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**Health beliefs of insulin dependent diabetics and non-insulin  
dependent diabetics**

**Wortell, Linda Harbaugh, M.S.**

**The University of Arizona, 1987**

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HEALTH BELIEFS OF  
INSULIN DEPENDENT DIABETICS AND  
NON-INSULIN DEPENDENT DIABETICS

by

Linda Harbaugh Wortell

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A thesis Submitted to the Faculty of the

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For the Degree of

MASTER OF SCIENCE

In the Graduate College

THE UNIVERSITY OF ARIZONA

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## ABSTRACT

The descriptive study which explored the insulin dependent diabetics' and non-insulin dependent diabetics' perceptions of susceptibility to diabetic complications, severity of diabetes, and benefits of and barriers to preventive measures.

The Wortell Diabetic Perception Scale was developed by the researcher for this study, and administered to a convenience sample of 71 subjects. The subjects' age ranged from 22 to 80 years. There were 33 females and 38 males in the sample. Forty three percent of the diabetics were classified as insulin dependent diabetics and 57% as non-insulin dependent diabetics.

Findings indicated that insulin dependent diabetics perceived diabetes to be significantly more severe than did non-insulin dependent diabetics. No significant difference was found to exist between the insulin dependent diabetics and non-insulin dependent diabetics with regards to perceived susceptibility to diabetic complications, and benefits of and barriers to preventive measures.

## CHAPTER 1

### INTRODUCTION

Approximately 10 million Americans, or 5% of the population, currently are diagnosed with diabetes mellitus (Davidson, 1986). The National Commission of Diabetes estimated a similar number of people with diabetes remain undiagnosed (Davidson, 1986). Ninety percent of the diagnosed diabetics are classified as non-insulin dependent diabetics, while the remaining ten percent are classified as insulin dependent diabetics (Closing the Gap, 1985). The focus of the present study was to identify and describe differences in health beliefs in the insulin dependent diabetics and the non-insulin dependent diabetics.

At the turn of the century the life expectancy of a diabetic was less than one year. The common treatment was to starve the diabetic individual in order to control the "sugar in the urine". In 1921, insulin was discovered in Toronto, and became readily available by the mid-1923. However, health care professionals, as well as diabetics, quickly recognized insulin was not a cure to diabetes. (Schade, Santiago, Skyles, & Rizza, 1983).

Insulin dependent and non-insulin dependent diabetics are differentiated by age of onset, etiology, prognosis, and medical therapies, yet both groups share the same goal of treatment, normoglycemia (Jenny, 1986). The normoglycemia goal for insulin dependent diabetics, as well as non-insulin dependent diabetics, involves a therapeutic regimen which balances the diabetic's diet, exercise, and medications. Although research on the effects of normoglycemia on diabetic control is limited, it is reasonable to expect that maintenance of normoglycemia will impede the progression of diabetic complications (Levin, McLaughlin, & Kowarski, 1984).

Nurses, as health care professionals, have the responsibility to provide quality diabetic patient education which is the keystone to obtaining and maintaining normoglycemia in insulin dependent and non-insulin dependent diabetics. The National Commission on Diabetes, in 1974, recommended the Centers for Disease Control implement educational programs to decrease the mortality and morbidity of diabetics (Alogna, 1985). Teaching programs have been established on the assumption that insulin dependent and non-insulin dependent diabetic needs are the same, except for the information on insulin. Research suggested the insulin dependent and non-insulin dependent diabetics' needs were different, but no research identifying these differences has been reported. Therefore, this study identified and described the perceptions of the insulin dependent and non-insulin dependent diabetics in relation to their disease and disease process. From these data, research based education programs can be formulated. To establish and provide quality diabetic patient education, health care professionals need to identify the insulin dependent and non-insulin dependent diabetics' health beliefs with regards to susceptibility to diabetic complications, severity of diabetes, and benefits of and barriers to preventive measures.

#### Statement of the Problem

The National Diabetes Data Group developed a classification system of diabetes mellitus and other carbohydrate metabolism abnormalities. Insulin dependent diabetics are ketosis-prone individuals with "increased or decreased frequency of certain histocompatibility antigens (HLA) on chromosome 6 and with islet cell antibodies" (Vranic, 1985, p.2). Insulin dependent diabetics were formerly referred to as juvenile-onset diabetics. Age is no longer the main criterion for classification of patients with various types of diabetes. Non-insulin dependent diabetics are nonketosis prone individuals (Vranic, 1985). Non-insulin dependent diabetics were formerly referred to as adult-onset diabetics. Additional classifications of altered carbohydrate metabolism include gestational diabetes, impaired glucose tolerance, and previous abnormality of glucose tolerance. (Vranic, 1985).

A key concept to classifying diabetics is whether or not the individual's body is "dependent" on insulin. Laakso, and Pyorala's (1985) research studied the age relationship of insulin dependent and non-insulin dependent diabetics. They classified insulin dependent diabetic as an individual who is (1) treated initially and thereafter with insulin, and (2) presents with ketonuria or ketoacidosis at the time of diagnosis (Laakso, & Pyorala, 1985). Laakso, and Pyorala (1985) classified a non-insulin dependent diabetic as one who is (1) treated initially with diet and/or oral hypoglycemic agents, (2) not treated with insulin within one year of diagnosis, and (3) presents with no ketonuria nor ketoacidosis at time of diagnosis.

In the past twenty years research has focused on young people with diabetes, especially insulin dependent diabetics, 95% of whom experienced onset of diabetes before the age of 20 (Marble, 1985). However, the majority of diabetics are over the age of 40 (Marble, 1985). Primarily these patients have non-insulin dependent diabetes and impaired glucose tolerance. There is a great need for more aggressive treatment and research for the non-insulin dependent diabetics, especially for those over the age of 40. (Marble, 1985).

Jenny (1986) supported the presence of adaptation differences between insulin dependent diabetics and non-insulin dependent diabetics. Jenny (1986) reported adaptation differences occurred in five areas: instruction received, perceived regimen benefits, social support, special concerns, and reported compliance to the regimen. In each of the five areas the insulin dependent diabetic group scored higher on a self-report questionnaire, "suggesting that increased disease severity is associated with improved compliance, increased number of concerns, more instruction, sharpened perception of regimen benefits, and more social support" (Jenny, 1986, p.44). These findings suggested that diabetics may benefit from education that recognized the individuals' perception of disease severity and regimen benefits.

Presently, diabetic education programs are directed toward insulin dependent diabetics. When instructing non-insulin dependent diabetics, nurses use the same diabetes education program with the insulin section of the patient education program omitted. Because diabetes is a he-

tergenous disease, nurses should teach information related to the etiology, manifestations, and disease progression in insulin dependent diabetic differently from that which is taught to the non-insulin dependent diabetic. Perceptions and adaptation of individuals to the specific types of diabetes are different. Patient education programs for the insulin dependent and non-insulin dependent diabetics should be directed to those aspects which are both common and unique to each type of diabetes mellitus. The content, as well as the teaching method, of the diabetic educational materials nurses provide must be individualized to the type of diabetes and the diabetic's perception of the disease.

The literature supported the need for individualized diabetic teaching (Rottkamp, & Donohue-Porter, 1983). Rottkamp, and Donohue-Porter's (1983) research on the role of diabetic needs and preferences emphasized the diabetics' preference for structured learning rather than unstructured learning. However, the study (Rottkamp, & Donohue-Porter, 1983) did not explore nor differentiate between insulin dependent diabetic and non-insulin dependent diabetic learning needs and preferences.

Hiss (1986) studied the impact of the diabetic's involvement on the health care provided. An "activated patient" is an individual involved in self-care and medical decisions regarding his/her illness (Hiss, 1986). Hiss (1986) stated an "activated patient" perceives diabetes as serious. However, Hiss (1986) did not differentiate between insulin dependent diabetics' and non-insulin dependent diabetics' involvement in self-care and diabetic education.

Mazzuca's, et al. (1986) stated the amount of experimental research on diabetes education was not sufficient from which to draw conclusions. The National Diabetes Data Group classification of diabetics (Vranic, 1985) was not utilized in the study; therefore, the subjects were not classified as insulin dependent or non-insulin dependent diabetics. Mazzuca, et al., (1986) reported that a systematic approach to diabetic education can have prolonged effects on the diabetic's self-care, and chronic vascular complications, but did not differentiate between insulin dependent and non-insulin dependent diabetics.

Although 98% of diabetics are over the age of 16, a review of literature reveals little information on adult reactions to diabetes and the impact of diabetes on daily living (Fisher, Delamater, Bertelson, & Kirkley, 1982). Jenny (1986) suggested non-insulin dependent diabetics may perceive their disease as less threatening, than insulin dependent diabetics; therefore, non-insulin dependent diabetics may be less compliant with their self-care practices. In addition Jenny's (1986) findings suggested the need for an increased emphasis on assisting the diabetic individual to adapt to his/her daily regimen.

Diabetic education programs used by nurses need to be based on research which identifies individual health beliefs in relation to the diabetics' perceptions of his/her disease. At this time, there are no reported studies in the literature which identify the perceptions of the insulin dependent and non-insulin dependent diabetic with regards to susceptibility to diabetic complications, disease severity, and benefits of and barriers to preventive measures. Thus, the present study provided information essential to health care of diabetic patients.

#### Significance of the Problem

The National Commission on Diabetes statistics demonstrated that diabetes is the third leading cause of death in the United States (Davidson, 1986). Factors contributing to the high morbidity and mortality of diabetics, according to Alogna (1985), included inadequate patient education and self-care; inadequate provider knowledge and proficiency; lack of third party reimbursement for ambulatory diabetes education; inadequate planning, coordination, and evaluation of health services and resources for persons with diabetes; and inadequate morbidity and mortality data. "Quality patient education is an integral part of diabetes care and improved access to quality education will ultimately lead to improved health outcomes for persons with diabetes" (Alogna, 1985, p.36). Nurses, as health care providers and teachers, are responsible for providing quality diabetic patient education.

An acute illness has a rapid onset and demands immediate active health care, which often leaves very little time for patient education and patient involvement in the treatment. On the other hand, a chronic illness, such as diabetes mellitus, usually has a gradual onset which permits time for patient education and patient involvement in self care activities. Successful treatment modalities of many chronic illnesses, such as diabetes mellitus, depend to a great extent on the patient's adherence to a plan of care. The individual must live with the illness on a daily basis, and therefore must assume responsibility for multiple activities associated with prescribed treatment, medications, diet, activity, and stress.

A discrepancy between the information provided in diabetic education classes and the individual's application of the information to daily living is often labelled as noncompliance by the health care professionals. Jenny (1986) reported that subjects attributed noncompliance mainly to difficulty, lack of planning, and inconvenience, but did not attribute noncompliance to the lack of knowledge. Application of the knowledge to the individual's daily lifestyle was the problem. Rather than simply imparting information during diabetic teaching, nurses as health care professionals must assist the diabetic in using the information in his/her daily activities. More time must be spent helping individuals restructure their daily routines to accommodate their regime, and to identify individual strategies for dealing with perceived difficulties. However, in order to do this, nurses need information which identifies and describes the insulin dependent as well as the non-insulin dependent diabetics perceptions in regards to susceptibility to diabetic complications, severity of diabetes, and benefits of and barriers to preventive measures.

Therefore, the problem of this study was to identify the insulin dependent and non-insulin dependent diabetics' perception of susceptibility to diabetic complications, severity of diabetes, and benefits of and barriers to preventive measures. Differences, if any, between insulin dependent diabetics and non-insulin dependent diabetics perceptions were also identified and described. A secondary focus of the study was to develop and test an instrument which identified the insulin dependent and non-insulin dependent diabetics' perceptions with regards to

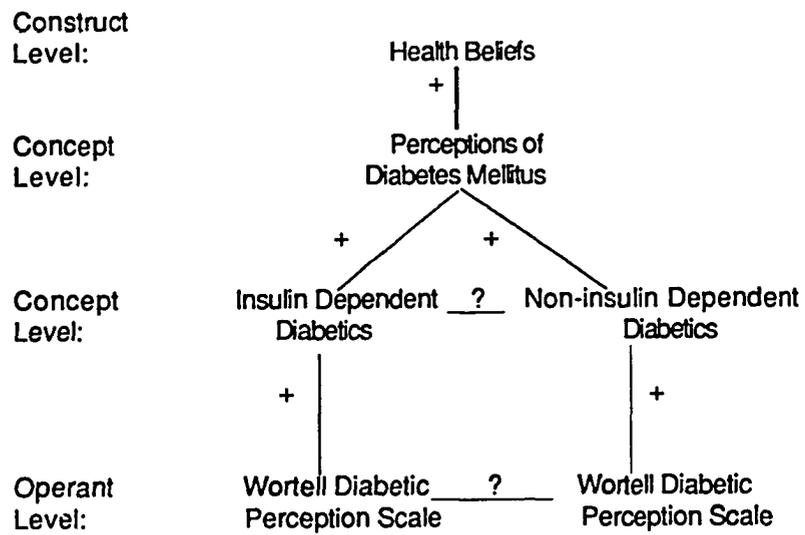
susceptibility to diabetic complications, severity of diabetes, and benefits of and barriers to preventive measures.

### Conceptual Framework

The conceptual framework for this study was based on the Health Belief Model (Becker, 1974). In addition, the concepts of insulin dependent diabetic perceptions of diabetes mellitus and non-insulin dependent diabetic perceptions of diabetes mellitus underlie the conceptual framework for the study. The variables of perceived susceptibility to diabetic complications, severity of diabetes, and benefits of and barriers to preventive measures were related to the health beliefs of insulin dependent and non-insulin dependent diabetics. The direction of the relationship among the variables was not predicted. A diagrammatic representation of the conceptual framework as it relates to insulin dependent and non-insulin dependent diabetics' perceptions of health beliefs is depicted in Figure 1. The construct, concept, and operant levels of the conceptual framework will be discussed in the following sections.

### Health Beliefs

The purpose of this study was to describe the diabetics' health beliefs in relation to their perceptions of the susceptibility to diabetic complications, severity of diabetes, and benefits of and barriers to preventive measures. The conceptual framework for the study was based on the Health Belief Model (HBM), formulated by Hochbaum, Leventhal, Kegeles, and Rosenstock (Maiman, & Becker, 1974). During the early 1950's, an increased emphasis was placed on prevention of disease (Becker, 1974). However, the public often failed to accept disease preventives and screening tests for early detection of diseases (Rosenstock, 1974). Health was a state of complete physical, mental, or social well-being and not merely the absence of disease or infirmity (Thomas, 1977). Health beliefs were the relationships between an individual's attitudes and his/her behaviors toward health. The Health Belief Model incorporated socio-psychological variables in explaining individuals' preventive health behavior (Maiman, & Becker, 1974).



**Figure 1. Conceptual Framework for Health Beliefs and Perceptions of the Insulin Dependent and Non-insulin Dependent Diabetic**

The Health Belief Model provided a framework for the evaluation of the subjective actions of individuals. The following theoretical conditions and components were proposed by the Health Belief Model: (1) a psychological "readiness for action" in regards to a health condition, which was determined by the individual's perceived susceptibility and severity; and (2) the evaluation by the individual of the preventive measures in regards to feasibility and efficaciousness (benefits), which were weighed against the individual's perceptions of psychological as well as other barriers to the proposed preventive measures (Maiman, & Becker, 1974). Rosenstock(1974) viewed an individual's daily activities as a process of opposing positive and negative forces, rather than a more holistic view of an individual's health.

The Health Belief Model assumed that for an individual to take action to avoid a disease he/she needed to believe that (1) he/she was personally susceptible to the disease, (2) the occurrence of the disease was moderately severe, (3) taking particular actions in fact were beneficial through reducing susceptibility to the disease, or reducing severity, and (4) taking particular actions did not involve overcoming psychological barriers like cost, convenience, pain, and embarrassment (Rosenstock, 1974). Health beliefs were the sum of the individual's perceptions of susceptibility, severity, and benefits minus the barriers (Rosenstock, 1974). According to Champion (1984), an individual's health behavior resulted from the combination of attitudes related to the five concepts in the Health Belief Model.

Several research studies have investigated the relationships between attitudes and health behaviors utilizing the Health Belief Model (Hijek, 1985; Hochbaum, 1956; Kegeles, 1963; Leavitt, 1979). Since 1952, constructs in the Health Belief Model have been empirically tested (Champion, 1984). However, invalid or unreliable data collection instruments and limited sample sizes were associated with past research (Champion, 1984).

### Perceptions

A perception was the process of being aware of objects and receiving sensory impressions (Thomas, 1977); a perception was a process of an awareness or insight. The perceptions of the insulin dependent diabetic and the non-insulin dependent diabetic in relation to susceptibility to diabetic complications, disease severity, benefits of and barriers to preventive measures, and cues to action were unknown at this time. Identifying the insulin dependent and non-insulin dependent diabetics' perceptions with regards to their perceptions of susceptibility to diabetic complications, severity of diabetes, and benefits of and barriers to preventive measures, and the relationship between the variables, if any, were among the goals of this study.

#### Perceived susceptibility.

The perceived susceptibility to a disease varies from one individual to another. Perceived susceptibility to diabetic complications referred to the diabetic's belief of subjective risks of contracting a complication of diabetes within a specified time period. (Champion, 1984; Hijeck, 1984; Rosenstock, 1974). Perceived susceptibility to diabetic complications may range from denying any possibility of developing diabetic complications, to admitting the "statistical" possibility of developing diabetic complications, to expressing a real fear of developing diabetic complications. "Perceived susceptibility and severity having a strong cognitive component are at least partly dependent on knowledge" (Rosenstock, 1974, p.4).

#### Perceived severity.

Perceived severity of diabetes was defined as the individual's perception of "harmful consequences of the condition in relation to altering personal physical health, role, social status, and ability to complete desired tasks" (Champion, 1984, p.77). As with the perceived susceptibility to diabetic complications, perceptions of the seriousness of diabetes vary from individual to individual. The degree of seriousness of diabetes may be determined by the degree of emotional arousal

from the thought of diabetes, as well as the types of difficulties the individual believes diabetes causes. (Rosenstock, 1974).

*If an individual viewed the severity of a health problem in relation to the problems of medical consequences, that individual would demonstrate a concern for the his/her health status. However, another individual may have viewed the severity of a health problem through the disease's impact on social and role functions. An individual with diabetes for example, may not have perceived diabetes as a serious disease but may perceive diabetes as having a serious impact on psychological and economic aspects of living. The diabetics' perceptions of the severity of his/her disease may influence the way in which he/she adapts to the disease and adheres to a treatment regimen.*

#### Perceived benefits.

The action an individual takes was influenced by the individual's beliefs in the relative effectiveness of the available alternatives in decreasing the threat of the disease (Rosenstock, 1974). The individual's perceptions of the availability and effectiveness of different courses of action, not the objective facts in regards to effectiveness, determined the course of action (Rosenstock, 1974). Perceived benefits of preventive measures focused on the individual's belief in regards to the effectiveness of diabetic regimen and education in maintaining health, and lessening undesirable consequences of diabetes (Champion, 1984). The perceived benefits to preventive measures were influenced by norms and pressures of the individual's social groups (Rosenstock, 1974).

#### Perceived barriers.

Perceived barriers to preventive measures were the negative components restricting the diabetic regimen and education which would be undertaken to maintain health, and lessen unde-

sirable consequences of diabetes. (Champion, 1984). These negative aspects functioned as barriers to taking action and established conflicting motives of avoidance (Rosenstock, 1974). An individual may have perceived the preventive measures as beneficial, but simultaneously may have perceived the preventive measures as inconvenient, expensive, unpleasant, painful or upsetting (Rosenstock, 1974). Examples of barriers to the diabetic regimen included availability of preventive measures, monetary cost of preventive measures, time, inconvenience, need for new patterns of behavior, and effect on individual and family lifestyle (Champion, 1984; Hijeck, 1984).

#### Cues to action.

Cues to action were internal or external cues which provoke a conscious decision in the individual to act (Rosenstock, 1974). Cues were difficult to identify since they were often not remembered or fleeting in nature (Hijeck, 1984). Hijeck (1984) assumed that the stronger the perceived susceptibility to complications, severity of the disease, benefits of and barriers to preventive measures the less intense the cues needed to be to provoke action. An example of cues to action was family pressure. This study did not address cues to action as this concept has not been empirically tested.

The Health Belief Model viewed the role of demographic, soci-psychological, and structural variables as variables influencing the individual's perceptions (Rosenstock, 1974). The insulin dependent and non-insulin dependent diabetics' perceptions of the susceptibility to diabetic complications, severity of diabetes, and benefits of and barriers to preventive measures were assessed by the *Wortell's Diabetic Perception Scale (WDPS)*. The WDPS will be discussed in detail in chapter three.

### Statement of the Purpose

The purpose of this descriptive nursing research study was to describe the insulin dependent and non-insulin dependent diabetics' perceptions of susceptibility to diabetic complications, severity of diabetes, and benefits of and barriers to preventive measures. Specifically, the purpose of this research study was to answer the following research questions:

1. What are the perceptions of insulin dependent diabetics with regard to susceptibility to diabetic complications, severity of diabetes, and benefits of and barriers to preventive measures?
2. What are the perceptions of non-insulin dependent diabetics with regard to susceptibility to diabetic complications, severity of diabetes, and benefits of and barriers to preventive measures?
3. What are the differences, if any, between insulin dependent diabetics' and non-insulin dependent diabetics' perceptions of susceptibility to diabetic complications, severity of diabetes, and benefits of and barriers to preventive measures?

A secondary purpose of this study was to develop and test an instrument which identified the diabetic individuals' perceptions with regards to susceptibility to diabetic complications, severity of diabetes, benefits of and barriers to preventive measures.

### Summary

Diabetes mellitus is composed of two distinct types of diabetes: insulin dependent diabetes and non-insulin dependent diabetes. Both research and diabetic education programs have focused on the treatment of insulin dependent diabetics who comprise only five percent of the diabetic population in the United States (Marble, 1985). The goal of this study was to investigate the insulin dependent and non-insulin dependent diabetics' perceptions of susceptibility to diabetic complications, severity of diabetes, and benefits of and barriers to preventive measures. Findings of the study provided information on which a diabetic education program can be established.

## CHAPTER 2

### LITERATURE REVIEW

Using the present study's conceptual framework as a guide, research that investigated health beliefs and specifically health beliefs of individuals with diabetes mellitus was reviewed. The process included review of the literature in which the health belief model concepts were used and review of the research studies of diabetic health beliefs related to insulin dependent and non-insulin dependent diabetic studies. Results of the literature review will be addressed in this section.

#### Health Beliefs

Empirical research of the constructs in the health belief model supported the model's ability to assist in explaining and predicting a person's acceptance of preventive measures (Becker, 1974). The empirical research also established the need for further research of various health education strategies to modify health attitudes and subsequent behavior (Becker, 1974).

Research of the health belief model primarily focused on the original concepts: susceptibility, seriousness, benefits, and barriers (Champion, 1984). The four concepts, individually and in combination, have been tested as predictors of health related behaviors (Champion, 1984). The first major study using the health belief model concepts was conducted by Hochbaum in 1956. Hochbaum (1956) studied 1200 subjects to determine the factors which related to the decision to have voluntary chest x-rays for detection of tuberculosis. Hochbaum (1956) found 82% of the individuals who perceived personal susceptibility to tuberculosis and perceived the chest x-ray as beneficial had the chest x-rays taken. Of those individuals who believed in personal susceptibility but not in the benefits of the x-ray, 62% had the chest x-ray. Twenty-nine per-

cent of the individuals who perceived the chest x-ray as beneficial, but did not perceive personal susceptibility had the chest x-ray done. The study suggested that perceived susceptibility and perceived benefits were related to voluntary chest x-rays for tuberculosis. Hochbaum (1956) did not report reliability and validity of the instruments which were used in the study.

Kegeles' (1963) used the health belief model as the basis for his study of 430 subjects, which studied the individuals' perceived susceptibility, severity, benefits and barriers in relation to preventive dental visits. Data were collected from the subjects on a retrospective basis. Kegeles (1963) reported an increased number of preventive dental visits were made by individuals exhibiting all four health beliefs. As the number of health beliefs decreased, the number of preventive dental visits decreased. Further data were collected from the same subjects three years after the initial study (Kegeles, 1963). The second study showed perceived susceptibility and barriers were significantly ( $p \leq .05$ ) related to preventive dental visits. Instrument reliability and validity were not reported for either of Kegeles' studies in which the health belief model was used.

Becker, et al., (1978) studied mothers of asthmatic children (N=117) with regard to adherence to medication regimens. The study found medication adherence was significantly related ( $p \leq .05$ ) with perceived susceptibility to asthma attacks and benefits of the medication regimen. Validity and reliability of the instruments were again not reported.

Hijek (1984) developed a tool to identify the impact of the original four concepts in the health belief model, perceived susceptibility, severity, benefits of and barriers to preventative measures, on predicting patient entrance to a cardiac rehabilitation program. Hijek (1984) pilot tested the questionnaire with four acute myocardial infarction patients. No further testing of the instrument had been conducted at the time of this research report (T. W. Hijek, personal communication, February 24, 1987). Hijek (1984) reported content and construct validity. However, at the time of this report Hijek had not reported any further instrument validity or reliability (T. W. Hijek, personal communication, February 24, 1987).

Since 1952, the original constructs of the health belief model have been empirically

tested, yet methodological problems have plagued the research (Champion, 1984). The methodological problems identified by Champion (1984) included the following: tools not tested for validity or reliability; great variation in operational definitions; use of only one or two items to measure different perceptions; and operationalized tested concepts at a nominal level, limiting statistical analysis.

Champion (1984) indicated the major methodological problems in past research centered around instrument development. To provide a valid and reliable instrument to measure health belief model concepts, Champion (1984) developed a scale measuring the health belief model concepts in relation to breast self-examination.

#### Health Beliefs of Individuals with Diabetes Mellitus

"Behavioral research on patient compliance with regimens to manage diabetes have suffered from lack of conceptual rigor, although a handful of recent studies and reviews are more theoretically oriented" (Rosenstock, 1985, p.610). The research of diabetic health beliefs focused on the impact of the individual's health beliefs on adherence, or compliance, to diabetic regimens.

Rosenstock (1985) presented the health belief model along with the concept of perceived self-efficacy as a conceptual framework to explain diabetic compliance and describe approaches to enhance compliance to the diabetic regimen. Rosenstock (1985) stated the concept of self-efficacy, which referred to the individual's belief that he/she was capable of carrying out the health recommendation, should be added to the health belief model. Certain psychological dispositions including perceptions of threat to health, efficacy of recommended action, and knowledge of the illness and rationale for the regimen were associated with compliance to prescribed regimens, according to Rosenstock (1985). Rosenstock (1985) suggested diabetic research on compliance and interventions should incorporate the health belief model with the concept of self-efficacy.

Jenny's (1986) research on identifying differences of insulin dependent diabetic and

the non-insulin dependent diabetic adaptation to diabetes incorporated the health belief model into the conceptual framework. The emphasis of Jenny's (1986) study was on adaptation to the disease itself and not on health beliefs of the subjects. However, Jenny (1986) integrated the concepts of perceived severity, benefits, and barriers into her study of 246 diabetic subjects. Diabetic subjects were classified as insulin dependent if they were prescribed insulin, while the remainder of the subjects were classified as non-insulin dependent diabetics.

Jenny (1986) reported, through pilot testing of 35 clinic subjects, individuals attributed their noncompliance mainly to inconvenience, difficulty and lack of planning. The insulin dependent diabetics tended to score higher than non-insulin dependent diabetics in the areas of instructions received, perceived regimen benefits, social support, special concerns, and reported compliance with regimen. The insulin dependent diabetics' scores suggested that an increased perception of disease severity is associated with improved compliance, increased number of concerns, more instruction, increased perceived benefits of the regimen, and increased social support. The instrument developed by Jenny (1986) was judged to have face validity by a panel of experts, and reported internal reliability by Cronbach's alpha of 0.63.

#### Insulin Dependent Diabetics' Health Beliefs

Cerkoney, and Hart (1980) studied diabetics' compliance in relation to the health belief model concepts of perceived susceptibility, perceived severity, perceptions of benefits, barriers or cost, and cues. Compliance was assessed in the following areas of the diabetic regimen: insulin administration, diet, hypoglycemia, foot care, and urine testing. The study consisted of thirty subjects classified as "insulin treated", although 47% of the subjects had been on insulin for less than one year. Twenty-eight of the subjects had "adult onset" diabetes. Only three items measured each of the five health belief model concepts. Reliability of the instrument through test-retest was reported as 88.6%. Cerkoney, and Hart (1980) did not report any further reliability or validity information.

Cerkoney, and Hart (1980) reported diabetics who perceived their disease as serious and responded to cues tended to be more compliant with the diabetic regimen than diabetics without these perceptions. Twenty-eight out of the thirty diabetics studied perceived their treatment as beneficial, but considered their "treatment" to only consist of taking insulin. The study was limited as the population included only "insulin treated" diabetics.

Schafer, McCaul, and Glasgow (1986) studied the effects of supportive and nonsupportive family behaviors of the adherence and glycemic control of insulin dependent diabetics. The Diabetes Family Behavior Checklist was used to assess the family behaviors that may support or interfere with the diabetic regimen in four areas: insulin injection, glucose testing, diet, and exercise (Schafer, McCaul, & Glasgow, 1986). Eighteen adolescents and 54 adults participated in the study (Schafer, McCaul, & Glasgow, 1986). Findings suggested that adolescents and their family members perceived negative, nonsupportive, family behaviors occurring more frequently than did adults and their family members. Cronbach's alpha was used to assess internal consistency on the Diabetes Family Behavior Checklist and ranged from 0.43 to 0.95 (Schafer, McCaul, & Glasgow, 1986).

#### Non-Insulin Dependent Diabetics' Health Beliefs

Wilson, et al., (1986) studied the psychosocial predictors of self-care behaviors and glycemic control in non-insulin dependent diabetics. Non-insulin dependent diabetics were distinguished from insulin dependent diabetics on the basis of age at onset, relative weight, and amount of time between diagnosis and treatment with insulin. One hundred eighty four subjects were included in the study. Diabetes-specific psychosocial measures studied were knowledge, health beliefs, and social support. The diabetics' health beliefs were assessed in the areas of effectiveness, discomfort, and life-style interference, which corresponded to perceived benefits of and barriers to preventive measures. Wilson, et al. (1986), reported health beliefs of the diabetics' were more predictive of adherence to self-care behaviors than social support, knowledge, anxie-

ty, and depression. Validity and reliability of the instruments used in Wilson's, et al. (1986) study were not reported.

#### Summary

The goal of this study was to identify the insulin dependent diabetic and non-insulin dependent diabetics' perceptions of susceptibility to diabetic complications, severity of diabetes, and benefits of and barriers to preventive measures and the relationship among the perceptions. Studies from the health belief literature were reviewed in this chapter and supported the need for research with consistent classification of diabetics, consistent definitions of health belief concepts, and development of tools which are valid and reliable measures of diabetic health beliefs.

## CHAPTER 3 METHODOLOGY

The methodology used in the study is delineated in the following section. The design, setting, study sample, operational definitions, and procedure for protection of human subjects are described. The method of data collection, instrument development, and statistical analysis are also discussed.

### Design

This study used a descriptive design. The perceptions of insulin dependent and non-insulin dependent diabetics in relation to susceptibility to diabetic complications, severity of diabetes, and benefits of and barriers to preventive measures were obtained through a questionnaire.

### Setting

The setting for the study was a private physician's office. The private physician was an endocrinologist with a patient population which consisted of approximately 40-50% diabetics.

### Sample

The study's convenience sample of 71 subjects, 43% classified as insulin dependent diabetics and 57% classified as non-insulin dependent diabetics, consisted of individuals who met the following criteria

1. Minimum of 18 years of age.
2. A medical diagnosis of insulin dependent or non-insulin dependent diabetes.
3. Diagnosed with diabetes at least one year ago.
4. Ability to read and write English.

Although, individuals may have been diagnosed with diabetes before the age of 18, diabetics under the age of 18 were excluded from the study. Parental consent would have to be obtained for diabetics under the age of 18.

### Operational Definitions

For the purpose of this study, the following operational definitions were used:

1. **Insulin dependent diabetic:** An individual who met the following criteria: 1) diagnosed with diabetes and, 2) treated initially and thereafter with insulin.
2. **Non-insulin dependent diabetic:** An individual who met the following criteria: 1) diagnosed with diabetes, 2) treated initially with diet and/or oral hypoglycemic agents, and 3) not treated with insulin within one year of diagnosis (Laakso, & Pyorala, 1985).
3. **Health beliefs:** In this study, health beliefs were a composite of the diabetics' perceptions of susceptibility to diabetic complications, severity of diabetes, benefits of and barriers to preventive measures, as measured by the Wortell Diabetic Perception Scale.
4. **Perceptions:** In this study, the subjects' perceptions were measured by their responses on the WDPS to the process of being aware of the susceptibility to diabetic complications, severity of diabetes, benefits of and barriers to preventive measures.
5. **Perceived severity of diabetes:** In this study, perceived severity of the illness was measured by the perceived severity scale on the WDPS which indicated the individual's awareness of "harmful consequences of the condition in relation to altering personal physical health, role, social status, and ability to complete desired tasks" (Champion, 1984, p.77).
6. **Perceived susceptibility to diabetic complications:** In this study, perceived sus-

ceptibility to diabetic complications was measured by the perceived susceptibility to diabetic complications scale on the WDPS which indicated the individual's belief of subjective risks of contracting a complication of diabetes within a specified time period. (Champion, 1984; Hijeck, 1984; Rosenstock, 1974).

7. Preventive measures: In this study, preventive measures referred to the diabetic regimen and education which would be undertaken to maintain health, and lessen undesirable consequences of diabetes (Champion, 1984).
8. Perceived benefits of preventive measures: In this study, perceived benefits of preventive measures were measured by the perceived benefits of preventive measures scale on the WDPS which indicated the individual's awareness of the availability and effectiveness of the alternatives in decreasing the threat of the disease (Rosenstock, 1974).
9. Perceived barriers to preventive measures: In this study, perceived barriers to preventive measures were measured by the perceived barriers to preventive measures scale on the WDPS which indicated the individual's awareness of negative components which restrict the availability and effectiveness of the alternatives in decreasing the threat of the disease (Champion, 1984; Rosenstock, 1974).

#### Protection of Human Subjects

Approval was obtained for the study from the College of Nursing Human Subjects Committee (Appendix A). The private physician also gave personal approval for conducting the study in the setting (Appendix B).

Each subject was informed that his/her identity and questionnaire responses would remain confidential throughout the study. No names were used on the research forms or questionnaires and all responses were destroyed after the data were collected and analyzed. A copy of the study disclaimer is shown in Appendix C.

### Method of Data Collection

Data were collected during a five week period from June through July, 1987. Subjects were informed of the study through their primary physician and the researcher. If they agreed to participate in the study, data were collected during waiting periods at the physician's office. Written instructions were provided and the researcher was available to answer any questions. The subjects completed the Wortell Diabetic Perception Scale (WDPS) (sample questions in Appendix D). Information was also obtained from the subjects regarding type of diabetes, length of time since diagnosis, formal diabetic education, and related demographic data (Appendix E).

### Tool Development and Design

The *Wortell Diabetic Perception Scale* was developed specifically for this study. The questionnaire consisted of two parts. The first section of the questionnaire was developed to collect data on the diabetic's perceptions regarding the susceptibility to diabetic complications, severity of diabetes, and benefits of and barriers to preventive measures. The tool was modified from the questionnaire developed by Hijeck (1984) which was used to predict patient entrance to a cardiac rehabilitation program. Hijeck (1984) reported content and construct validity; however, he did not report any further instrument validity or reliability. Permission was received from T. W. Hijeck and W. B. Saunders Company to modify the tool for this study (Appendix E).

The original questionnaire by Hijeck (1984) was a seven point Likert-type scale. However, Hijeck's questionnaire was modified to a five point Likert-type scale for this study to allow the participant to choose from two positive, two negative, and one neutral answer for each question. The seven point Likert-type scale increased the options to three positive and three negative responses, which may contribute to confusion in the respondent. (Polit & Hungler, 1983).

The original questionnaire (Hijeck, 1984) was modified for this study to apply to the diabetic population in relation to health beliefs of insulin dependent and non-insulin dependent diabetics. Questions were developed from personal experience with diabetic individuals and on the ba-

sis of an extensive literature review. The items were categorized into the following subscales:

- |    |  |         |
|----|--|---------|
| 1. | Susceptibility to diabetic complications | 5 items |
| 2. | Severity of diabetes                     | 7 items |
| 3. | Benefits of preventive measures          | 5 items |
| 4. | Barriers to preventive measures          | 9 items |

The twenty six item questionnaire was administered to each subject. Question number one, a perceived susceptibility to diabetic complications subscale item, and question number eight, a perceived severity subscale item, were not reliable ( $r = -.34$  and  $r = -.23$ , respectively). Therefore, these two questions were deleted. The statistical analysis was based on the revised 24 item questionnaire.

The second section of the questionnaire, recorded demographic information on the diabetic subjects. This section included the following information

1. Whether or not presently taking insulin
2. Whether or not prescribed insulin within one year of diagnosis
3. Length of time since diagnosis
4. History of diabetes in the family
5. Sex
6. Age
7. Marital Status
8. Employment status (Presently working or not working)
9. Income status
10. Whether or not attended a diabetic class in the past
11. Sources of diabetic information

The demographic information was collected primarily to describe the study sample. The data on the type of diabetes was used to differentiate the perceptions of the insulin dependent di-

abetic and the non-insulin dependent diabetic. Data on employment status, as well as income status, was analyzed in relation to the diabetics' perceived severity of diabetes and barriers to preventive measures.

To establish content validity of the items and the complete scale the researcher followed Lynn's (1986) suggested process for content validity. The first stage of instrument development included: identification of all dimensions and subdimensions with regards to diabetic health beliefs through a thorough literature review; generation of items for all identified dimensions and subdimensions; and assembling items into a usable form (Lynn, 1986). During the judgement-quantification stage, content validity for the items and the instrument was judged by a panel of three experts. The experts were nurses with an expert knowledge in the area of diabetes and medical-surgical nursing. Specific instructions were provided to the panel of experts to determine the content relevance of each item and the instrument (Lynn, 1986) (Appendix F). The panel of experts was also asked to identify any areas omitted from the instrument (Lynn, 1986).

#### Statistical Analysis of Data

The purpose of the statistical analysis was to determine the difference, if any, between insulin dependent diabetic's and non-insulin dependent diabetic's perceptions of susceptibility to diabetic complications, severity of diabetes, and benefits of and barriers to preventive measures. Descriptive statistics were used to describe the study's sample of insulin dependent and non-insulin dependent diabetics. Frequency, percentages distributions, means, and standard deviations were computed from the data obtained from the demographic section of the questionnaire. Internal consistency of the instrument was measured by coefficient alpha within the subscales and the total scale.

The following statistical methods were utilized in order to answer research question one: What are the perceptions of insulin dependent diabetics with regard to susceptibility to diabetic complications, severity of diabetes, and benefits of and barriers to preventive measures? The

sums of the scores for each question were tallied and the means computed. The means for each of the four subscales and the total scale were computed. The Pearson product moment correlation coefficient was used to summarize the magnitude and direction of the relationships between the demographic variables and the variables of perceived susceptibility to diabetic complications, severity of diabetes, and benefits of and barriers to preventive measures.

The following statistical methods were utilized in order to answer research question two: What are the perceptions of non-insulin dependent diabetics with regard to perceived susceptibility to diabetic complications, severity of diabetes, and benefits of and barriers to preventive measures? The sums of the scores for each question were tallied and the means computed. The means for each of the four subscales and the total scale were computed. The Pearson product moment correlation coefficient was used to summarize the magnitude and direction of the relationships between the demographic variables and the variables of perceived susceptibility to diabetic complications, severity of diabetes, and benefits of and barriers to preventive measures.

The following statistical methods were utilized in order to answer research question three: What are the differences, if any, between insulin dependent diabetics' and non-insulin dependent diabetics' perceptions of susceptibility to diabetic complications, severity of diabetes, and benefits of and barriers to preventive measures? The combined means of the insulin dependent and non-insulin dependent diabetics' scores along with the item to total scale correlations were calculated. To determine if there was a statistical difference in the mean scores of the four subscales and the total scale, between the insulin dependent and non-insulin dependent diabetic, *t* - tests were utilized.

### Summary

The study methodology outlined the study's design, setting, sample, operational definitions, protection of human subjects, data collection, tool development, and statistical analysis.

The study sample consisted of insulin dependent (43%) and non-insulin dependent diabetics (57%) from one setting.

Operational definitions were given to provide consistent definitions of the concepts in the study. The proposed data collection and statistical analysis were outlined which will describe the health beliefs of the insulin dependent and non-insulin dependent diabetic and the relationship among the perceptions.

## CHAPTER 4

### PRESENTATION OF DATA

The purpose of this study was to describe the insulin dependent and non-insulin dependent diabetics' perceptions with regards to susceptibility to diabetic complications, severity of diabetes, and benefits of and barriers to preventive measures. This chapter presents findings related to the characteristics of the sample, instrument reliability, and results of the analysis of data.

The Wortell Diabetic Perception Scale (WDPS) was used to collect the data for this study. The first part of the WDPS consisted of 26 items concerning the diabetics' perceptions of susceptibility to diabetic complications, severity of diabetes, and benefits of and barriers to preventive measures. The second part of the WDPS consisted of questions related to eleven demographic variables.

#### Description of the Sample

The sample consisted of 71 subjects diagnosed with Diabetes Mellitus. Data were collected at a private physician's office visits while the subjects were waiting for their appointment with the physician. Most subjects completed the questionnaire within a ten minute time span.

One subject currently was not prescribed insulin but was prescribed insulin within the first year of diagnosis. Due to the unusual insulin characteristics this subject was treated as a special case in several statistical calculations related to the categorization of insulin dependent diabetics and non-insulin dependent diabetics. Therefore, the tables which differentiate between insulin dependent diabetics and non-insulin dependent diabetics have 70 subjects, while the remainder of the tables have 71 subjects.

Table 1. Description of Sample by Age, Sex, Marital Status, Employment Status, and Income (N=70)

	Insulin dependent		Non-insulin dependent	
	diabetic (n=30)		diabetic (n=40)	
	n *	% *	n *	% *
<b>Age</b>				
20-30 years	6	19.8	2	5.0
40-59 years	5	16.6	7	17.5
60-80 years	19	63.6	27	67.5
<b>Sex</b>				
Male	12	40.0	25	62.5
Female	18	60.0	15	37.5
<b>Marital Status</b>				
Married	22	73.3	28	70.0
Single	4	13.3	2	5.0
Divorce	2	6.7	3	7.5
Widowed	2	6.7	7	17.5
<b>Employment Status</b>				
Working	6	20.0	10	25.0
Not working	21	70.0	35	87.5
<b>Income</b>				
\$10,000 or less	6	20.0	10	25.0
\$11,000-20,000	8	26.7	7	17.5
\$21,000-30,000	3	10.0	12	30.0
\$31,000 or more	5	16.7	5	12.5

\* Total may not sum to N due to missing data.

Data which describe the sample by age, sex, marital status, employment status, and income are presented in Table 1. The subjects' ages ranged from 22 to 80, with a mean age of 60.6 years (s.d.=14.19). The majority of the insulin dependent diabetics (64%) and non-insulin dependent diabetics (68%) were sixty years of age and older. Females composed the majority of the insulin dependent diabetics (60%), while males composed the majority of the non-insulin dependent diabetics (63%). The majority of both the insulin dependent diabetics (73%) and non-insulin dependent diabetics (70%) reported being married. Seventy percent of the insulin dependent diabetics and 80% of the non-insulin dependent diabetics were not presently employed. The subjects were fairly evenly distributed among the four income categories although 20% of the insulin dependent diabetics and 25% of the non-insulin dependent diabetics reported incomes below \$10,000.

A description of the sample in relation to the prescription of insulin is presented in Table 2. Of the 71 diabetic subjects surveyed, 54 (76%) were currently taking insulin, and 31 (44%) of those were prescribed insulin within the first year of their diagnosis of diabetes. According to this study's operational definitions, the diabetics who were prescribed insulin within the first year of their diagnosis and were currently prescribed insulin were classified as insulin dependent diabetics. Therefore, thirty (43%) of the subjects were classified as insulin dependent diabetics and forty (57%) were classified as non-insulin dependent. For this study, the one subject who was prescribed insulin within the first year and was not currently prescribed insulin was not classified as either an insulin dependent or non-insulin dependent diabetic.

Data related to the characteristics of the subjects by time since diagnosis, family history, and diabetic class attendance are presented in Table 3. The majority (77%) of the insulin dependent diabetics and the majority (85%) of the non-insulin dependent diabetics reported being diagnosed with diabetes more than five years ago. Only three of the subjects reported being diagnosed with diabetes within the past two years. Nineteen (63%) of the insulin dependent diabetics

**Table 2. Characteristics of Subjects by Prescription of Insulin (N=71)**

<b>Prescription of Insulin</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Taking insulin</b>		
<b>Yes</b>	<b>54</b>	<b>76.1</b>
<b>No</b>	<b>17</b>	<b>23.9</b>
<b>Prescribed insulin within first year of diagnosis</b>		
<b>Yes</b>	<b>31</b>	<b>43.7</b>
<b>No</b>	<b>40</b>	<b>56.3</b>

reported having a family history of diabetes, while 25 (63%) of the non-insulin dependent diabetics reported having a family history of diabetes.

Subjects were asked if they had attended diabetic classes in the past. The majority of the insulin dependent diabetics (67%) reported attending a diabetic class, while only 18 (45%) of the non-insulin dependent diabetics reported attending a diabetic class.

Subjects were asked to check any of eight sources from which they had received diabetic information. The eight categories of diabetic information were friends, family, newspapers/magazines, diabetic newsletters, nurses, dieticians, doctors, and other sources. The data related to sources of diabetic information are presented in Table 4. The majority of the diabetics received diabetic information from doctors (93%) and dieticians (66%). Slightly more than half of the subjects reported receiving diabetic information from nurses (54%), diabetic newsletters (55%), and newspapers/magazines (51%). Ten of the subjects received diabetic information classified in the "other" category which included the following: diabetic association (4%), Joslin's Diabetic Clinic (3%), personal health care professional education (3%), physical therapist (1%), television (1%), and books/cassettes (1%).

Several subjects provided additional verbal information to the researcher in regards to their perceptions of diabetes. These comments included feelings of anger, resentment, and discouragement toward the disease of diabetes. These may be classified as perceived barriers to preventive measures.

**Table 3. Characteristics of Subjects by Time Since Diagnosis, Family History, and Diabetic Class Attendance (N=70)**

	Insulin dependent diabetics (n = 30)		Non-insulin dependent diabetics (n = 40)	
	n	%	n	%
Time since diagnosis				
1-2 years	2	6.7	1	2.5
3-5 years	5	16.7	5	12.5
more than 5 years	23	76.7	34	85.0
Family History of Diabetes	19	63.3	25	62.5
Attended Diabetic Class	20	66.7	18	45.0

Table 4. Characteristics of Subjects by Diabetic Information Sources (N=71)

Diabetic Information Source	Frequency*	Percent*
Friends	11	15.5
Family	22	31.0
Newspapers/Magazines	36	50.7
Diabetic Newsletters	39	54.9
Nurses	38	53.5
Dieticians	47	66.2
Doctors	66	93.0
Other	10	14.1

\* Subjects obtained information from multiple sources.

### Analysis of Instrument Reliability

The Wortell Diabetic Perception Scale (WDPS) was developed by Wortell through an extensive literature review and personal clinical nursing experience with diabetic patients. The WDPS utilized four components of the Health Belief Model: susceptibility to diabetic complications, severity of diabetes, benefits of preventive measures, and barriers to preventive measures. Subjects were asked to respond to items related to the four Health Belief components.

Content validity of the WDPS was established according to the process suggested by Lynn (1986). Instrument development included identifying all dimensions and subdimensions of information related to diabetic health beliefs through a thorough literature review, generating items for all identified dimensions and subdimensions, and assembling items into a usable form (Lynn, 1986). The second phase of instrument development was the judgement-justification stage (Lynn, 1986) in which a panel of three nurses with an expert knowledge in the area of diabetes judged each item, and the total scale, for relevance and clarity. Specific instructions were provided to the panel of experts (Appendix F). Relevance was determined on a scale of one to four with four being extremely relevant and one being irrelevant. Each item was rated as extremely relevant by the three nurse experts except item number one which was rated, by one judge, as a three, needing clarification. The judges provided input on clarification of several items, but suggested that all items be retained. Therefore, the instrument's content validity was established by literature review, generation of items, assembling items into usable form, and judgement by an expert panel (Lynn, 1986).

Internal consistency of the total scale and subscales was measured by standardized coefficient alphas. The item to total scale correlations are presented in Table 6. Two unreliable questions were deleted from the questionnaire administered to the subjects. The statistical analysis therefore was based on the revised 24 item questionnaire. Reliability estimates for the total instrument and subscales of the WDPS are presented in Table 5. The total scale standardized coefficient alpha was 0.82 and the subscale standardized coefficient alphas ranged from 0.62 to 0.72.

### Analysis of Data

The purpose of this study was to answer the following three research questions. Each question is discussed in detail in this section.

#### Research Question 1

The first research question of this study was: What are the perceptions of insulin dependent diabetics with regard to susceptibility to diabetic complications, severity of diabetes, and benefits of and barriers to preventive measures? Each of the 30 insulin dependent diabetics was given a 26-item questionnaire and asked to respond to each question. The data were compiled on 24 items, with questions one and eight deleted. Each question had five possible scores from 1 to 5 with one being the most negative response and five being the most positive response. The anchors for each question varied according to the stem of the question (Appendix D).

The sums of the scores for each question were tallied and the means computed. The mean scores for each item are presented in Table 6. The insulin dependent diabetics' mean scores ranged from 2.46 to 4.97. The means for each of the four subscales and the total scale were then calculated and are presented in Table 7. The insulin dependent diabetics' total scale mean was 92.24, with subscale means ranging from 16.80 for perceived susceptibility to 32.43 for perceived barriers.

Correlation statistics using Pearson product moment correlation coefficient were calculated to identify the relationships among the demographic variables. Table 8 presents the Pearson product moment correlation coefficient matrix of the demographic variables. Since the WDPS was a newly developed instrument, the probability levels were designated at both the 0.05 and 0.10 levels.

A statistically significant relationship was found to exist among the following demographic variables: prescription of insulin and prescription of insulin within the first year of diagnosis; age and prescription of insulin, insulin within first year of diagnosis, and family history; marital status

Table 5. Reliability Estimates for Total Instrument and Subscales of the WDPS

Subscale # and Name	# of Items on Subscale	Item Mean	Standardized Coefficient Alpha
I. Suseceptibility to Diabetic Complications	4	4.12	0.62
II. Severity of Diabetes	6	3.61	0.72
III. Benefits of Preventive Measures	5	4.04	0.71
IV. Barriers to Preventive Measures	9	3.68	0.72
Total Scale	24	3.81	0.82

Table 6. Item Means and Item-to-Total Scale Correlations (N=70)

Item Number	Insulin Dependent Diabetics (n=30)	Non-insulin Dependent (n=40)	Combined (N=70)	
	Mean	Mean	Mean	r
*1	1.52	1.58	1.59	-.3437
2	4.97	4.68	4.85	.2496
3	4.07	3.56	3.75	.4024
4	3.67	3.47	3.50	.4687
5	4.10	4.40	4.34	.2277
6	4.23	3.85	4.08	.3613
7	3.33	2.93	3.05	.0402
*8	3.00	3.68	3.41	-.2299
9	3.97	3.48	3.67	.6964
10	3.07	2.54	2.75	.6078
11	4.00	3.67	3.77	.5900
12	4.40	4.28	4.32	.3234
13	4.33	4.00	4.12	.4691
14	4.07	4.13	4.14	.4183
15	4.45	4.22	4.31	.5600
16	3.93	3.72	3.78	.5082
17	3.79	3.73	3.83	.3336
18	4.21	4.32	4.21	.3996
19	3.27	3.23	3.21	.3648
20	2.46	2.59	2.64	.3377
21	4.53	4.49	4.51	.2881
22	4.17	4.15	4.11	.5910
23	3.70	3.13	3.43	.1014
24	3.33	3.53	3.40	.6143
25	4.00	4.17	4.11	.4025
26	3.57	3.33	3.47	.3545

\*Deleted

Table 7. Comparison of Insulin Dependent Diabetics(IDD) and Non-insulin Dependent Diabetics (NIDD) Perceptions by Sub-scales (N=70)

Subscale	Mean	s.d.	df	t-value	2-tail probability
Perceived susceptibility					
IDD (n=30)**	16.80	2.78			
NIDD (n=40)**	15.85	4.26	68	1.06	0.29
Perceived severity					
IDD (n=29)**	22.90	4.49			
NIDD (n=36)**	20.58	5.10	63	1.92	0.06*
Perceived benefits					
IDD (n=30)**	20.17	3.88			
NIDD (n=39)**	19.00	5.31	67	1.01	0.31
Perceived barriers					
IDD (n=30)**	32.43	5.57			
NIDD (n=39)**	31.38	6.14	67	0.73	0.46
TOTAL SCALE					
IDD(n=29)**	92.24	11.04			
NIDD (n=35)**	87.77	14.89	62	1.34	0.185

\* significant if  $p \leq 0.05$

\*\* Total may not sum to N due to missing data.

Table 8. Pearson Product Moment Correlation Coefficient Matrix of the Demographic Variables (N= 71)

	Prescribed Insulin	Insulin Within First Year	Time Since Diagnosis	Family History	Sex	Age	Marital Status	Employment Status	Income	Diabetic Class Attendance
Prescribed Insulin	1.00									
Insulin Within First Year	.4274 (p=.000)*	1.00								
Time Since Diagnosis	-.1406 (p=.242)	.1124 (p=.351)	1.00							
Family History	-.0316 (p=.794)	-.0124 (p=.919)	-.0522 (p=.666)	1.00						
Sex	-.0224 (p=.853)	-.1125 (p=.350)	.0439 (p=.716)	.0682 (p=.572)	1.00					
Age	.2018 (p=.101)**	.2371 (p=.053)**	-.1841 (p=.136)	.2933 (p=.016)*	-0.999 (p=.421)	1.00				
Marital Status	.2392 (p=.045)*	.0795 (p=.510)	-.0661 (p=.584)	.0134 (p=.912)	.1987 (p=.097)**	.3367 (p=.005)*	1.00			
Employment Status	-.0537 (p=.656)	.2061 (p=.085)**	-.1499 (p=.212)	.0236 (p=.845)	.0491 (p=.684)	.4286 (p=.000)*	.1629 (p=.175)	1.00		
Income	-.2119 (p=.114)	.0419 (p=.757)	.2362 (p=.077)**	.1596 (p=.236)	-.1564 (p=.245)	-.1234 (p=.374)	-.3853 (p=.003)*	-.2285 (p=.087)**	1.00	
Diabetic Class Attendance	.3374 (p=.004)*	.1941 (p=.105)**	.0242 (p=.841)	-.1483 (p=.217)	.0496 (p=.681)	.0995 (p=.423)	.2978 (p=.012)*	-.1060 (p=.379)	-.0520 (p=.701)	1.00

\*significant if  $p \leq 0.05$

\*\*significant if  $p \leq 0.10$

and prescription of insulin, sex, and age; employment status and insulin within the first year of diagnosis and age; income status and time since diagnosis, marital status, and employment status; diabetic class attendance and prescription of insulin, insulin within first year of diagnosis, and marital status.

In addition, Pearson product moment correlation coefficient was used to summarize the magnitude and direction of the relationships between the demographic variables and the four subscales: perceived susceptibility to diabetic complications, severity of diabetes, and benefits of and barriers to preventive measures. Table 9 presents Pearson product moment correlation coefficient matrix of the demographic variables and subscales.

Statistically significant relationships were found to exist between the following demographic variables and subscales: prescription of insulin and perceived susceptibility, and perceived severity; prescription of insulin within the first year of diagnosis and perceived severity; sex and perceived benefits; age and perceived benefits, perceived barriers, and the total scale; and income and perceived severity and the total scale.

#### Research Question 2

The second research question of this study was: What are the perceptions of non-insulin dependent diabetics with regard to susceptibility to diabetic complications, severity of diabetes, and benefits of and barriers to preventive measures? Each of the 40 non-insulin dependent diabetics was asked to respond to the 26 item questionnaire. The data were compiled on 24 items with questions one and eight deleted. Each of the questions had a five possible scores from one to five with one being the most negative response and five being the most positive response. The anchors for each question varied according to the stem of the question (Appendix D).

The sums of the scores for each question were tallied and the means computed. The non-insulin dependent diabetics' mean scores for each item on the instrument are given in Table

Table 9. Pearson Product Moment Correlation Coefficient Matrix of the Demographic Variables and Subscales (N=71)

	Perceived Susceptibility	Perceived Severity	Perceived Benefits	Perceived Barriers	Total Scale
Prescribed Insulin	-.3698 (p=.002)*	-.2430 (p=.049)*	-.0162 (p=.894)	.0562 (p=.662)	-.0964 (p=.445)
Insulin Within First Year	-.1068 (p=.375)	-.2370 (p=.055)**	-.1234 (p=.309)	-.1044 (p=.390)	-.1701 (p=.175)
Time Since Deagnosis	.1136 (p=.345)	.0301 (p=.810)	-.0260 (p=.831)	.0471 (p=.699)	.0568 (p=.653)
Family History	-.0418 (p=.729)	-.1414 (p=.258)	-.1060 (p=.382)	-.1222 (p=.314)	-.1373 (p=.276)
Sex	.0407 (p=.736)	.0357 (p=.776)	.2150 (p=.074)**	.1361 (p=.261)	.1853 (p=.140)
Age	-.0841 (p=.499)	-.0346 (p=.789)	-.3616 (p=.003)*	-.3332 (p=.006)*	-.2737 (p=.033)*
Marital Status	-.0626 (p=.604)	-.0082 (p=.948)	-.1840 (p=.127)	-.1206 (p=.320)	-.0794 (p=.530)
Employment Status	-.0265 (p=.827)	-.0352 (p=.779)	-.1361 (p=.261)	.0000 (p=1.00)	-.0567 (p=.654)
Income	-.1255 (p=.352)	-.3294 (p=.017)*	-.1751 (p=.197)	-.0763 (p=.573)	-.3106 (p=.025)*
Diabetic Class Attendance	.0192 (p=.874)	.1389 (p=.266)	-.0580 (p=.633)	.0603 (p=.620)	.0811 (p=.521)

\* Significant if  $p < 0.05$

\*\* Significant if  $p < 0.10$

6. The means ranged from 2.45 to 4.68. The means for each of the four subscales and the total scale were then calculated and are given in Table 7. The non-insulin dependent diabetics' total scale mean was 87.77, with the subscale means ranging from 15.85 for perceived susceptibility to 31.38 for perceived barriers.

Correlation statistics using Pearson product moment correlation coefficient were calculated to identify the relationships among the demographic variables. Table 8 presents Pearson product moment correlation coefficient matrix for the demographic variables. Since the WDPS was a newly developed instrument, the probability levels were designated at both the 0.05 and 0.10 levels.

A statistically significant relationship was found to exist among the following demographic variables: prescription of insulin and prescription of insulin within the first year of diagnosis; age and prescription of insulin, insulin within first year of diagnosis, and family history; marital status and prescription of insulin, sex, and age; employment status and insulin within first year of diagnosis and age; income status and time since diagnosis, marital status, and employment status; diabetic class attendance and prescription of insulin, insulin within first year of diagnosis, and marital status.

In addition, Pearson product moment correlation coefficient was used to summarize the magnitude and direction of the relationships between the demographic variables and the four subscales: perceived susceptibility to diabetic complications, severity of diabetes, and benefits of and barriers to preventive measures. Table 9 presents Pearson product moment correlation coefficient matrix of the demographic variables and subscales.

Statistically significant relationships were found to exist between the following demographic variables and subscales: prescription of insulin and perceived susceptibility, and perceived severity; prescription of insulin within the first year of diagnosis and perceived severity; sex and perceived benefits; age and perceived benefits, perceived barriers, and the total scale; and

income and perceived severity, and the total scale.

### Research Question 3

The third research question of this study was: What are the differences, if any, between insulin dependent diabetics' and non-insulin dependent diabetics' perceptions of susceptibility to diabetic complications, severity of diabetes, and benefits of and barriers to preventive measures? The combined item means of the insulin dependent and non-insulin dependent diabetics' scores along with the item to total scale correlations for each item are presented in Table 6. Two unreliable items were deleted, and the statistical analysis is based on 24 items. The combined item means ranged from 2.64 to 4.85. The range of the item to total scale correlations was .0402 to .6964.

To determine if there was a statistical difference in the magnitude of the mean scores of the four subscales and the total scale, between perceptions of the insulin dependent and non-insulin dependent diabetic, two-tailed *t*-tests were performed. Results of the *t*-tests are presented in Table 7. A statistically significant difference was found to exist between the insulin dependent diabetics' perception of severity of diabetes and the non-insulin dependent diabetics' perception of severity of diabetes. The insulin dependent diabetics' and non-insulin dependent diabetics' perceptions of susceptibility to diabetic complications, benefits of preventive measures, and barriers to preventive measures were found not to be significantly different.

### Summary

Seventy-one individuals with a diagnosis of diabetes mellitus participated in the study designed to describe the insulin dependent and non-insulin dependent diabetics' perceptions of susceptibility to diabetic complications, severity of diabetes, and benefits of and barriers to preventive measures. Each subject completed the Wortell Diabetic Perception Scale. This chapter

presented findings related to the characteristics of the sample, instrument reliability, and results of the analysis of data.

Content validity of the WDPS was established through a thorough literature review and judgement by a panel of nurse experts. Internal consistency of the WDPS was measured by coefficient standardized alpha. Two unreliable items were deleted from the 26 item scale for data analysis. Pearson product moment correlation coefficient was used to describe the magnitude and direction of the relationships among the demographic variables and between the demographic variables and the variables of perceived susceptibility to diabetic complications, severity of diabetes, benefits of and barriers to preventive measures. The significant relationships among demographic variables and between demographic variables and subscales were identified.

To determine the statistical difference between the insulin dependent and non-insulin dependent diabetics', mean scores for the subscales and the total scale were calculated, and two-tailed *t*-tests were utilized. A statistically significant difference was found to exist between the insulin dependent diabetics' perception of severity of diabetes and the non-insulin dependent diabetics' perception of severity of diabetes. The data did not support any significant statistical differences between the insulin dependent and non-insulin dependent diabetics perceptions of susceptibility to diabetic complications, benefits of preventive measures, and barriers to preventive measures.

## CHAPTER 5

### DISCUSSIONS AND CONCLUSIONS

The purpose of this descriptive nursing research study was to describe the insulin dependent diabetics' and non-insulin dependent diabetics' perceptions with regard to susceptibility to diabetic complications, severity of diabetes, and benefits of and barriers to preventive measures. This chapter presents a discussion of the findings, conclusions, limitations, recommendations for future research, and implications for nursing practice.

The conceptual framework of this study proposed to describe the insulin dependent diabetics and non-insulin dependent diabetics with regard to perceptions of susceptibility to diabetic complications, severity of diabetes, and benefits of and barriers to preventive measures. The direction and relationship between insulin dependent diabetics' and non-insulin dependent diabetics' perceptions of severity of diabetes was found to be significantly different.

Data relating to eleven demographic variables were collected. Data were also collected through the use of the Wortell Diabetic Perception Scale (WDPS). The WDPS was administered to 71 diabetics in a private physician's office. The WDPS consisted of 26 items concerning the diabetics' perceptions of susceptibility to diabetic complications, severity of diabetes, and benefits of and barriers to preventive measures. Two unreliable items were deleted. Data were analyzed using the revised 24 item scale.

#### Findings

##### Demographic Variables

Correlation statistics using the Pearson product moment correlation coefficient were cal-

culated to identify the relationships among the demographic variables. For convenience for the reader the study's coding dictionary is in Appendix G. The probability levels were designated at both the 0.05 and 0.10 levels since the WDPS was a newly developed instrument.

The prescription of insulin within the first year of diagnosis was significantly related to the current prescription of insulin ( $r=.4274$ ,  $p=.000$ ). This was an expected relationship. The subjects not currently prescribed insulin were not prescribed insulin within the first year of diagnosis.

A significant relationship was found to exist between age and the current prescription of insulin ( $r=.2018$ ,  $p=.101$ ). The older subjects were not currently prescribed insulin. Age was also significantly related to the prescription of insulin within the first year of diagnosis of diabetes ( $r=.2371$ ,  $p=.053$ ). The older subjects were not prescribed insulin within the first year of diagnosis. These two findings were consistent with the increased occurrence of non-insulin dependent diabetics above the age of 65 (Laakso, & Pyorala, 1985). Marble, et al., (1985) stated the majority of diabetics are over the age of 40 and are mostly non-insulin dependent diabetics, which was consistent with this study's findings.

Age was also significantly related to the family history of diabetes ( $r=.2933$ ,  $p=.016$ ). Older subjects did not have a known family history of diabetes. Since the majority (66%) of the sample were over 60 years of age, diabetes in the family may have been present but not diagnosed.

A significant relationship was found to exist between marital status and the current prescription of insulin ( $r=.2392$ ,  $p=.045$ ). Widowed subjects were not currently prescribed insulin. This relationship was neither expected or unexpected, and may be peculiar to this sample and related to sample size. Only 27% of the insulin dependent diabetics were not married. Marital status was also significantly related to sex ( $r=.1987$ ,  $p=.097$ ). Females were more often widowed. A significant relationship was found to exist between marital status and age ( $r=.3367$ ,  $p=.005$ ). The older subjects were widowed. This was expected for the widowed category, since as an individual's age increases the likelihood of being widowed increases.

A statistically significant relationship was found to exist between the employment status and prescription of insulin within the first year of diagnosis of diabetes ( $r=.2061$ ,  $p=.085$ ). More non-working subjects did not take insulin within the first year of diagnosis of diabetes. Employment status was also significantly related to age ( $r=.4286$ ,  $p=.000$ ). The older subjects were not currently working. These findings were expected since the majority of the subjects (79%) were not presently working and because of the age of the sample, many were likely to be retired. Not being prescribed insulin within the first year of the diagnosis of diabetes and; therefore, being classified as a non-insulin dependent diabetic occurs more often over the age of 65 (Laasko, & Pyorala, 1985). The employment status does have implications for the diabetic client. "Employed people with diabetes average 10.8 work-loss days per person per year compared with 5.4 for age-matched people without diabetes ("Closing the Gap", 1985, p.400). Working diabetics over the age of 45 "wonder if they will be able to keep their jobs or find new ones and if they will be able to hold onto their health insurance" (Holmes, 1986, p.195).

A significant relationship was found to exist between income and the time since diagnosis of diabetes ( $r=.2362$ ,  $p=.077$ ). As the subjects' income increased the time since diagnosis increased. This relationship was neither an expected or unexpected relationship, and may be related to this particular sample and the sample size. Fifty seven of the subjects were diagnosed with diabetes more than five years ago. Only three of the subjects (4%) were diagnosed within the past year or two. Eighty percent of the subjects have lived with diabetes for more than five years. The increase length of time since diagnosis may influence the diabetics' perceptions of susceptibility to diabetic complications, severity of diabetes, and benefits of and barriers to preventive measures.

Income was also negatively related to marital status ( $r=-.3853$ ,  $p=.003$ ). Married subjects reported higher incomes than did single, divorced, or widowed subjects. Income was also negatively related to employment status ( $r=-.2285$ ,  $p=.087$ ). Those subjects who were currently employed reported higher incomes. These were expected relationships because income in-

creases with combined spousal incomes and along with currently working. Income level was an important consideration in relation to the additional medical expenses incurred by diabetic individuals. These findings may have implications for diabetics who are not married and not working, and must bear the burden of additional cost for medical treatment.

The subjects were fairly evenly distributed among the income categories. However, 20% of the insulin dependent diabetics and 25% of the non-insulin dependent diabetics reported an income of \$10,000 or less. Twenty three percent of the total study sample; therefore, reported an income of \$10,000 or less. Income was found to be negatively related to the diabetics' perceived severity of diabetes ( $r=-.3294$ ,  $p=.017$ ). Therefore, as income decreased perceived severity of diabetes increased. Taylor (1987) stated health insurance for diabetics was comparable in terms of cost and coverage to the rest of the United States population. However, diabetics tend to be sicker and use more medical care than non-diabetics, which results in more out-of-pocket expenditures by diabetics (Taylor, 1987). Furthermore, the diabetics who do not have or cannot get health insurance "often experience extremely high financial burdens" (Taylor, 1987, p.92). Individuals with limited incomes also have difficulties meeting the costs of daily living as diabetics, for example the inability to afford a nutritious diet, or adequate dental care (Marble, 1985).

A statistically significant relationship was found to exist between attending a diabetic class and the current prescription of insulin ( $r=.3374$ ,  $p=.004$ ). Subjects not currently prescribed insulin did not attend a diabetic class. This indicates the subjects currently taking insulin were more likely to have attended a diabetic class in the past. Attending a diabetic class was also significantly related to being prescribed insulin within the first year of diagnosis ( $r=.1941$ ,  $p=.105$ ). Subjects not prescribed insulin within the first year of diagnosis did not attend a diabetic class. Therefore, the subjects prescribed insulin within the first year of diagnosis, the insulin dependent diabetics, were more likely to have attended a diabetic class. From personal clinical nursing experience, the researcher notes these two relationships were expected. More insulin dependent diabetics appear to attend community diabetic classes than non-insulin dependent diabetics. This finding

lends support to that of Paulozzi, Norman, McMahon, and Connell's (1984) study which found 88% (N=282) of the diabetics enrolled in a diabetic education program had no prior formal diabetes education since diagnosis with diabetes. Seventy one percent (N=282) of the subjects in Paulozzi's, et al., (1984) study were classified as non-insulin dependent diabetics.

Attending a diabetic class was also significantly related to marital status ( $r=.2978$ ,  $p=.012$ ). Married subjects were more likely to have attended a diabetic class. The reason for this relationship may be determined through additional qualitative data collection. Findings however did not indicate a significant relationship between attending a diabetic class and the subscales. Thus, attending a diabetic class did not significantly relate to the diabetics' perceptions with regards to susceptibility to diabetic complications, severity of diabetes, and benefits of and barriers to preventive measures. The findings did support Jenny's (1986) recommendation that spouses/significant others be enlisted to attend educational sessions in order to gain understanding and give support to the diabetic partner. However, the implication for nurse education is to ensure diabetic classes for the unmarried, widowed, and divorced. These groups may be unrepresented in diabetic teaching classes. Perhaps nurses should be aware that these groups may need encouragement to attend classes and ensure availability and accessibility of instruction to these groups.

The majority of the diabetics reported receiving diabetic information from physicians (93%) and from dieticians (66%). Just over half of the sample received diabetic information from nurses (54%), diabetic newsletters (55%), and newspapers and magazines (51%). The large percentage of the sample that received diabetic information from physicians may be attributed to the study's setting. The subjects completed the WDPS in a private physician's office while waiting for their appointment with the physician. More subjects received diabetic information from dieticians than from nurses. The number of subjects who received diabetic information from nurses indicated, for this sample, that nearly half (46%) were not being educated by nurses. Diabetic patient education is well within the domain of nursing practice and can be considered an independent nursing function. This study may have indicated this specific physician's referral pattern. The

physician may have referred diabetic patients to dieticians for counseling on nutrition and not referred clients to nurses for diabetic teaching.

Questions number 15 and 16 pertained to the diabetics' perception of how much doctors (#15) and nurses (#16) can help improve the diabetic's present health. The questions anchors were "believe they can not (1)" and "believe they can (5)". Both the insulin dependent diabetics (mean 4.45) and non-insulin dependent diabetics (mean 4.22) strongly believed physicians could improve their present health. However, the insulin dependent diabetics (mean 3.93) and the non-insulin dependent diabetics (mean 3.72) did not feel as strongly that nurses could improve their present health. Nurses have a responsibility to educate the diabetic population about the management of their disease process. Whether in the community or in the institutional setting, nurses often spend more time with patients than do physicians. Nurses have the opportunity to promote health and prevent complications through diabetic education. In addition, patient teaching is an opportunity for nurses to demonstrate to the public their role in health education. The perceptions of nurses as knowledgeable advocates of health promotion can be enhanced through activities such as patient education. Diabetic patient education is greatly needed as the length of hospital stays continues to decrease with less time to educate the diabetic individual (Curtin, 1986).

### Subscales

The findings will now be discussed in relation to the three research questions.

#### Research Question 1

The first research question of this study was: What are the perceptions of insulin dependent diabetics with regard to susceptibility to diabetic complications, severity of diabetes, and benefits of and barriers to preventive measures? The range of possible total scores on the perceived susceptibility to diabetic complications subscale was from zero to 20, with the lower scores

representing lower perceived susceptibility and the higher scores representing higher perceived susceptibility. The insulin dependent diabetic mean score was 16.80 (s.d. 2.78) on the perceived susceptibility to diabetic complications; therefore, the insulin dependent diabetics responded to 84% of the total possible points on the perceived susceptibility subscale. The perceived severity subscale possible total scores ranged from zero to 30, with the lower scores representing lower perceptions of severity of diabetes and higher scores representing higher perceptions of severity of diabetes. The insulin dependent diabetic mean score on the perceived severity of diabetic subscale was 22.90 (s.d. 4.49). The insulin dependent diabetic responded to 76% of the possible total points on the perceived severity subscale.

On the perceived benefits of preventive measures subscale the range of possible total scores was from zero to 25. Lower scores represented lower perceived barriers to preventive measures while higher scores represented higher perceived barriers to preventive measures. The insulin dependent diabetic mean score on the perceived benefits of preventive measures was 20.17 (s.d. 3.88). Eighty one percent of the possible points were responded to by the insulin dependent diabetics on the perceived benefits of preventive measures subscale. The range of possible total scores on the perceived barriers subscale was from zero to 45, with the lower scores representing lower perceived barriers to preventive measures and the higher scores representing higher perceived barriers to preventive measures. The mean score for the insulin dependent diabetic on the perceived barriers to preventive measures was 32.43 (s.d. 5.57); therefore, 72% of the possible points on the perceived barriers to preventive measures subscale were responded to by the insulin dependent diabetic subjects. The total scale mean for the insulin dependent diabetic was 92.24 (s.d. 11.04) with a total scale possible score ranging from zero to 120. Seventy seven percent of the total points were responded to by the insulin dependent diabetics on the total scale. These findings indicated the insulin dependent diabetic perceived a moderate degree of susceptibility to diabetic complications, severity of diabetes, and benefits of and barriers to preventive measures.

The Pearson product moment correlation coefficient was used to summarize the magnitude and direction of the relationships between the demographic variables and the four subscales: perceived susceptibility to diabetic complications, severity of diabetes, and benefits of and barriers to preventive measures. Significant relationships were found to exist between the current prescription of insulin and perceived susceptibility to diabetic complications ( $r=-.3698$ ,  $p=.002$ ), and the current prescription of insulin and perceived severity of diabetes ( $r=-.2430$ ,  $p=.049$ ). Subjects who were currently prescribed insulin perceived susceptibility to diabetic complications and severity of diabetes as greater than subjects not currently prescribed insulin. These were expected findings. From personal clinical nursing experience with diabetics, the researcher concurs that diabetics currently prescribed insulin appear to perceive their susceptibility to diabetic complications and severity of diabetes as greater than the diabetics not currently prescribed insulin. This study, however, did not address the actual presence of diabetic complications in the subjects which may have influenced their perceived susceptibility to diabetic complications. According to Vranic (1985) all diabetic complications may develop in insulin dependent diabetics and non-insulin dependent diabetics, but data on the prevalence and incidence of the complications for each type of diabetes have not been compiled.

Perceived severity of diabetes was also related to the prescription of insulin within the first year of diagnosis of diabetes ( $r=-.2370$ ,  $p=.055$ ). Subjects who were prescribed insulin within the first year of diagnosis, insulin dependent diabetics, perceived diabetes as more severe than did subjects not prescribed insulin within the first year of diagnosis, non-insulin dependent diabetics. This was an expected finding. Again, from personal nursing clinical experience with diabetics the researcher notes, the insulin dependent diabetics appear to perceive diabetes as more severe than the non-insulin dependent diabetics.

Since perceived severity to diabetes was related to the current prescription of insulin and the prescription of insulin within the first year of diagnosis, diabetic education must assess the diabetic individual's perceived severity. The insulin dependent diabetic perceived diabetes as

more severe than the non-insulin dependent diabetic. The severity of diabetes must be emphasized through diabetic patient education to each diabetic whether an insulin dependent diabetic or a non-insulin dependent diabetic.

A significant negative relationship was found to exist between perceived severity of diabetes and income ( $r = -.3294$ ,  $p = .017$ ). As the subjects' income decreased the perceptions with regards to severity of diabetes increased. This finding may be related to the medical costs which the diabetic must meet. The lower income diabetic may be affected to a greater extent as Taylor reported "total medical expenses in 1977 for individuals with diabetes were about three times higher than for others" (1987, p.90). Therefore, the income of diabetics must be brought into consideration when educating diabetics.

A statistically significant relationship was found to exist between the perceived benefits of preventive measures and the sex of the subject ( $r = .2150$ ,  $p = .074$ ). More female subjects perceived benefits of preventive measures than did the male subjects. This relationship was neither a expected or unexpected, and may be related to this sample and the sample size. If females perceived preventive measures as more beneficial than males, diabetic patient education needs to emphasize the benefits of preventive measures to male diabetics. The benefits of preventive measures also need to be reinforced to the female diabetics through diabetic patient education. This relationship warrants further investigation.

Perceived benefits of preventive measures was also negatively related to the age of the subject ( $r = -.3616$ ,  $p = .003$ ). As the subjects' age increased the perceived benefits of preventive measures decreased. This relationship was expected, but warrants further investigation. If the older diabetics perceived preventive measures as less beneficial than the younger diabetics, then diabetic patient education must emphasize the benefits of preventive measures to the older diabetics. The benefits of preventive measures also need to be reinforced in the younger diabetic.

A significant negative relationship was found to exist between perceived barriers to preventive measures and the age of the subject ( $r = -.3332$ ,  $p = .006$ ). Older subjects perceived fewer

barriers to preventive measures. The older subjects overall perceived the benefits of preventive measures as less beneficial, and the barriers to preventive measures as less restricting. On the other hand, the younger subjects perceived more benefits of preventive measures, and more barriers to preventive measures. Diabetic patient education needs to assist the younger diabetic in adjusting to the diabetic regimen in order to minimize the perceived barriers to preventive measures. The two negative relationships between age and perceived benefits of and barriers to preventive measures were expected relationships, supported by Holmes (1986) who found adult diabetics were able to divert themselves from their disease and its implications for a matter of hours or even days. Whereas, youths with insulin dependent diabetes were reminded of their diabetes several times a day (Holmes, 1986) and were less able to separate themselves from their disease and its implications.

#### Research Question 2

The second research question of this study was: What are the perceptions of non-insulin dependent diabetics with regard to severity of diabetes, susceptibility to diabetic complications, and benefits of and barriers to preventive measures? The range of possible total scores on the perceived susceptibility to diabetic complications subscale was zero to 20, with the lower scores representing lower perceived susceptibility to diabetic complications and higher scores representing higher perceived susceptibility to diabetic complications. The non-insulin dependent diabetic mean score was 15.85 (s.d.4.26) on the perceived susceptibility to diabetic complications subscale; therefore, the non-insulin dependent diabetic responded to 79% of the total possible points on the subscale. The perceived severity of diabetes subscale possible total scores ranged from zero to 30, with the lower scores representing lower perceptions of severity of diabetes, and the higher scores representing higher perceptions of severity of diabetes. The non-insulin dependent diabetic mean score on the perceived severity of diabetes subscale was 20.58 (s.d. 5.10). The non-insulin dependent diabetic responded to 69% of the possible total

points on the perceived severity of diabetes subscale.

On the perceived benefits of preventive measures subscale the range of possible total scores was from zero to 25. Lower scores represented lower perceived benefits of preventive measures while higher scores represented higher perceived benefits of preventive measures. The non-insulin dependent diabetic mean score on the perceived benefits of preventive measures was 19.00 (s.d. 5.31). Seventy six percent of the possible points were responded to by the non-insulin dependent diabetic on the perceived benefits of preventive measures subscale. The range of possible total scores on the perceived barriers subscale was from zero to 45, with lower scores representing lower perceived barriers to preventive measures and higher scores representing higher perceived barriers to preventive measures. The mean score for the non-insulin dependent diabetic on the perceived barriers to preventive measures subscale was 31.38 (s.d. 6.14). Seventy percent of the possible points on the perceived barriers to preventive measures were responded to by the non-insulin dependent diabetic subjects. The total scale mean for the non-insulin dependent diabetic was 87.77 (s.d. 14.89) with a total scale possible score ranging from zero to 120. Seventy seven percent of the total points were responded to by the insulin dependent diabetic on the total scale. These findings indicated the non-insulin dependent diabetic perceived a moderate degree of susceptibility to diabetic complications, severity of diabetes, benefits of and barriers to preventive measures.

The Pearson product moment correlation coefficient was used to summarize the magnitude and direction of the relationships between the demographic variables and the four subscales: perceived susceptibility to diabetic complications, severity of diabetes, and benefits of and barriers to preventive measures. Significant relationships were found to exist between the current prescription of insulin and perceived susceptibility to diabetic complications ( $r=-.3698$ ,  $p=.002$ ) and the current prescription of insulin and perceived severity of diabetes ( $r=-.2430$ ,  $p=.049$ ). Subjects who were not currently prescribed insulin perceived a lower susceptibility to diabetic complications and less severity to diabetes than subjects currently prescribed insulin.

These were expected findings. From personal clinical nursing experience with diabetics, the researcher concurs that diabetics not currently prescribed insulin appear to perceive a lower susceptibility to diabetic complications and less severity to diabetes than the diabetics currently prescribed insulin. This study, however, did not address the actual presence of diabetic complications in the subjects which may have influenced their perceived susceptibility to diabetic complications. According to Vranic (1985), all diabetic complications may develop in insulin dependent diabetics and non-insulin dependent diabetics, but data on the prevalence and incidence of the complications for each type of diabetes have not been compiled.

Perceived severity of diabetes was also related was to the prescription of insulin within the first year of diagnosis of diabetes ( $r=-.2370$ ,  $p=.055$ ). Subjects who were not prescribed insulin within the first year of diagnosis, non-insulin dependent diabetics, perceived diabetes as less severe than did subjects prescribed insulin within the first year of diagnosis, insulin dependent diabetics. This was an expected finding. Again, from personal clinical nursing experience with diabetics, the researcher notes the non-insulin dependent diabetics appear to perceive diabetes as less severe than the insulin dependent diabetics.

Since perceived severity to diabetes was related to the current prescription of insulin and the prescription of insulin within the first year of diagnosis, diabetic education must assess the diabetic individual's perceived severity. The non-insulin dependent diabetic perceived diabetes as less severe than the insulin dependent diabetic. This study did not differentiate between the non-insulin dependent diabetic who was not currently prescribed insulin and the non-insulin dependent diabetic who was currently prescribed insulin. From personal nursing clinical experience, the researcher concurs the non-insulin dependent diabetic currently prescribed insulin appears to perceive diabetes as more severe than the non-insulin dependent diabetic not currently prescribed insulin. The severity of diabetes must be emphasized through diabetic patient education to each diabetic whether the diabetic is insulin dependent, non-insulin dependent currently prescribed insulin, or non-insulin dependent currently not prescribed insulin.

A significant negative relationship was found to exist also between perceived severity of diabetes and income ( $r=-.3294$ ,  $p=.017$ ). As the subjects' income decreased the perceptions with regards to severity of diabetes increased. This finding may be related to the medical costs which the diabetic must meet. The lower income diabetic may be affected to a greater extent as Taylor reported "total medical expenses in 1977 for individuals with diabetes were about three times higher than for others" (1987, p.90). Therefore, the income of diabetics must be considered in all diabetic patient education.

A statistically significant relationship was found to exist between the perceived benefits of preventive measures and the sex of the subject ( $r=.2150$ ,  $p=.074$ ). More female subjects perceived benefits of preventive measures than did the male subjects. This relationship was neither a expected or unexpected, and may be related to this sample and the sample size. This relationship warrants further investigation. If females perceived preventive measures as more beneficial than males, then diabetic patient education must emphasize the benefits of preventive measures to the male diabetics. The benefits of preventive measures also need to be reinforced to the female subjects.

A significant negative relationship was found to exist between the perceived benefits of preventive measures and the age of the subject ( $r=-.3616$ ,  $p=.003$ ). As the subjects' age increased the perceived benefits of preventive measures decreased. This relationship was neither expected, but warrants further investigation. If the older diabetics perceived preventive measures as less beneficial than the younger diabetics, then diabetic patient education must emphasize the benefits of preventive measures to the older diabetics. The benefits of preventive measures also need to be reinforced in the younger diabetic.

Age was also negatively related to perceived barriers to preventive measures ( $r=-.3332$ ,  $p=.006$ ). Older subjects perceived fewer barriers to preventive measures. The older subjects overall perceived the benefits of preventive measures as less beneficial, and the barriers to preventive measures as less restricting. On the other hand, the younger subjects perceived

more benefits of preventive measures, and more barriers to preventive measures. The two negative relationships between age and perceived benefits of and barriers to preventive measures were expected relationships, supported by Holmes (1986) who found adult diabetics were able to divert themselves from their disease and its implications for a matter of hours or even days. Whereas, youths with insulin dependent diabetes were reminded of their diabetes several times a day (Holmes, 1986) and were less able to separate themselves from their disease and its implications.

### Research Question 3

The third research question of this study was: What are the differences, if any, between insulin dependent diabetics' and non-insulin dependent diabetics' perceptions of susceptibility to diabetic complications, severity of diabetes, and benefits of and barriers to preventive measures? To determine if there was a statistical difference in the magnitude of the mean scores of the four subscales and the total scale, between perceptions of the insulin dependent diabetic and the non-insulin dependent diabetic, two-tailed *t* tests were performed.

Findings indicated that insulin dependent diabetics perceived diabetes to be significantly more severe than did non-insulin dependent diabetics ( $t=1.92, p=.006$ ). The difference between the insulin dependent diabetics' and non-insulin dependent diabetics' perceptions of severity of diabetes was expected. This finding supported personal clinical nursing experience from which the researcher notes, the insulin dependent diabetics generally appeared to perceive their diabetes as more severe than the non-insulin dependent diabetics. The difference in perceptions has implications for diabetic education of both insulin dependent diabetics and non-insulin dependent diabetics. The difference in perceived severity of diabetes between the insulin dependent diabetics and non-insulin dependent diabetics supported Jenny's statement that non-insulin dependent diabetics may "perceive their diabetes as less threatening" (1986, p.49)

than insulin dependent diabetics. Tattersall also suggested non-insulin dependent diabetics may "perceive diabetes as a matter of little concern" (1984, p.172). Therefore, nurses need to explore with non-insulin dependent diabetics the potential severity of diabetes and the need to adhere to the prescribed regimen.

The magnitude of the difference between the insulin dependent diabetics' perception of severity of diabetes and the non-insulin dependent diabetics' perception of severity of diabetes may have been greater, if the study had differentiated between the diabetics who had diabetic complications and diabetics who did not have diabetic complications. Personal clinical nursing observations suggested that a non-insulin dependent diabetic may have perceived diabetes as not serious until development of diabetic complications occurred. The perception of severity of diabetes may be altered with the onset of complications. The need to emphasize to non-insulin dependent diabetics the potential for complications can not be overlooked.

The results of the *t* tests did not indicate a statistical difference between the insulin dependent diabetics' and non-insulin dependent diabetics' perceptions of susceptibility to diabetic complications, benefits of preventive measures, or barriers to preventive measures. However, newly diagnosed insulin dependent diabetics and non-insulin dependent diabetics may have perceived the susceptibility to diabetic complications, benefits of and barriers to preventive measures as different. The sample for this study consisted of mostly diabetics diagnosed more than five years ago, which may have influenced their perceptions. This length of time between diagnosis and this survey of perceptions may have influenced the results.

### Conclusions

The Wortell Diabetic Perception Scale was a newly developed instrument with a standardized coefficient alpha of 0.82. In the early stages of research, Nunnally (1978) suggested a reliability of 0.70 or higher on predictor tests or hypothesized measures of a construct is adequate. Therefore, the standardized coefficient alpha of 0.82 was a significant reliability value for this new

scale. The subscale standardized coefficient alphas ranged from 0.62 to 0.72. Along with the length and ease of administering the WDPS the scale will be useful in the clinical setting after further study. Further study of the WDPS may strengthen these findings within the subscales as well as for the total scale.

Findings indicated that insulin dependent diabetics perceived diabetes to be significantly more severe than non-insulin dependent diabetics. The difference in perceived severity of diabetes has implications for diabetic education of both insulin dependent diabetics and non-insulin dependent diabetics. Continued development of the WDPS, may provide data to support additional differences between the insulin dependent diabetics and non-insulin dependent diabetics.

The older subjects were not currently prescribed insulin, were not married, and did not attend a diabetic class in the past. More widowed subjects were females. Nursing must ensure diabetic patient education for the elderly, single, divorced, widowed, and non-insulin dependent diabetics. These groups may need encouragement to attend classes and assistance in accessibility to diabetic education.

Subjects not currently prescribed insulin perceived less susceptibility to diabetic complications than subjects currently prescribed insulin. The younger diabetic subjects perceived more benefits of preventive measures than the older diabetic subjects. The younger subjects also perceived more barriers to preventive measures than the older subjects. Females perceived preventive measure as more beneficial than did the males. These relationships have implications for diabetic patient education. Diabetics not currently prescribed insulin need to be taught about the severity of diabetes and the potential diabetic complications. The benefits of preventive measures must be emphasized to the older diabetics, and the male diabetics. The younger diabetics must be assisted in adjusting to the diabetic regimen in order to minimize the perceived barriers to preventive measures.

### Limitations

The limitations of the study are as follows:

1. The sample was a non-randomized, convenience sample, and limited to one setting.
2. The WDPS was a new instrument with no prior established reliability or validity.
3. The findings were restricted by the trustworthiness of data provided by the subjects.

### Recommendations

Recommendations for future research based on this investigation are as follow:

1. Replicate the study with a larger sample size.
2. Develop the WDPS to include items which address anger, resentment, and discouragement to the subscale of perceived barriers to preventive measures.
3. Develop the WDPS to include the Health Belief Model concept of cues to action.
4. Develop the WDPS to increase the reliability of the subscales.
5. Rephrase several questions to include present and past tense. For example, (question #9) How much do you believe diabetes will/has changed your lifestyle?.
6. Add a question addressing the presence of diabetic complications.
7. Obtain a more heterogenous sample, such as adolescents, Spanish speaking subjects, newly diagnosed diabetics, and gestational diabetics.
8. Extend to diverse settings for data collection.
9. Duplicate the WDPS in larger print for visually impaired diabetics.

### Nursing Implications

This study showed 46% of the diabetics had not received diabetic information from nurses in the past. Patient education is a major role function for all nurses (ANA, 1980). Presently, diabetic education primarily occurs on an inpatient basis. Alogna (1985) reported 80% of the hospitals in 20 states offered inpatient education services, but less than 25% offered these services on an outpatient basis. Current trends in the health care system may see an increase in outpatient diabetic education (Curtin, 1986). According to Bartlett, "patient education is an integral and essential component of high quality health services" (1985, p.224). Yet, "patient education in chronic disease management is a complex process" (Magill, Williams, & Caspi, 1986, p.45), which nurses must evaluate and intervene upon. "Quality patient education is an integral part of diabetes care and improved access to quality education will ultimately lead to improved health outcomes for persons with diabetes" (Alogna, 1985, p.36).

The traditional diabetes education programs which emphasized only knowledge and self-care are inadequate (Speers, & Turk, 1981). Such programs fail to consider individual's perceptions of the disease, lifestyle, beliefs and motivation, support systems, and relations with the health care provider. "When learning is viewed as more than the assimilation of facts and seen as a dynamic search for relevant personal meaning and self-enhancement, the teaching role becomes one of a facilitator, helper, and colleague" (VanHoozer, et al., 1987, p.8).

The traditional diabetes education program does not differentiate between the insulin dependent diabetic and non-insulin dependent diabetics' perceptions of diabetes. This study has provided data to support a difference in the insulin dependent and non-insulin dependent diabetics' perceptions of diabetes with regards to severity of diabetes. Nursing interventions, in relation to patient education, need to differentiate between non-insulin dependent diabetic and insulin dependent diabetics.

The length and the Likert-type format of the WDPS contributed to the ease of administering the scale to diabetic clients. The majority of the subjects completed the WDPS within ten

minutes, the longest time required to complete the WDPS by one subject was approximately 20 minutes.

After further development, the WDPS may serve as part of the nursing assessment of diabetics' perception with regards to susceptibility to diabetic complications, severity of diabetes, benefits of and barriers to preventive measures. With continued development, the WDPS may be scaled to indicate areas to emphasize during diabetic patient education. For example, if a diabetic scored above a specific score on the perceived severity scale the nurse would assess the diabetic's perception of the severity of diabetes and adjust teaching material and teaching methods accordingly. However, if the diabetic scored below a specific score on the perceived severity subscale the nurse could emphasize the severity of diabetes in teaching the diabetic. "People with diabetes should be encouraged to view themselves as a population with a disproportionate number of risk factors for adverse health outcomes" ("Closing the Gap", 1985, p.403). If the diabetic scored high on the perceived barriers subscale, the nurse could assist the diabetic with restructuring daily routines to accommodate the regimen, and identify individual strategies for dealing with perceived barriers (Jenny, 1986).

Utilizing the WDPS as an assessment tool along with further qualitative assessment would further individualize diabetic teaching. McLaughlin and Kowarski (1984) stated individualized instruction was necessary for the heterogeneous condition of diabetes. To educate diabetics, nurses must systematically assess the diabetic in terms of the diabetic's description of his/her attributes, traits, aspirations, expectations, experiences (Rottkamp, & Donohue-Porter, 1983), and perceptions. "Nurses need to investigate and identify the factors that influence the patient's decision" (Hijek, 1984, p.452). "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" (Mazzuca, et al., 1986, p.10).

### Summary

This study described the insulin dependent diabetics' and non-insulin dependent diabetics' perceptions of severity of diabetes, susceptibility to diabetic complications, and benefits of and barriers to preventive measures. A significant difference was found between insulin dependent diabetics' and non-insulin dependent diabetics' perceptions of severity of diabetes. The non-insulin dependent diabetics were not currently working and had not attended a diabetic class, while the insulin dependent diabetics were currently working and had attended a diabetic class. The non-insulin dependent diabetics were older, and perceived less susceptibility to diabetic complications, and less severity of diabetes than the insulin dependent diabetics. The newly developed WDPS had a high reliability for a new scale. After further development and testing of the WDPS, the scale may be used as an assessment tool of diabetics by nurses prior to educating the diabetic. Nurses must remember "education is not an addition to treatment, it is treatment" (Guthrie, 1986, p.133).

**APPENDIX A**  
**HUMAN SUBJECTS APPROVAL LETTER**



THE UNIVERSITY OF ARIZONA  
TUCSON, ARIZONA 85721

COLLEGE OF NURSING

MEMORANDUM

TO: Ms. Linda Harbaugh Wortell

FROM: Linda R. Phillips, PhD, RN, FAAN *LRP*  
Acting Director of Research

DATE: June 23, 1987

RE: Human Subjects Review:

Your project has been reviewed and approved as exempt from University review by the College of Nursing Ethical Review Subcommittee of the Research Committee and the Director of Research. A consent form with subject signature is not required for projects exempt from full University review. Please use only a disclaimer format for subjects to read before giving their oral consent to the research. The Human Subjects Project Approval Form is filed in the office of the Director of Research if you need access to it.

We wish you a valuable and stimulating experience with your research.

LRP/ms

**APPENDIX B**  
**PHYSICIAN'S APPROVAL**

I, Jonathan Insel, M.D., hereby give permission to Linda Wortell to collect data for her thesis "Health Beliefs of Insulin Dependent Diabetics and Non-insulin Dependent Diabetics" in my office. I have received a copy of the research questions, disclaimer, and the questionnaire to be used in the research study.

Signature Jonathan Insel

Date 6-30-87

Please return to:  
Linda Wortell  
5201 E. 2<sup>nd</sup> Street #E-18  
Tucson, Arizona 85711

**APPENDIX C  
DISCLAIMER**

**Disclaimer**

**Health Beliefs of  
Insulin Dependent Diabetics and  
Non-insulin Dependent Diabetics**

The purpose of this study is to determine the differences, if any, between the perceptions of insulin dependent and non-insulin dependent diabetics about their diabetes. In addition, you are asked to provide some background information. This information will assist nurses in teaching diabetic patients about diabetes.

You are being asked to voluntarily give your opinion on the 26 statements in this questionnaire. There are no known risks involved in completing the questionnaire. By responding to the questionnaire you will be giving your consent to participate in the study. Your name is not on the questionnaire. Your decision regarding study participation or your responses to the items on the questionnaire will not affect your care in any way. Any questions you have about the study or the questionnaire will be answered. You may withdraw from the study at any time. The data gathered will be used to complete a masters thesis at the College of Nursing, University of Arizona. Only the investigator and her thesis committee chairman will have access to the information which you provide.

Thank you for completing the questionnaire.

Linda Wortell, R.N.

**APPENDIX D**

**WORTELL DIABETIC PERCEPTION SCALE  
SAMPLE QUESTIONS**

**INSTRUCTIONS FOR PART I:**

Part I is a 26 item questionnaire which asks for your perception of diabetes.

EACH QUESTION ASKS HOW YOU VIEW YOUR DIABETES ON A SCALE FROM 1 TO 5, WITH 1 BEING THE MOST NEGATIVE RESPONSE AND 5 BEING THE MOST POSITIVE RESPONSE. CHOOSE THE NUMBER WHICH BEST FITS HOW YOU FEEL.

CIRCLE THE NUMBER WHICH BEST CORRESPONDS TO YOUR ANSWER. THE QUESTIONS WILL TAKE YOU APPROXIMATELY 10-15 MINUTES TO ANSWER.

Sample question:

Do you exercise for 20 minutes three times a week?

NEVER

ALWAYS

1 2 3 4 5

**PART I: Wortell Diabetic Perception Scale**

2. Do you believe that you have diabetes now?	DO NOT BELIEVE SO	1 2 3 4 5	BELIEVE SO
3. Do you believe that you could likely have a diabetic complication within the next 5 years?	UNLIKELY	1 2 3 4 5	LIKELY
6. How serious do you believe your diabetes is?	NOT SERIOUS	1 2 3 4 5	VERY SERIOUS
9. How much do you believe diabetes will change your present lifestyle?	NO CHANGE	1 2 3 4 5	MUCH CHANGE
15. How much do you believe that doctors can help you improve your present health?	BELIEVE THEY CAN	1 2 3 4 5	BELIEVE THEY CAN NOT
16. How much do you believe that nurses can help you improve your present health?	BELIEVE THEY CAN	1 2 3 4 5	BELIEVE THEY CAN NOT
21. If you were asked to spend more of your money on food for your diabetic meal plan, how willing would you be?	NOT WILLING	1 2 3 4 5	VERY WILLING
25. How helpful do you believe your family would be if you tried changing some of your personal habits?	NOT HELPFUL	1 2 3 4 5	VERY HELPFUL



8. My current employment status is: \_\_\_\_\_ Presently working  
\_\_\_\_\_ Presently not working

9. My present income status is: \_\_\_\_\_ \$10,000 or less a year  
\_\_\_\_\_ \$11,000 - \$20,000 a year  
\_\_\_\_\_ \$21,000 - \$30,000 a year  
\_\_\_\_\_ \$31,000 or more a year

10. I have attended diabetic classes in the past. \_\_\_\_\_ Yes  
\_\_\_\_\_ No

11. I have received diabetic information from:

\_\_\_\_\_ Friends  
\_\_\_\_\_ Family  
\_\_\_\_\_ Newspapers/ Magazines  
\_\_\_\_\_ Diabetic Newsletters  
\_\_\_\_\_ Nurses  
\_\_\_\_\_ Dieticians  
\_\_\_\_\_ Doctors  
\_\_\_\_\_ Others (Please list)  
\_\_\_\_\_

**APPENDIX E**

**TOOL MODIFICATION PERMISSION**

I, Thomas W. Hjeck, hereby give permission to Linda Wortell to modify the "Questionnaire for Predicting Patient Entrance to a Cardiac Rehabilitation Program". The tool was published in the following article: "The health belief model and cardiac rehabilitation" Nursing Clinics of North America, 19(3), 449-457. I understand the tool will be modified to the diabetic population in regards to diabetic education/rehabilitation.

Signature Thomas W. Hjeck  
Date 3/11/87

Please return to:  
Linda Wortell  
5201 E. 2<sup>nd</sup> Street E-18  
Tucson, Arizona 8571

25 February 87

5201 E. 2nd Street E-18  
Tucson, Arizona 85711  
(602)-326-1530

Sarah Zarbock, Editor  
The Nursing Clinics of North America  
W.B. Saunders Company  
W. Washington Square  
Philadelphia, Pennsylvania 19105

Dear Ms. Zarbock,

I am requesting permission to modify a questionnaire in the following publication:

OK  
Hijek, T. W. (1984). The health belief model and cardiac rehabilitation. Nursing Clinics of North America, 19(3), 449-457.

The questionnaire is titled "Questionnaire for Predicting Patient Entrance to a Cardiac Rehabilitation Program". The modification would be part of my thesis work at the University of Arizona. The modified questionnaire would focus on the diabetic patient rather than the cardiac patient.

I have contacted Mr. Hijek and received his permission to modify the tool. Please forward permission to modify this questionnaire at your earliest convenience to the above address.

Permission granted by the copyright owner provided complete credit is given to original source.

Julie Lawley 3-6-87  
W. B. Saunders Company Date

Sincerely,

*Linda Wortell*  
Linda Wortell, R.N., B.S.N.

**APPENDIX F**

**CONTENT VALIDITY**

You are being asked as an "expert" on the subject of diabetes to judge the content validity and clarity of the Wortell Diabetic Perception Scale (WDPS). Content validity indicates that an instrument represents the factors under study.

The WDPS was developed for my thesis entitled "Health Beliefs of Insulin Dependent and Non-insulin Dependent Diabetics". The conceptual framework for the study is the Health Belief Model which seeks to explain why, or why not, individuals participate in preventative health measures. This study utilizes four specific components of the model in relation to diabetes: perceived severity, perceived susceptibility, and perceived benefits of and barriers to preventative measures. Specifically the purpose of this descriptive nursing research study is to describe the insulin dependent and non-insulin dependent diabetics' perceptions of severity of diabetes, susceptibility to diabetic complications, and benefits of and barriers to preventative measures. A secondary purpose of this study is to develop and test an instrument which identifies the diabetic individuals' perceptions as described in the above.

The sample for the study will include individuals with the medical diagnosis of diabetes for one year or more, age 18 or over, and who read and write English.

Each item on the attached questionnaire represents a possible perception of the diabetics. Items 1-5 represent perceived susceptibility; items 6-12 represent perceived severity; items 13-17 represent perceived benefits; and items 18-26 represent perceived barriers. Since there has been no previous research on the insulin dependent and non-insulin dependent diabetics' perceptions with regards to susceptibility, severity, and benefits of and barriers to preventative measures, the items were derived from the literature and the researcher's personal observations. As an expert on diabetes you are asked to judge if the items on the instrument are relevant representations of possible perceptions of the insulin dependent and non-insulin dependent diabetic.

A structured form to use in your assessment of content validity is attached, along with a copy of the instrument. Please complete and return the evaluation forms to me by June 12, 1987.

Thank you for your assistance,  
Linda Wortell, Graduate Student  
University of Arizona

### Content Validity and Clarity Evaluation Form

Directions: The items in Part I of the instrument are to be judged for content validity and clarity. On this form, the item number given corresponds to the item number in Part I of the attached tool. Use the scale following each item to rate the items relevance. Each scale ranges from 1 to 4, where 1=irrelevant and 4=extremely relevant. Circle the number that indicates your rating. Then circle yes or no in the right column to indicate whether or not the item is written clearly.

Item#		Is the item written clearly? (If no, please suggest improvements in the space following.)	
1.	1 2 3 4	yes	no
2.	1 2 3 4	yes	no
3.	1 2 3 4	yes	no
4.	1 2 3 4	yes	no
5.	1 2 3 4	yes	no
6.	1 2 3 4	yes	no
7.	1 2 3 4	yes	no
8.	1 2 3 4	yes	no
9.	1 2 3 4	yes	no
10.	1 2 3 4	yes	no
11.	1 2 3 4	yes	no
12.	1 2 3 4	yes	no
13.	1 2 3 4	yes	no
14.	1 2 3 4	yes	no
15.	1 2 3 4	yes	no
16.	1 2 3 4	yes	no
17.	1 2 3 4	yes	no
18.	1 2 3 4	yes	no
19.	1 2 3 4	yes	no

- |     |         |     |    |
|-----|---------|-----|----|
| 20. | 1 2 3 4 | yes | no |
| 21. | 1 2 3 4 | yes | no |
| 22. | 1 2 3 4 | yes | no |
| 23. | 1 2 3 4 | yes | no |
| 24. | 1 2 3 4 | yes | no |
| 25. | 1 2 3 4 | yes | no |
| 26. | 1 2 3 4 | yes | no |

Please rate the overall relevance of the entire instrument according to the same scale.

1 2 3 4

Please identify any items that may have been omitted from the instrument? (List and explain.)

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Please suggest any ideas for item improvement (list by item #). If you rated an item as irrelevant, please explain your rationale. If you rated an item as a 2 or 3, please indicate what is wrong with the item; and revise if possible.

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For the items in **Part II, Demographic Data**, please indicate if the item was written clearly by circling yes or no, and adding suggestions for improvement in the space following if appropriate.

Item #

1.	yes	no
2.	yes	no
3.	yes	no
4.	yes	no
5.	yes	no
6.	yes	no
7.	yes	no
8.	yes	no
9.	yes	no
10.	yes	no
11.	yes	no

THANK YOU!

**APPENDIX G**  
**CODING DICTIONARY**

Coding Dictionary

<u>Variable Name</u>	<u>Variable Label</u>	<u>Value</u>
ID	Identification	000-999
WDPS 1-26	WDPS 1-26	1-5
INSULIN	Prescribed insulin currently	Yes=1 No=2
ONE YEAR	Insulin within first year of diagnosis	Yes=1 No=2
TIMEDX	Time since diagnosis	1-2 years=1 3-5 years=2 > 5 years=3
FAMHX	Family history of diabetes	Yes=1 No=2
SEX	Sex of subject	Male=1 Female=2
AGE	Age of subject	18-999
MARITAL	Marital Status	Married=1 Single =2 Divorced=3 Widowed=4
JOB	Employment Status	Working=1 Not Working=2
INCOME	Income Status	< \$10,000=1 \$11-20,000=2 \$21-30,000=3 > \$30,000=4
CLASS	Attended a diabetic class	Yes=1 No=2

Coding Dictionary - (continued)

<u>Variable Name</u>	<u>Variable Label</u>	<u>Value</u>
INFO	Informational Sources	
	Friends}	
	Family}	
	Newspaper/Magazines}	
	Diabetic Newsletters}	Yes=1
	Nurses}	No=2
	Dieticians}	
	Doctors}	
	Other}	

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