
 - ☐D. Use the diet every day except on holidays and special days.
15. Diabetics should shop for food
- ☐A. Only in stores that sell health foods.
 - ☐B. In stores where other diabetics shop.
 - ☐C. Where everybody else shops.
 - ☐D. Only in stores that sell diet foods.
16. To make a list of foods that are very high in sugar you must include
- ☐A. Apples, macaroni, milk.
 - ☐B. Honey, syrup, jelly.
 - ☐C. Grits, oatmeal, corn flakes.
 - ☐D. Bread, crackers, corn bread.
17. Mrs. Garcia has 2 crisp strips of bacon for breakfast. You should find bacon on

- ___A. The meat exchange list of your diabetic diet.
 - ___B. The fat exchange list of your diabetic diet.
 - ___C. None of the exchange lists because you should not eat it.
 - ___D. Both the meat and the fat exchange lists.
18. "Free foods" are those that you can eat in any amount because they contain less than 20 calories. You can choose
- ___A. Dill pickles, lettuce, radishes.
 - ___B. Cabbage, mushrooms, spinach.
 - ___C. Broccoli, cauliflower, carrots.
 - ___D. Corn, green beans, peas.
19. Diabetics like you can eat certain amounts of foods that have some sugar. You can choose the following that have some sugar
- ___A. Beans, cheese, liver.
 - ___B. Peanuts, pecans, avocado.
 - ___C. Fruits, potatoes, whole milk.
 - ___D. Puddings, vanilla cookies, sweet bread.
20. Your blood sugar will be affected by the amount and kind of food you eat. To control your blood sugar you should
- ___A. Take more medicine for diabetes with your food.
 - ___B. Follow your diabetic diet to balance your meals and snacks.
 - ___C. Eat only special diet foods.
 - ___D. Take less medicine for diabetes with your food.
21. Your diet includes proteins. You can choose the following because they have the most protein
- ___A. Eggs, peanut butter, liver.
 - ___B. Spinach, potatoes, white bread.

- ___C. Cheese, oranges, tomatoes.
 - ___D. Beans, cauliflower, broccoli.
22. Some form of exercise must be included in your daily life. The simplest way you can exercise is by
- ___A. Swimming.
 - ___B. Walking.
 - ___C. Jogging.
 - ___D. Hiking.
23. The main reason you, as a diabetic, should exercise regularly is because
- ___A. Exercise makes it much easier to lose weight.
 - ___B. Exercise helps your muscles get stronger.
 - ___C. Exercise helps me stay alert.
 - ___D. Exercise lifts my spirits.
24. Your friend has diabetes and is overweight. She asks you what she can do to lose weight. The best thing she should do is
- ___A. To eat only two meals a day.
 - ___B. To stick to her diet.
 - ___C. To follow her diet and exercise regularly.
 - ___D. To have some form of exercise every day.
25. To make it easier for me to stick to my exercise program I should
- ___A. Eat before I exercise so I don't get hungry.
 - ___B. Ask my family or a friend to join me.
 - ___C. Do only exercises that don't tire me too much.
 - ___D. Treat myself to some special food after exercise.
26. Many diabetics do not have to take insulin or diabetes pills to

control their blood sugar. To make this approach possible, diabetics must

- ☐A. Exercise regularly and follow their diets every day.
 - ☐B. Eat less every day.
 - ☐C. Exercise and diet only when their blood sugar is high.
 - ☐D. Eat many small meals every day.
27. As diabetics grow older, they may not be able to exercise as much as younger diabetics. The older diabetics should
- ☐A. Forget about exercising.
 - ☐B. Exercise only a little.
 - ☐C. Have exercise programs that meet their needs.
 - ☐D. Try to continue with the same exercises they used to do.
28. My concern is to control my blood sugar. If I exercise regularly,
- ☐A. Exercise will increase my blood sugar level.
 - ☐B. Exercise will lower my blood sugar level.
 - ☐C. Exercise will increase the sugar in the urine.
 - ☐D. Exercise will have no effect on my sugar level.
29. Before I try to exercise regularly I should
- ☐A. Cut down on my food.
 - ☐B. Eat more so I can be ready.
 - ☐C. Have a physical exam.
 - ☐D. Cut down on my insulin or diabetes pills.
30. When I exercise using my feet, I should
- ☐A. Make sure my feet are always clean.
 - ☐B. Exercise without any shoes.
 - ☐C. Use shoes that fit well.

- ___D. Wear extra socks on my feet.
- 31 I can have a good exercise program if I
- ___A. Sweep the house every day.
- ___B. Walk several blocks every day.
- ___C. Rake the yard once a week.
- ___D. Move around alot at home or at work.
32. If I don't know what exercises to do or how much I should do I can
- ___A. Get the information from magazines and books.
- ___B. Do the exercises that other diabetics do.
- ___C. Get the information from the doctor.
- ___D. Get the information from an exercise instructor.
33. The diabetics who do not like to exercise or are afraid to exercise should
- ___A. Omit exercise and not eat as much.
- ___B. Be told they still have to exercise.
- ___C. Include walking every day at a suitable speed.
- ___D. Omit exercise and take more insulin or diabetes pills.
34. Even when I may not feel like exercising, I should do it because
- ___A. I am supposed to do it.
- ___B. My body and my mind will feel better after I exercise.
- ___C. My doctor will get after me if I don't do it.
- ___D. Other diabetics exercise alot more than I do.
35. For exercise to help me the most I should exercise
- ___A. At least two hours after I eat.
- ___B. Anytime during the day or night.
- ___C. At least one hour before I eat.

- ___D. Only in the morning.
36. I know I must exercise regularly. If I am not feeling well, I should
- ___A. Exercise the full time.
- ___B. Exercise half the time.
- ___C. Not exercise and take care not to get sicker.
- ___D. Exercise twice as hard.
37. For exercise to help you burn up sugar and also help you lose weight, you should exercise
- ___A. Only when you feel like it.
- ___B. Every day for at least 20 minutes.
- ___C. At least once a week for an hour.
- ___D. Every day until you get tired.
38. Persons with diabetes should be able to exercise
- ___A. As much as any other person.
- ___B. Only a little.
- ___C. Only if they eat before exercising.
- ___D. Only if they take their insulin or diabetes pills before exercising.
39. Mr. Garcia is a diabetic bricklayer who works very hard all week. On the weekends he should
- ___A. Work just as hard at home.
- ___B. Rest to recover.
- ___C. Have some form of regular exercise.
- ___D. Take less insulin or diabetic pills because he isn't working very hard.

40. When I am thirsty and urinate (pass water) very often, I know that
- ___A. I should drink less water.
 - ___B. My blood sugar is low.
 - ___C. My blood sugar is very high.
 - ___D. This is normal for diabetics.
41. When diabetics use insulin or diabetes pills, they know that this medicine will
- ___A. Lower the blood sugar level.
 - ___B. Raise the blood sugar level.
 - ___C. Raise the sugar in the urine.
 - ___D. Keep the blood sugar at the same level.
42. If I can control my blood sugar with diet, exercise, and diabetes medicines, I should be able to prevent the most common diabetic problem with the
- ___A. Liver.
 - ___B. Lungs.
 - ___C. Eyes.
 - ___D. Feet.
43. A diabetic should routinely check the urine for sugar. He should do it usually
- ___A. Only in the morning.
 - ___B. Just before eating.
 - ___C. Anytime during the day.
 - ___D. Only at night.
44. Sugar in the urine means the blood sugar is high. If my urine is positive for sugar, I should test my urine

- ___A. At least twice a month.
 - ___B. Only once a week.
 - ___C. Several times each day.
 - ___D. Every other day.
45. If the sugar in my urine continues to be high, I should
- ___A. Look for the reason.
 - ___B. Ignore it.
 - ___C. Take more insulin or more diabetic pills.
 - ___D. Take less insulin or less diabetic pills.
46. If diabetics are sick, they should
- ___A. Not worry because their blood sugar is in good control.
 - ___B. Consider it important and call their doctor right away.
 - ___C. Stay in bed, rest for several days, and then call their doctor.
 - ___D. Not take their insulin or diabetes pills until they are well.
47. When giving insulin injections, you should
- ___A. Use the same part of the body each time.
 - ___B. Use only the legs.
 - ___C. Use a different part of the body every time.
 - ___D. Use only the arms.
48. While examining your feet you see a small cut on one foot. You should
- ___A. Use a cleanser like hydrogen peroxide.
 - ___B. Use a solution like iodine .
 - ___C. Soak your foot in hot water.

- ___D. Leave it alone.
49. Skin problems, like itching, are common in diabetics. If you had a problem with itching, you would
- ___A. Bathe more often.
- ___B. Bathe less and use mild lotions on your body.
- ___C. Change your clothes more often.
- ___D. Use a stronger bath soap.
50. To prevent ingrown toenails, I should
- ___A. Never cut my toenails.
- ___B. Cut my toenails just like my finger nails.
- ___C. Always cut my toenails straight across.
- ___D. Just keep my toenails clean.

CUESTIONARIO SOBRE LA DIABETES

Le pedimos que conteste las siguientes preguntas sobre como manejaría usted su diabetes en ciertas situaciones. Escoja la respuesta que mejor le agrada y marquela con una () enseguida de la respuesta. Gracias por participar en este estudio.

1. Una persona diabetica debe controlar lo que come y cuanto come.

Esto se puede hacer

- ☐A. Comprando comida especial de dieta en una tienda de nutricion.
- ☐B. Siguiendo la dieta recomendada por una dietista.
- ☐C. Siguiendo cualquier dieta que usted escoja.
- ☐D. Comprando solamente comida baja de calorías.

2. Todas sus comidas deben de contener cierta cantidad de carbohidratos (azucar), proteínas, y grasa. Usted sabe que las siguientes comidas contienen mas grasa

- ☐A. Crema de cacahuete, mantequilla, aderezo para ensaladas.
- ☐B. Pan, galletas Ritz, galletas de miel.
- ☐C. Leche descremada, nata, leche helada.
- ☐D. Habas, papas, chicharos.

3. Una persona diabetica que este sobrepesada de peso debe de planear como perder de peso. Una manera de hacer esto es

- ☐A. Comer cualquier cantidad pequena de comida.
- ☐B. Comer lo que un dietista recomienda.
- ☐C. Comer lo que otro diabetico recomienda.
- ☐D. Comer dos comidas al dia.

4. Su vecino tiene diabetes y le pregunta porque su orin siempre esta positivo al azucar. Usted debe decirle que
- ☐A. Probablemente no la este checando correctamente.
 - ☐B. Probablemente no este siguiendo la dieta para la diabetes.
 - ☐C. Necesita tomar mas agua.
 - ☐D. Necesita aumentar su consumo de proteinas.
5. Un diabetico debe saber que debe comer y la cantidad que debe comer. Para hacer esto un diabetico debe de
- ☐A. Llevar un record de todo lo que come en todo un dia.
 - ☐B. Usar la lista que usa para comprar la comida como guia.
 - ☐C. Llevar un record de lo que come en el desayuno, comida, y cena.
 - ☐D. Llevar un record de todas las carnes que se come en un dia.
6. Para preparar una comida baja en grasas usted debe de utilizar
- ☐A. Pollo, tomates, requeson.
 - ☐B. Pavo, papa cocida, ensalada de col.
 - ☐C. Pescado al omo, aguacate, broculi cocido.
 - ☐D. Carne rostisada, elote, papas molidas.
7. Su amigo le dice que debe de comer pan integral (color cafe) en lugar de pan blanco porque el pan integral contiene menos caloria. Usted debe decirle que
- ☐A. Ninguno de los dos es alto en calorias.
 - ☐B. El pan integral contiene menos calorias.
 - ☐C. Los dos tipos de pan contienen la misma cantidad de calorias.
 - ☐D. El pan blanco contiene menos calorias.

8. Lo mejor que debo hacer para no cansarme de comer la misma clase de comidas es
- ☐A. Tener a alguien que cocine para mi.
 - ☐B. Usar la lista de dieta para cambiar las comidas.
 - ☐C. Comer en un restaurante lo mas a menudo posible.
 - ☐D. Cambiar de dieta una vez al mes.
9. Si es usted invitada a un evento social a alguna iglesia donde todos llevan comida, lo mejor que usted puede hacer es
- ☐A. Quedarse en casa para no salirse de su dieta.
 - ☐B. Comer lo que le ofrezcan y seguir con la dieta mañana.
 - ☐C. Escoja comidas y cantidades que vayan de acuerdo con su dieta.
 - ☐D. Quedese en casa y prepare una comida especial para usted.
10. Como diabetico, usted debe de comer
- ☐A. Almuerzo, comida, cena y su bocado.
 - ☐B. Comida, cena, y su bocado.
 - ☐C. Solamente cuando tenga hambre.
 - ☐D. Almuerzo, comida, y su bocado.
11. Esta en un restaurante de comida rapida, como McDonald's, para comer. Para comer lo que contenga menos calorías, usted debe escoger
- ☐A. Hamburguesa, papas fritas, soda regular.
 - ☐B. Hamburguesa con queso, papas fritas, cafe encremado.
 - ☐C. Hamburguesa, papas fritas, te solamente con limon.
 - ☐D. Hamburguesa con queso, malteada mediana.
12. Usted sabe que debe de seguir una dieta diabetica. Para

- facilitarle las cosas, debe de
- ☐A. Cocinar por separado para usted y su familia.
 - ☐B. Recomendar a su familia que coma lo que usted come.
 - ☐C. Omitir los postres de sus comidas.
 - ☐D. Comer en restaurantes con mas frecuencia.
13. Usted pesa demasiado y desea seguir una dieta. Usted debe de
- ☐A. Comer solamente dos comidas al dia y disminuir la cantidad de insulina o pastillas para la diabetes.
 - ☐B. Disminuir la cantidad de comida que come y dejar de tomar la insulina o las pastillas para la diabetes.
 - ☐C. Decirle a la enfermera que le ayude a planear una dieta.
 - ☐D. Comer las mismas cantidades y aumentar la cantidad de insulina o pastillas para la diabetes.
14. Cuando los diabeticos reciben sus dietas deben de
- ☐A. Seguir la dieta todos los dias.
 - ☐B. Usar la dieta solamente cuando empieza a aumentar de peso.
 - ☐C. Seguir la dieta solamente cuando el azucar esta muy alto.
 - ☐D. Usar la dieta diaria con excepcion de dias de fiesta o dias especiales.
15. Diabeticos deben de comprar sus comidas
- ☐A. Solamente en tiendas de nutricion.
 - ☐B. En tiendas donde compren los diabeticos.
 - ☐C. En cualquier tienda.
 - ☐D. Solamente en tiendas que vendan comidas de dieta.
16. Para hacer una lista de comidas altas en azucar gura, usted debe de incluir

- ☐A. Manzanas, macarron, leche.
 - ☐B. Miel, melasas, mermelada.
 - ☐C. Maiz molido, avena, corn flakes.
 - ☐D. Pan, galletas, pan de maiz.
17. La señora Garcia tiene dos tiras de tocino para el desayuno. Usted puede encontrar el tocino en el grupo de comidas que contiene
- ☐A. Las carnes.
 - ☐B. Las grasas.
 - ☐C. En ninguna de las dos porque esto no se puede comer.
 - ☐D. En los dos grupos: las carnes y las grasas.
18. "Comidas gratis" son las comidas que se pueden comer en cualquier cantidad porque contienen menos de 20 calorías. Usted puede comer
- ☐A. Pepinillos, lechuga, rabanos.
 - ☐B. Repollo, champinones, espinacas.
 - ☐C. Brocoli, coliflor, zanahorias.
 - ☐D. Elote, ejote, chicharos.
19. Puede comer ciertas cantidades de comida que contengan poco carbohidratos (azucar) en ellas. Usted puede escoger
- ☐A. Frijoles, queso, higado.
 - ☐B. Cacahuates, nueces, aguacates.
 - ☐C. Fruta, papas, leche.
 - ☐D. Pudín, galletas de vainilla, pan dulce.
20. Su azucar en la sangre puede ser afectada por la cantidad y la clase de comida que usted come. Para controlar el azucar en la sangre debe de
- ☐A. Tomar mas medicamento con sus comidas.

- ☐B. Balancear sus comidas y sus bocados.
 - ☐C. Comer solamente comidas especiales de dieta.
 - ☐D. Tomar menos medicina con sus comidas.
21. Su dieta incluye proteínas. Usted puede escoger las siguientes porque contienen mas proteina
- ☐A. Huevos, crema de cacahuete, higado.
 - ☐B. Espinacas, papas, pan blanco.
 - ☐C. Queso, naranjas, tomates.
 - ☐D. Frijoles, coliflor, brocoli.
22. Alguna forma de ejercicio debe de ser incluido en su vida diaria. La forma mas sencilla que usted puede hacer ejercicio es
- ☐A. Nadando.
 - ☐B. Caminando.
 - ☐C. Corriendo.
 - ☐D. Dar paseos.
23. La razon por la cual debo de hacer ejercicio regularmente es
- ☐A. Haciendo ejercicio es mas facil para perder de peso.
 - ☐B. El ejercicio ayuda a mis musculos fortalecerse.
 - ☐C. El ejercicio me ayuda a mantenerme despierto.
 - ☐D. El ejercicio eleva mi espiritu.
24. Su amigo tiene diabetes y esta sobrepasado de peso. Le pregunta que puede hacer para perder de peso. Usted debe de decirle que
- ☐A. Necesita mantener su dieta.
 - ☐B. Necesita alguna forma de ejercicio diario.
 - ☐C. Necesita seguir su dieta y hacer ejercicio.
 - ☐D. Necesita dejar una comida al dia.

25. Para que se haga mas facil mantener mi programa de ejercicio debo de
- ☐A. Comer antes de hacer ejercicio para que no me de hambre.
 - ☐B. Pedirle a algun familiar o amigo que me acompañe.
 - ☐C. Hacer ejercicios que no me fatiguen mucho.
 - ☐D. Comer algo de mi antojo despues que termine de hacer ejercicio.
26. Muchos diabeticos no necesitan tomar insulina o pastillas de diabetes para controlar el azucar en la sangre. Para que esto sea posible los diabeticos deben de
- ☐A. Hacer ejercicio regularmente y seguir sus dietas.
 - ☐B. Comer menos todos los dias.
 - ☐C. Hacer ejercicio y seguir la dieta solamente cuando les suba el azucar.
 - ☐D. Comer pequenas cantidades de comida pero frecuentemente.
27. A medida que pasan los años por un diabetico, puede ser que no sea posible hacer tanto ejercicio como un diabetico mas joven. El diabetico mas anciano debe de
- ☐A. Olvidarse de hacer ejercicio.
 - ☐B. Hacer poco ejercicio.
 - ☐C. Tener un sistema de ejercicio apropiado para ellos.
 - ☐D. Tratar de seguir con los mismos ejercicios de siempre.
28. Mi interes es controlar mi nivel de azucar en la sangre. Si hago ejercicio regularmente
- ☐A. El ejercicio aumentara el nivel de mi azucar en la sangre.
 - ☐B. El ejercicio disminuira el nivel de mi azucar en la sangre.

- ☐C. El ejercicio aumentara el azucar en el orin.
 - ☐D. El ejercicio no tendra ningun efecto en mi nivel de azucar.
29. Antes de hacer ejercicio regularmente debo de
- ☐A. Dejar de comer.
 - ☐B. Comer mas para estar preparado.
 - ☐C. Tomar un examen fisico.
 - ☐D. Disminuir la cantidad de insulina o pastillas para la diabetes.
30. Cuando haga ejercicio utilizando mis pies, debo de
- ☐A. Estar seguro de que mis pies esten completamente limpios.
 - ☐B. Hacer ejercicio descalzo.
 - ☐C. Usar zapatos adecuados.
 - ☐D. Usar calcetines extra.
31. Puedo tener un buen programa de ejercicio si
- ☐A. Barro la casa diariamente.
 - ☐B. Camino alrededor de la cuadra diariamente.
 - ☐C. Rastrillo la yarda una vez por semana.
 - ☐D. Estoy constantemente activo en el trabajo y en la casa.
32. Si no se cuales ejercicios o cuanto tiempo hacer ejercicio debo de
- ☐A. Tomar la informacion de revistas o libros.
 - ☐B. Hacer el ejercicio que otros diabeticos hacen.
 - ☐C. Tomar la informacion de el medico.
 - ☐D. Tomar la informacion de un maestro de ejercicio.
33. Los diabeticos los cuales no les gusta hacer ejercicio o tienen miedo de hacer ejercicio deben de
- ☐A. Omitir ejercicio y reducir las cantidades de comida.

- ☐B. Exigirlos para que hagan ejercicios.
 - ☐C. Incluir el caminar a un paso normal.
 - ☐D. Omitir el ejercicio y aumentar la cantidad de insulina o de pastillas para la diabetes.
34. Aunque no tenga ganas de hacer ejercicio debo de hacerlo porque
- ☐A. Me supongo hacerlo.
 - ☐B. Despues de hacerlo me siento mejor fisica y mentalmente.
 - ☐C. El medico se enojara conmigo si no lo hago.
 - ☐D. Otros diabeticos hacen ejercicios mas que yo.
35. Para que el ejercicio me sea de mas provecho debo de
- ☐A. Hacer ejercicio despues de comer.
 - ☐B. Hacer ejercicio antes de comer.
 - ☐C. Hacer ejercicios a cualquier hora del dia o noche.
 - ☐D. Hacer ejercicios solamente por la mañana.
36. Debo de hacer ejercicio regularmente. Si no me siento bien, debo de
- ☐A. Hacer los ejercicios como siempre.
 - ☐B. Hacer la mitad de los ejericios.
 - ☐C. No hacer ejercicio y cuidarme para no enfermarme.
 - ☐D. Hacer doble la cantidad de ejercicios.
37. Para que el ejercicio le ayude a quemar el azucar y pender de peso, usted debe de
- ☐A. Hacer ejercicio solamente cuando tenga ganas.
 - ☐B. Hacer ejercicio todos los dias por 20 minutos.
 - ☐C. Hacer ejercicio diariamente hasta que se sienta cansado.
 - ☐D. Hacer ejercicio por lo menos una ves a la semana por una

hora.

38. Personas diabeticos deben de hacer ejercicio
- ☐A. Como cualquier otra persona.
 - ☐B. Hacer nadamas un poco de ejercicio.
 - ☐C. Solamente si toman insulina o pastillas antes de hacer ejercicio.
 - ☐D. Solamente si comen antes de hacer ejercicio.
39. El señor Jones es albanil, es diabetico, y trabaja duramente toda la semana. Los fines de semana el debe de
- ☐A. Descansar para recuperarse.
 - ☐B. Tener una forma de ejercicio regular.
 - ☐C. Tomar menos insulina o pastillas porque no trabaja tan duramente.
 - ☐D. Trabajar igual en la casa como lo hace en el trabajo.
40. Cuando tengo sed y orino seguido, debo de
- ☐A. Tomar menos agua.
 - ☐B. Pensar que el azucar en la sangre esta muy baja.
 - ☐C. Pensar que el azucar en la sangre esta muy alta.
 - ☐D. Pensar que esto es normal para los diabeticos.
41. Cuando los diabeticos usan insulina o pastillas para la diabetes, ellos deben de poder
- ☐A. Bajar su nivel de azucar en la sangre.
 - ☐B. Aumentar su nivel de azucar en la sangre.
 - ☐C. Aumentar su nivel de azucar en la orina.
 - ☐D. Mantener el azucar en la sangre al mismo nivel.
42. Si yo puedo controlar mi nivel de azucar con la dieta, ejercicio, y

medicina para la diabetes, debo de poder prevenir el problema mas comun de diabetes con

- ☐A. El higado.
- ☐B. Los pulmones.
- ☐C. Los ojos.
- ☐D. Los pies.

43. El diabetico debe de por rutina checar el orin para el azucar.

Debe de hacer esto usualmente

- ☐A. Solamente por la mañana.
- ☐B. Antes de las comidas.
- ☐C. A cualquier hora durante el día.
- ☐D. Solamente por la noche.

44. Azucar en mi orina significa que el nivel de azucar en mi sangre esta alta. Debo de checar mi orina

- ☐A. Por lo menos dos veces al mes.
- ☐B. Solamente una ves por semana.
- ☐C. Varias veces al dia.
- ☐D. Un dia si y un dia no.

45. Si el azucar en la sangre sigue alta, debo de

- ☐A. Buscar la razon.
- ☐B. Ignorarlo.
- ☐C. Tomar mas insulina o pastillas para la diabetes.
- ☐D. Tomar menos insulina o pastillas para la diabetes.

46. Si el diabetico esta enfermo, debe de

- ☐A. No preocuparse si su azucar esta controlada.
- ☐B. Considerarlo importante y llamar al medico a ese momento.

- ☐C. Quedarse en cama, descansar unos días y después llamar al médico.
 - ☐D. No tomar la insulina o las pastillas hasta cuando se alivie.
47. Cuando se inyecta insulina, usted debe de inyectarse en
- ☐A. En el mismo área.
 - ☐B. Solamente en las piernas.
 - ☐C. En diferentes áreas cada vez.
 - ☐D. Solamente en los brazos.
48. Examinándose los pies usted se da cuenta que tiene una pequeña cortada en un dedo. Usted debe de
- ☐A. Usar un limpiador tal como agua oxigenada.
 - ☐B. Usar una solución como yodo para prevenir la infección.
 - ☐C. Remojarse su pie en agua caliente.
 - ☐D. No hacerle nada.
49. Problemas de la piel tales como la comezón son muy comunes en los diabéticos. Cuando tenga esto, debe de
- ☐A. Banarse más seguido.
 - ☐B. Banarse menos y usar lociones suaves.
 - ☐C. Cambiarse de ropa más seguido.
 - ☐D. Usar un jabón de baño más fuerte.
50. Para prevenir las uñas enterradas debe de
- ☐A. Nunca cortarse las uñas de los pies.
 - ☐B. Cortarse las uñas de los pies igual que las de las manos.
 - ☐C. Cortarse las uñas de los pies a lo largo.
 - ☐D. Mantener las uñas de los pies limpi.

APPENDIX C
FAMILY APGAR INDEX

APGAR INDEX SCALE FOR DIABETIC PARTICIPANT

The following statements are intended to measure the support you feel you receive from your family member or friend concerning your diabetes.

Please mark with an (X) on the line that best explains how you feel about each statement.

Example:

I am satisfied that I can ask my family member or friend for help.

ALMOST
ALWAYS

SOME OF THE
TIME

HARDLY
EVER

X

ALMOST
ALWAYS

SOME OF THE
TIME

HARDLY
EVER

1. I am satisfied that I can turn to my family member or friend for help when something is bothering me.
2. I am satisfied with the way my family member or friend talks over things with me and shares problems with me.
3. I am satisfied that my family member or friend accepts and supports my wishes to choose new activities and ideas.
4. I am satisfied with the way my

family member or friend shows
affection, and responds to my
emotions of anger, sadness, or
love.

5. I am satisfied with the way my
family member or friend and I
spend time together.

LISTA DE INDICES APGAR PARA EL DIABETICO

Las siguientes declaraciones han sido designadas para medir el apoyo que siente que recibe de su pariente o amigo acerca su mantenimiento con la diabetes. Por favor marque con una (X) en la línea que indica mejor como se siente acerca cada declaracion.

Ejemplo:	CASI SIEMPRE	ALGUNAS VECES	CASI NUNCA
Estoy satisfecha que puedo contar con la ayuda de mi pariente o amigo.	X _____	_____	_____

-
- | | | | |
|--|--------------|------------------|------------|
| | CASI SIEMPRE | ALGUNAS
VECES | CASI NUNCA |
| 1. Estoy satisfecho de que puedo contar con la ayuda de mi pariente o amigo cuando tengo algun problema. | _____ | _____ | _____ |
| 2. Estoy satisfecho de la forma en que mi pariente o mi amigo y yo hablamos sobre las cosas y como resolvemos los problemas. | _____ | _____ | _____ |
| 3. Estoy satisfecho de que mi pariente o amigo acepta y apoya mis deseos | | | |

de tener nuevas actividades

o hacer cambios en mi

estilo de vida.

4. Estoy satisfecho de la
forma en que mi pariente
o amigo expresa afecto y
responde a mis sentimientos
como enojo, pena, y amor.

5. Estoy satisfecho de la
forma en que mi pariente
o amigo y yo utilizamos el
tiempo juntos.

APGAR INDEX SCALE FOR SUPPORTER

The following statements are intended to measure the support you feel you give your family member or friend who has diabetes. Please mark with an (X) on the line that best explains how you feel about each statement.

Example:

I am satisfied that my family member or friend can turn to me for help.

ALMOST
ALWAYS

SOME OF THE
TIME

HARDLY
EVER

X

ALMOST
ALWAYS

SOME OF THE
TIME

HARDLY
EVER

1. I am satisfied that my family member or friend can turn to me for help when something is bothering him.
2. I am satisfied that my family member or friend can talk over things with me and share problems with me.
3. I am satisfied that I accept and support my

family member or friend's
wishes to take on new
activities and ideas.

4. I am satisfied with the
way I express affection,
and respond to my family
member or friend's
emotions like anger, love.

5. I am satisfied with the
way my family member or
friend and I share time
together.

LISTA DE INDICES APGAR PARA EL PARIENTE O AMIGO

Las siguientes declaraciones han sido designadas para medir el apoyo que usted siente que le dio a su pariente o amigo acerca el mantenimiento de la diabetes. Por favor marque con una (X) en la línea que indica mejor como se siente acerca cada declaración.

Ejemplo:	CASI SIEMPRE	ALGUNAS VECES	CASI NUNCA
Estoy satisfecho que mi pariente o amigo puede contar con mi ayuda.	X _____	_____ _____	_____ _____

	CASI SIEMPRE	ALGUNAS VECES	CASI NUNCA
1. Estoy satisfecho de que mi pariente o amigo puede contar con mi ayuda cuando tenga algun problema.	_____ _____	_____ _____	_____ _____
2. Estoy satisfecho de la forma en que mi pariente o amigo y yo hablamos sobre las cosas y como resolvemos los problemas.	_____ _____	_____ _____	_____ _____
3. Estoy satisfecho de que yo acepto y apoyo los deseos de mi pariente o amigo de tener nuevas			

actividades o hacer
cambios en su estilo
de vida.

4. Estoy satisfecho de la
forma en que yo expreso
afecto y respondo a los
sentimientos como enojo,
pena, y amor de mi
pariente o amigo.

5. Estoy satisfecho de la
forma en que yo y mi
pariente o amigo
utilizamos el tiempo
juntos.

APPENDIX D
APPROVALS TO CONDUCT STUDY

TEXAS WOMAN'S UNIVERSITY
DENTON DALLAS HOUSTON
HUMAN SUBJECTS REVIEW COMMITTEE - HOUSTON CENTER

HUMAN SUBJECTS REVIEW COMMITTEE REPORT FORM

APPLICANT'S NAME: MAURILIA RODRIGUEZ

PROPOSAL TITLE: THE EFFECT OF A DIABETES EDUCATION PROGRAM ON SOCIAL
SUPPORT, DIABETES KNOWLEDGE LEVEL, BLOOD GLUCOSE LEVEL, AND WEIGHT OF
A SELECT GROUP ON NONINSULIN-DEPENDENT DIABETICS
(applicant must complete top portion of this form)

COMMENTS:

DATE:

11/20/90

[Signature]
Disapprove

[Signature]
Approve

[Signature]
Disapprove

[Signature]
Approve

Disapprove

Approve

Disapprove

Approve

Disapprove

Approve

TEXAS WOMAN'S UNIVERSITY
COLLEGE OF NURSING
DENTON, TEXAS 76204

DALLAS CENTER
1310 HUNTER ROAD
DALLAS, TEXAS 75235

HOUSTON CENTER
1100 M. G. ANDERSON BLVD.
HOUSTON, TEXAS 77030

AGENCY PERMISSION FOR CONDUCTING STUDY*

THE SU CLINICAL FAMILIAR

GRANTS TO Maurilia (Molly) Rodriguez

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

THE EFFECT OF A DIABETES EDUCATION PROGRAM ON SOCIAL SUPPORT, DIABETES KNOWLEDGE LEVEL, BLOOD GLUCOSE LEVEL, AND WEIGHT OF A SELECT GROUP OF NONINSULIN-DIABETICS

The conditions mutually agreed upon are as follows:

1. The agency (~~may~~) (may not) be identified in the final report.
2. The names of consultative or administrative personnel in the agency (~~may~~) (may not) be identified in the final report.
3. The agency (wants) (~~does not want~~) a conference with the student when the report is completed.
4. The agency is (willing) (~~unwilling~~) to allow the completed report to be circulated through interlibrary loan.
5. Other _____

Date: 10-31-70

[Signature]
Signature of Agency Personnel

[Signature]
Signature of Student

[Signature]
Signature of Faculty Advisor

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

/bc

APPENDIX E
CONSENT FORM

CONSENT FOR PARTICIPATION IN CONTROL GROUP
OF A DIABETES STUDY

1. I hereby authorize Maurilia Rodriguez, R.N., to conduct a 10-week study to help diabetics like myself learn more about weight, and blood sugar level. Participating in the study is voluntary and includes taking blood sugar tests at no cost to me, being weighed, and completing three questionnaires. If I do not have a routine clinic visit for these tests to be done, I will be given an appointment. The blood sugar test, weight measurement and the questionnaires will be done at the beginning of the study, five weeks later, and a third time five weeks later. The blood sugar test will be done by technicians by taking the blood from the arm. This test will measure the daily blood sugar level for the previous five weeks. The weight measurement will be taken with a clinic scale. The results of the blood sugar test and weight measurement will be given to my doctor and then placed in my clinic chart. Answering the questionnaires should take approximately an hour and a half. Someone will be available to help me read or write. My answers will remain confidential. The questionnaires will be coded without my name and only the investigator will have the list with the participants' names. At the end of the study, the list will be destroyed and only information as a group will be reported. I can refuse to participate or discontinue participation in the study at any time and continue my usual care at the clinic without intimidation or prejudice.

2. The investigation listed on paragraph 1 has been explained to me by Maurilia Rodriguez, R.N..

3. I understand that the procedures described in paragraph 1 involve the following risks or discomforts: the blood sample taken from my arm for the blood sugar test will be done with care by experienced lab technicians, but I may become nervous, anxious, and feel some discomfort during the procedure; I may become nervous, tired or embarrassed if I have difficulty reading or completing the questionnaires; the information I provide may not be kept confidential; I may develop a localized hematoma and/or infection at the site of the needle puncture.

I understand that the procedures described in paragraph 1 have the following potential benefits to me: the blood sugar tests will not cost me anything; the results of the weight and blood sugar test measurements will help my doctor provide the best care for me by helping him determine the need, type and amount of diabetes medication I should take to manage my diabetes.

I understand that in the event of physical injury

CONTROL GROUP

resulting from this study, Texas Woman's University is not able to offer financial compensation to absorb the costs of medical treatment. However, first aid measures will be provided as necessary.

4. An offer to answer all of my questions regarding the study has been made. A description of the possible risks and discomforts reasonable expected have been discussed with me. I understand that I may discontinue my participation in the study at any time without intimidation or prejudice to me. If I have any questions or concerns relating to the study, I may contact Maurilia Rodriguez, investigator at 350-9121 or 689-2196.

Subject's Signature

Date

Witness Signature

Date

CONSENTIMIENTO PARA PARTICIPAR EN ESTUDIO ACERCA DIABETES
GRUPO CONTROLADO

1. Yo autorizo a Maurilia Rodriguez, R.N., que dirija un estudio de 10 semanas para ayudar diabeticos como yo aprender mas sobre el peso, y nivel de azucar. Participacion es voluntaria e incluye analiz de nivel de azucar sin ningun costo para mi, mi peso, y llenar tres cuestionarios. Si no tengo cita en la clinica durante el tiempo que se van hacer estos procedimientos, me presentare cuando me citen. El analiz del azucar, medida de peso y los cuestionarios se haran al principio del estudio, cinco semanas despues y otra vez en cinco semanas mas. El analiz para nivel del azucar se hara por tecnicos usando sangre del brazo. Este examen medira el nivel de azucar diariamente por las ultimas cinco semanas. El peso se medira con un platillo de balanza. Los resultados del analiz de nivel de azucar y la medida de peso se dara a mi medico y despues se pondra en mi archivo. Tomare como hora y media para llenar los cuestionarios. Habra alguien para ayudarme leer o escribir. Mis respuestas seran confidencial. Los cuestionarios tendran claves sin mi nombre y solamente la investigadora tendra la lista con los nombres de los participantes. Al final del estudio, la lista se destrubira y solamente datos del grupo seran reportados. Puedo negar participar o discontinuar la participacion en el estudio a cual quier momento y recibir el mismo cuidado de siempre en la clinica sin intimidacion o prejuicio contra mi.

2. Maurilia Rodriguez, R.N., me explico la investigacion presentada en parrafo 1.

3. Entiendo que los procedimientos presentados en parrafo 1 incluyen los siguientes riesgos or malestares: la muestra de sangre del brazo para el analiz de nivel de azucar se hara con cuidado por tecnicos con experiencia pero puede ser que me sienta nervioso, ansioso, y un poco de malestar durante el procedimiento; puede ser que me sienta nervioso, cansado o penoso si se me dificulta leer or llenar los cuestionarios; quizas la informacion que yo de no sea confidencial; puede ser que se me haga un moreton o posiblemente se me infecte el brazo en el punto de inyeccion.

Entiendo que los procedimientos presentados en parrafo 1 pueden beneficiar a mi o mis familiares en lo siguiente: analiz de sangre gratuito; ayudar a mi medico darme mejor cuidado porque podra determinar la necesidad, el tipo y cantidad de medicina que yo pueda necesitar para controlar

GRUPO CONTROLADO

mi diabetes.

Entiendo que en caso de herida fisica resultando del estudio, la Texas Woman's University no puede pagar por el costo de tratamiento medico, pero si tendre atencion medica de emergencia si es necesario.

4. Se me explico que mis preguntas acerca el estudio seran contestadas. Los riesgos potenciales y malestares me los explicaron. Entiendo que puedo discontinuar mi participacion en el estudio a cualquier tiempo sin intimidacion o prejuicio contra mi. Si tengo alguna pregunta o incumbencia acerca el estudio, puedo llamar a Maurilia Rodriguez, R.N., al 350-9121 o 689-2196.

FIRMA DE PARTICIPANTE

FECHA

FIRMA DE TESTIGO

FECHA

CONSENT FOR PARTICIPATION IN EXPERIMENTAL GROUP 1
OF A DIABETES STUDY

1. I hereby authorize Maurilia Rodriguez, R.N., to conduct a 10-week study to help diabetics like myself learn more about diabetes, weight, and blood sugar level. Participating in the study is voluntary and includes taking blood sugar tests at no cost to me, being weighed, completing three questionnaires and attending a three-week diabetes education program with a family member or friend present. If I do not have an appointment for a routine clinic visit when these tests can be done, I will be given an appointment. The blood sugar test, weight measurement and the questionnaires will be done at the beginning of the study, at the end of the diabetes education program, and again five weeks later. The blood sugar test will be done by technicians by taking the blood from the arm. This test will measure the daily blood sugar level for the past five weeks. The weight measurement will be taken with a clinic scale. The results of the blood sugar test and weight measurement will be given to my doctor and then placed in my clinic chart. Answering the questionnaires should take approximately an hour and a half. Someone will be available to help me read or write. My answers will remain confidential. The questionnaires will be coded without my name and only the investigator will have the list with the participants' names. At the end of the study, the list will be destroyed and only information as a group will be reported. The diabetes education program will last three weeks. The family member or friend is a very important part of the study and should be one whom I believe can learn with me and help me with my diabetes. Both of us will meet for an hour each week to receive information on diabetes, nutrition, exercise, and general diabetic care, such as care of the feet and skin. I will be able to discuss problems and share ideas concerning my diabetes. The family member or friend is asked only to attend the classes and complete two questionnaires with respect to the education classes and the support given to me. I can refuse to participate or discontinue participation in the study at any time and continue my usual care at the clinic without intimidation or prejudice.

2. The investigation listed on paragraph 1 has been explained to me by Maurilia Rodriguez, R.N..

3. I understand that the procedures described in paragraph 1 involve the following risks or discomforts: the blood sample taken from my arm for the blood sugar test will be done with care by experienced lab technicians, but I may become nervous, anxious, and feel some discomfort during the

EXPERIMENTAL GROUP #1

procedure; I may become nervous, tired or embarrassed if I have difficulty reading or completing the questionnaires; the information I provide may not be kept confidential; I may develop a localized hematoma and/or infection at the site of the needle puncture.

I understand that the procedures described in paragraph 1 have the following potential benefits to myself and/or others: I may learn about how to improve my health and that of a any family member who has diabetes; I would have an opportunity to meet with other diabetics to share ideas, discuss problems and support each other; the blood sugar tests will not cost me anything; the results of the weight and blood sugar test measurements will help my doctor provide the best care for me by helping him determine the need, type and amount of diabetes medication I should take to manage my diabetes; and having a family member or friend with me may encourage me to learn as much as possible about my diabetes and how best to care for myself.

I understand that in the event of physical injury resulting from this study, Texas Woman's University is not able to offer financial compensation to absorb the costs of medical treatment. However, first aid measures will be provided as necessary.

4. An offer to answer all of my questions regarding the study has been made. A description of the possible risks and discomforts reasonable expected have been discussed with me. I understand that I may discontinue my participation in the study at any time without intimidation or prejudice to me. If I have any questions or concerns relating to the study, I may contact Maurilia Rodriguez, investigator at 350-9121 or 689-2196.

Subject's Signature

Date

Witness Signature

DATE

CONSENTIMIENTO PARA PARTICIPAR EN ESTUDIO ACERCA DIABETES
GRUPO EXPERIMENTAL #1

1. Yo autorizo a Maurilia Rodriguez, R.N., que dirija un estudio de 10 semanas para ayudar diabeticos como yo aprender mas sobre la diabetes, el peso, y nivel de azucar. Participacion es voluntaria e incluye analiz de nivel de azucar sin ningun costo para mi, mi peso, llenar tres cuestionarios y asistir un programa de educacion con un familiar o amigo presente por tres semanas. Si no tengo cita en la clinica durante el tiempo que se van hacer estos procedimientos, me presentare cuando me citen. El analiz del azucar, medida de peso y los cuestionarios se haran al principio del estudio, al final del programa de educacion de diabetes, y otra vez en cinco semanas. El analiz para nivel del azucar se hara por tecnicos usando sangre del brazo. Este examen medira el nivel de azucar diariamente por las ultimas cinco semanas. El peso se medira con un platillo de balanza. Los resultados del analiz de nivel de azucar y la medida de peso se dara a mi medico y despues se pondre en mi archivo. Tomare como hora y media para llenar los cuestionarios. Habra alguien para ayudarme leer o escribir. Mis respuestas seran confidencial. Los cuestionarios tendran claves sin mi nombre y solamente la investigadora tendra la lista con los nombres de los participantes. Al final del estudio, la lista se destrubira y solamente datos del grupo seran reportados. El programa de educacion acerca la diabetes durara tres semanas. El familiar o amigo es muy importante para el estudio y debe ser alguien que pueda aprender y ayudarme con mi diabetes. Los dos nos juntaremos cada semana por una hora para recibir informacion acerca diabetes, nutricion, ejercicios y cuidado de diabetes en general tal como cuidado de los pies y la piel. Tendre oportunidad de discutir problemas y participar en intercambio de ideas acerca mi diabetes. Se le pide a mi familiar o amigo que asista las clases y que llene dos cuestionarios con respeto a las clases de educacion y el apoyo que me dara. Puedo negar participar o discontinuar la participacion en el estudio a cual quier momento y recibir el mismo cuidado de siempre en la clinica sin intimidacion o prejuicio contra mi.

2. Maurilia Rodriguez, R.N., me explico la investigacion presentada en parrafo 1.

3. Entiendo que los procedimientos presentados en parrafo 1 incluyen los siguientes riesgos or malestares: la muestra de sangre del brazo para el analiz de nivel de azucar se hara con cuidado por tecnicos con experiencia pero puede ser que me sienta nervioso, ansioso, y un poco de malestar durante el procedimiento; puede ser que me sienta nervioso,

GRUPO EXPERIMENTAL #1

cansado o penoso si se me dificulta leer or llenar los cuestionarios; puede ser que la informacion que de no sea confidencial; puede ser que se me haga un moreton o posiblemente se me infecte el brazo en el punto de inyeccion.

Entiendo que los procedios presentados en parrafo 1 pueden beneficiar a mi o mis familiares en lo siguiente: aprender como mejorar mi salud o la de cualquier familiar con diabetes; tener oportunidad de juntarme con otros diabeticos y discutir ideas, problemas, apoyo; analiz de sangre gratuito; ayudar a mi medico darme mejor cuidado porque podra determinar la necesidad, el tipo y cantidad de medicina que yo pueda necesitar para controlar mi diabetes; y mi familiar o amigo conmigo me podra animar a aprender lo mas posible sobre mi diabetes y la mejor manera de cuidarme.

Entiendo que en caso de herida fisica resultando del estudio, la Texas Woman's University no puede pagar por el costo de tratamiento medico, pero si tendre atencion medica de emergencia si es necesario.

4. Se me explico que mis preguntas acerca el estudio seran contestadas. Los riesgos potenciales y malestares me los explicaron. Entiendo que puedo discontinuar mi participacion en el estudio a cualquier tiempo sin intimidacion o prejuicio contra mi. Si tengo alguna pregunta o incumbencia acerca el estudio, puedo llamar a Maurilia Rodriguez, R.N., al 350-9121 o 689-2196.

FIRMA DE PARTICIPANTE

FECHA

FIRMA DE TESTIGO

FECHA

CONSENT FOR PARTICIPATION IN EXPERIMENTAL GROUP 2
OF A DIABETES STUDY

1. I hereby authorize Maurilia Rodriguez, R.N., to conduct a 10-week study to help diabetics like myself learn more about diabetes, weight, and blood sugar level. Participating in the study is voluntary and includes taking blood sugar tests at no cost to me, being weighed, completing three questionnaires and attending a three-week diabetes education program. If I do not have a routine clinic visit for these tests to be done, I will be given an appointment. The blood sugar test, weight measurement and the questionnaires will be done at the beginning of the study, at the end of the diabetes education program, and again five weeks later. The blood sugar test will be done by technicians by taking the blood from the arm. This test will measure the daily blood sugar level for the past five weeks. The weight measurement will be taken with a clinic scale. The results of the blood sugar test and weight measurement will be given to my doctor and then placed in my clinic chart. Answering the questionnaires should take approximately an hour and a half. Someone will be available to help me read or write. My answers will remain confidential. The questionnaires will be coded without my name and only the investigator will have the list with the participants' names. At the end of the study, the list will be destroyed and only information as a group will be reported. The diabetes education program will last three weeks. I will meet for an hour each week to receive information on diabetes, nutrition, exercise, and general diabetic care, such as care of the feet and skin. I will be able to discuss problems and share ideas concerning my diabetes. I can refuse to participate or discontinue participation in the study at any time and continue my usual care at the clinic without intimidation or prejudice.

2. The investigation listed on paragraph 1 has been explained to me by Maurilia Rodriguez, R.N..

3. I understand that the procedures described in paragraph 1 involve the following risks or discomforts: the blood sample taken from my arm for the blood sugar test will be done with care by experienced lab technicians, but I may become nervous, anxious, and feel some discomfort during the procedure; I may become nervous, tired or embarrassed if I have difficulty reading or completing the questionnaires; the information I provide may not be kept confidential; I may develop a localized hematoma and/or infection at the site of the needle puncture.

I understand that the procedures described in paragraph 1 have the following potential benefits to myself and/or

EXPERIMENTAL GROUP #2

others: I may learn about how to improve my health and that of a any family member who has diabetes; I would have an opportunity to meet with other diabetics to share ideas, discuss problems and support each other; the blood sugar tests will not cost me anything; the results of the weight and blood sugar test measurements will help my doctor provide the best care for me by helping him determine the need, type and amount of diabetes medication I should take to manage my diabetes.

I understand that in the event of physical injury resulting from this study, Texas Woman's University is not able to offer financial compensation to absorb the costs of medical treatment. However, first aid measures will be provided as necessary.

4. An offer to answer all of my questions regarding the study has been made. A description of the possible risks and discomforts reasonable expected have been discussed with me. I understand that I may discontinue my participation in the study at any time without intimidation or prejudice to me. If I have any questions or concerns relating to the study, I may contact Maurilia Rodriguez, investigator at 350-9121 or 689-2196.

Subject's Signature

Date

Witness Signature

Date

CONSENTIMIENTO PARA PARTICIPAR EN ESTUDIO ACERCA DIABETES
GRUPO EXPERIMENTAL #2

1. Yo autorizo a Maurilia Rodriguez, R.N., que dirija un estudio de 10 semanas para ayudar diabeticos como yo aprender mas sobre la diabetes, el peso, y nivel de azucar. Participacion es voluntaria e incluye analiz de nivel de azucar sin ningun costo para mi, mi peso, llenar tres cuestionarios y asistir un programa de educacion por tres semanas. Si no tengo cita en la clinica durante el tiempo que se van hacer estos procedimientos, me presentare cuando me citen. El analiz del azucar, medida de peso y los cuestionarios se haran al principio del estudio, al final del programa de educacion de diabetes, y otra vez en cinco semanas. El analiz para nivel del azucar se hara por tecnicos usando sangre del brazo. Este examen medira el nivel de azucar diariamente por las ultimas cinco semanas. El peso se medira con un platillo de balanza. Los resultados del analiz de nivel de azucar y la medida de peso se dara a mi medico y despues se pondre en mi archivo. Tomare como hora y media para llenar los cuestionarios. Habra alguien para ayudarme leer o escribir. Mis respuestas seran confidencial. Los cuestionarios tendran claves sin mi nombre y solamente la investigadora tendra la lista con los nombres de los participantes. Al final del estudio, la lista se destrubira y solamente datos del grupo seran reportados. El programa de educacion acerca la diabetes durara tres semanas. Cada semana por una hora recibire informacion acerca la diabetes, nutricion, ejercicios y cuidado de diabetes en general tal como cuidado de los pies y la piel. Tendre oportunidad de discutir problemas y participar en intercambio de ideas acerca mi diabetes. Puedo negar participar o discontinuar la participacion en el estudio a cual quier momento y recibir el mismo cuidado de siempre en la clinica sin intimidacion o prejuicio contra mi.

2. Maurilia Rodriguez, R.N., me explico la investigacion presentada en parrafo 1.

3. Entiendo que los procedimientos presentados en parrafo 1 incluyen los siguientes riesgos or malestares: la muestra de sangre del brazo para el analiz de nivel de azucar se hara con cuidado por tecnicos con experencia pero puede ser que me sienta nervioso, ansioso, y un poco de malestar durante el procedimiento; puede ser que me sienta nervioso, cansado o penoso si se me dificulta leer or llenar los cuestionarios; quizas la informacion que yo de no sea

GRUPO EXPERIMENTAL #2

confidencial; puede ser que se me haga un moreton o posiblemente se me infecte el brazo en el punto de inyeccion.

Entiendo que los procedimientos presentados en parrafo 1 pueden beneficiar a mi o mis familiares en lo siguiente: aprender como mejorar mi salud o la de cualquier familiar con diabetes; tener oportunidad de juntarme con otros diabeticos y discutir ideas, problemas, apoyo; analiz de sangre gratuito; ayudar a mi medico darme mejor cuidado porque podra determinar la necesidad, el tipo y cantidad de medicina que yo pueda necesitar para controlar mi diabetes.

Entiendo que en caso de herida fisica resultando del estudio, la Texas Woman's University no puede pagar por el costo de tratamiento medico, pero si tendre atencion medica de emergencia si es necesario.

4. Se me explico que mis preguntas acerca el estudio seran contestadas. Los riesgos potenciales y malestares me los explicaron. Entiendo que puedo discontinuar mi participacion en el estudio a cualquier tiempo sin intimidacion o prejuicio contra mi. Si tengo alguna pregunta o incumbencia acerca el estudio, puedo llamar a Maurilia Rodriguez, R.N., al 350-9121 o 689-2196.

FIRMA DE PARTICIPANTE

FECHA

FIRMA DE TESTIGO

FECHA

APPENDIX F
DEMOGRAPHIC DATA SHEET

DEMOGRAPHIC DATA SHEET

Please fill in the following information about yourself or place a () next to the item that best describes you.

_____Male;_____Female

Age_____

Ethnic Background:

- 1) Hispanic American_____
- 2) Afro American _____
- 3) Anglo American _____
- 4) Other (Please specify)_____

Education Background:

- 1) Less than 8 years _____
- 2) Completed Elementary School_____
- 3) Some High School _____
- 4) Graduated from High School _____

Language spoken most in the home_____English;_____Spanish

How long have you had diabetes?_____Years_____Months

Are you taking insulin now? _____Yes;_____No

If no, have you taken insulin in the past? _____Yes;_____No

Are you taking diabetes pills now? _____Yes;_____No

If no, have you ever taken diabetes pills? _____Yes;_____No

Have you ever attended classes for diabetes? _____Yes;_____No

If yes, how many classes?_____; How long ago?_____Years;_____Months

Are you under a doctor's care for diabetes? _____Yes;_____No

If yes, how long have you been under a doctor's care?____Years____Months

DATOS DEMOGRAFICOS

Por favor llene la informacion sobre sus datos personales marcando con una () de acuerdo a la respuesta que describe su persona.

____ Masculino; ____ Femenino

Edad ____

Grupo Etnico:

1) Hispano Americano ____

2) Afro Americano ____

3) Anglo Americano ____

4) Otro (Por favor indique) ____

Educacion:

1) Menos de 8 anos ____

2) Termino escuela primaria ____

3) Estudio parte de secundaria ____

4) Graduado de secundaria ____

Idioma(s) que mas se habla en la casa ____ ingles; ____ espanol

Cuanto tiempo tiene con su diabetes? ____ Anos; ____ Meses

Esta tomando insulina ahora? ____ Si; ____ No

Si no, la ha tomado anteriormente? ____ Si; ____ No

Esta tomando pastillas para la diabetes ahora? ____ Si; ____ No

Si no, las ha tomado anteriormente? ____ Si; ____ No

Ha asistido alguna vez a las clases para la diabetes? ____ Si; ____ No

Si ha asistido, cuantas clases ha asistido? ____; Hace cuanto tiempo? ____ Anos; ____ Meses

Esta bajo cuidado medico para su diabetes? ____ Si; ____ No

Si es que si, por cuanto tiempo? ____ Anos; ____ Meses

APPENDIX G
TABLES OF ADDITIONAL FINDINGS

Table A

Frequencies of Pretest Item Responses by NIDDM Subjects to
Family APGAR Index Measuring Satisfaction with
Social Support by Category of Support

Item	<u>n</u>	<u>Categories of Support^a</u>		
		S	NS	N
1. Having him there will help me learn more.	3	x		
2. ____ will bring me to classes.	4	x		
3. ____ will encourage me to follow my diet.	2		x	
4. ____ will not be able to help me much except to tell me not to eat too much.	1			x
5. ____ can answer my questions or explain things to me.	2	x		
6. ____ can encourage me to take better care of myself.	1		x	
7. ____ will take care of my by giving me my <u>insulin</u> and meals.	1	x		
8. ____ can review the topics presented <u>in class</u> with me.	4	x		
9. I hope she will learn more about diabetes to tell me what to do.	1		x	
10. I hope ____ will be more patient with me.	<u>1</u>		x	
Total	20			

^aS = Specific; NS = Nonspecific; N = Negative

Table B

Frequencies of Posttest Item Responses by NIDDM Subjects to
Family APGAR Index Measuring Satisfaction with
Social Support by Category of Support

Item	<u>n</u>	<u>Categories of Support^a</u>		
		S	NS	N
1. I learned more because ____ was with me.	3	x		
2. ____ brought me to the classes.	3	x		
3. ____ encouraged me to practice what we learned.	2		x	
4. ____ encouraged me to learn as much as possible to take better care of myself.	1		x	
5. ____ explained some information to me.	3	x		
6. ____ reviewed the information with me.	1	x		
7. ____ encouraged me by telling me the <u>classes</u> were good for us.	1		x	
8. ____ told me what I needed to do to <u>control</u> my diabetes.	1		x	
9. ____ listened to my complaints and <u>helped</u> me choose foods I can eat.	1	x		
10. ____ allowed me to eat the tamales, <u>cakes</u> at Christmas because it's only once a year.	1	x		
11. I though we were both interested in diabetes and wanted to learn, but I don't think she helped me learn.	<u>1</u>		x	
Total	18			

^aS = Specific; NS = Nonspecific; N = Negative

Table C

Frequencies of Pretest Item Responses by Family Members or Friends of NIDDM Subjects to Family APGAR Index Measuring Satisfaction with Social Support by Category of Support

Item	<u>n</u>	<u>Categories of Support^a</u>		
		S	NS	N
1. By being there to encourage good eating habits.	3	x		
2. Take to classes and help explain information.	4	x		
3. Explain things I think she won't understand.	1	x		
4. Asking her if she has questions during the classes.	1	x		
5. Remind her to attend the classes.	1	x		
6. Make her pay more attention to what's good for her.	1		x	
7. I'll try to prepare the foods he needs to eat.	1	x		
8. Discuss the information together.	2	x		
9. Listening to how he feels and helping him in any way I can.	1	x		
10. Get after her when I think she's overdoing it with her food.	1		x	
11. Encourage her to walk every day.	1		x	
12. Give her insulin.	1	x		
13. I'd like to help her control her diabetes so she doesn't wind up with no legs like me.	<u>1</u>		x	
Total	20			

^aS = Specific; NS = Nonspecific; N = Negative

Table D

Frequencies of Posttest Item Responses by Family Members or Friends of NIDDM Subjects to Family APGAR Index Measuring Satisfaction with Social Support by Category of Support

Item	n	Categories of Support ^a		
		S	NS	N
1. I kept telling her to learn as much as possible.	1	x		
2. Took her to classes even though she had other things she would rather do.	2	x		
3. Spent a lot of time together and told her not to overeat.	2	x		
4. I tried to explain things to her, but since I can't see so good any more, I don't feel so good about not doing more.	1			x
5. I answered her questions.	1	x		
6. I provided emotional support, reviewed the information, and practiced what we learned.	1	x		
7. I reminded her to go to class.	1	x		
8. I pointed out good health practices I learned.	1		x	
9. I served him and took care of him.	1	x		
10. I explained as much as I could.	1	x		
11. Listened to him.	1	x		
12. I told him I'll practice what I learned.	1	x		
13. I was around her to keep her in line.	1	x		
14. We walked every day & I gave her insulin.	1	x		
15. I helped her realize she needed to exercise.	1	x		
16. I encouraged her to follow her diet.	<u>1</u>		x	
Total	18			

^aS = Specific; NS = Nonspecific; N = Negative