

EFFECTS OF SELF-CONCEPT ON HEALTH CARE COMPLIANCE
IN NON-INSTITUTIONALIZED DIABETIC ELDERLY

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BY

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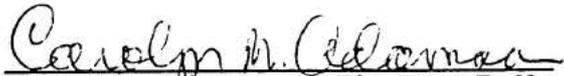
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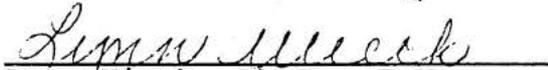
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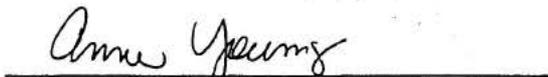
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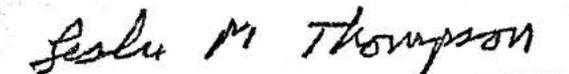

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ABSTRACT

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Noncompliance with health care regimens is a problem in the elderly. This study was designed to investigate the relationship between self-concept and compliance in a group of non-institutionalized elderly diabetic individuals. The Neeley Interactive Self-Concept Model of Nursing was used as a conceptual framework in a descriptive correlation design. Subjects, obtained from two privately owned clinics, completed a mailed questionnaire. Glycosylated hemoglobins were the measure of compliance. Other variables measured were client satisfaction, health beliefs, social support, and demographics. Multiple regression analysis was used to examine the relationships. No relationship was found between self-concept and compliance. A relationship was found between compliance and length of illness and complexity of health care regimen.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS	iv
ABSTRACT	v
Chapter	
1. INTRODUCTION	1
Problem of Study	3
Rationale for Study	3
Conceptual Framework	6
Assumptions	12
Research Questions	13
Definition of Terms	13
Limitations of Study	15
Summary	15
2. REVIEW OF LITERATURE	17
Compliance	17
Psychosocial Variables	26
Summary	43
3. PROCEDURE FOR COLLECTION AND TREATMENT OF DATA	45
Setting	45
Population and Sample	46
Protection of Human Subjects	47
Instruments	48
Data Collection	56
Treatment of Data	58
4. ANALYSIS OF DATA	59
Description of Sample	59
Psychosocial Constructs	64
Compliance	69
Findings	69
Summary of Findings	70
5. SUMMARY OF THE STUDY	75
Summary	75
Discussion of Findings	76
Conclusions and Implications	82
Recommendations for Further Study	83

REFERENCES	85
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APPENDIX

A. Agency Consent	95
B. Approval from Texas Woman's University and the University of Texas Health Science Center at Houston Human Subjects Review Committees	99
C. Letter of Consent	103
D. Permission to Reproduce Instruments	105
E. Instruments	110
F. Letters to Participants from Clinical Agencies	115
G. Frequency and Percentage of TSCS Subscales	118
H. Descriptive Statistics for the TSCS Subscales	123
I. Original HbA _{1c} and Transformed HbA _{1c} of Subjects	125
J. Frequency and Percentage of HbA _{1c} of Subjects	128

LIST OF TABLES

Table

1.	Frequency and Percentage of Age of Subjects	60
2.	Frequency and Percentage of Educational Level of Subjects	61
3.	Frequency and Percentage of Length of Illness of Subjects	62
4.	Frequency and Percentage of Annual Income Levels . . . of Subjects	64
5.	Frequency and Percentage of Modified Health Belief Model	65
6.	Frequency and Percentage of Personal Resource Scale	66
7.	Frequency and Percentage of Client Satisfaction . . . Questionnaire	67
8.	Comparision of Mean Scores of the Norm Group and the Study Sample	69
9.	Pearson Product Moment Correlation Coefficient . . . of Subscales of TSCS and HbA _{1c}	71
10.	Results of Hierarchial Multiple Regressions	73

CHAPTER 1

INTRODUCTION

By the year 2000 approximately 12.2% of the population in the United States will be over the age of 65 (Carnevali & Patrick, 1986). Of these older Americans, 86% will suffer from one or more chronic illnesses (Bullough & Bullough, 1990; Eliopoulos, 1982). Well defined and effective health care regimens exist to treat most of these disease processes; however, noncompliance with the health protocols is a wide-spread problem. The estimated rate of noncompliance among the elderly population varies from 25% to 95% (Murray, Darnell, Weinberger, & Martz, 1986; Rosenberg, 1976). This rate of noncompliance is of particular note since over 90% of the elderly population is non-institutionalized and manage most aspects of their own health care (Carnevali et al., 1986). Noncompliance can lead to increased severity of the disease process, disability, and increased health care costs to the individual and third party payers (Haynes, Taylor, & Sackett, 1979). Therefore, to provide effective care for the elderly client, it is important for health care

providers to understand compliance behaviors and the variables that can influence these behaviors.

In the 1980's, the influence of self-concept on health behaviors and compliance was studied. Burns (1986) studied adult non-insulin dependent diabetics and found a relationship between high levels of self-concept and compliance behaviors. Hallal (1982) looked at the relationship between self-concept and breast self-examination (BSE) in adult women and found that self-concept had predictive power for BSE. Andreoli (1981) found no difference between self-concept and compliance behaviors in a group of adult hypertensive clients. These studies, designed to address the influence of self-concept on compliance, were exploratory in nature, and none focused on the elderly. Additional study and attention are needed to determine to what degree self-concept influences compliance in the elderly.

Increased longevity and improved quality of life are important goals for elderly persons in society. Both factors are influenced by wellness and, to some degree, by compliance with the health care regimen in order to maintain\attain optimum levels of health. Determining the effect of self-concept in compliance in the elderly is one attempt to add to the body of knowledge on compliance and to ultimately improve health care.

Problem of Study

Noncompliance with the health care regimen is a problem in the elderly population. Researchers have extensively evaluated the relationship between compliance and multiple variables such as levels of social support, health beliefs, length and complexity of the health care regimen, satisfaction with care, locus of control, and self-esteem (Martson, 1970). However, research designed to evaluate the effects of self-concept on compliance behaviors has been limited and almost nonexistent among elderly populations. The research question is as follows: After the influence of demographics, social support, health beliefs, and satisfaction with care has been removed, to what extent does self-concept explain the degree of compliance with the health care regimen in elderly diabetic clients?

Rationale for Study

Since the 1940s, researchers have investigated compliance, and findings from these studies have identified variables that influence this concept (Koltun & Stone, 1986). Compliance behaviors have been found to be related to social support, health beliefs, complexity and duration of health care regimen, satisfaction with care, and more recently, self-concept. Of the compliance studies reported, only three were found to have focused on self-concept as one

of the major variables (Andreoli, 1981; Burns, 1986; Hallal, 1982). No studies related to the elderly were found in which the effect of self-concept on compliance was investigated. Elderly people are at risk for chronic diseases and disabling conditions. Changes in health status and functional abilities have been shown to negatively influence self-concept (Kermis, 1986). Low self-concept and chronicity have been found to affect compliance behaviors (Burns, 1986; Haber, Leach, Schundy, & Sideleau, 1982; Hallal, 1982). Since the elderly are at risk for experiencing chronic illnesses, lowered self-concept, and noncompliance, a study evaluating the relationship between self-concept and compliance would be useful.

Increased patient compliance has the potential to reduce the personal as well as the financial costs of illness. Elderly clients who can stay at home and care for themselves are physiologically and psychologically safer than those residing in health care institutions. Kayne and Cheung (1973) reported that medication errors are more likely to occur in extended care facilities than in the home. In addition to financial and safety considerations, institutionalization has also been found to decrease self-esteem and locus of control in the elderly (Taft, 1985).

With health care costs currently approaching 12% of the

gross national product (GNP) and projected to reach 15% of the GNP by the year 2000 (Ward, 1988), the financial burden on society and individuals is enormous. Funding future health care costs along with Medicare will become increasingly difficult as the population ages and fewer workers are available to contribute to the tax base (Easterbrook, 1987). Unless health care clinicians and researchers, including nurses, find successful ways to decrease the cost of illness, very serious financial crises loom ahead.

Nurses have a greater opportunity to impact health care behaviors than any other health professional. They spend the most time with the client and are responsible for assessment of psychosocial and environmental factors, patient teaching, and evaluation of learning and compliance (ANA, 1976). Nurses can assist the client to develop self-care systems that allow for independence, improved quality of life, and increased sense of control. Nurses can also initiate crisis intervention. If a crisis such as illness lowers self-concept, resolution of the crisis can stabilize the clients' previous level of self-concept and improve compliance. Health care provider/patient relationships in which the patient is a "mutual participator" have been found to be the most productive in accomplishing compliance to health care regimen (Aucion, 1990; Fink, 1976).

Conceptual Framework

The framework used in this research project was the Neeley Interactive Self-Concept Model of Nursing. The Neeley Interactive Self-Concept Model of Nursing was influenced by the works of Dracup and Meleis (1982) and Mead (1934).

Overarching Theoretical Framework

Symbolic interaction (SI) theory was used as the umbrella framework for the development of an interactive concept model. Rose (1962) described George Herbert Mead's theory on SI as a theory which explains socialization of individuals into various cultures through the use of symbols. SI has its developmental roots in Gestalt theory.

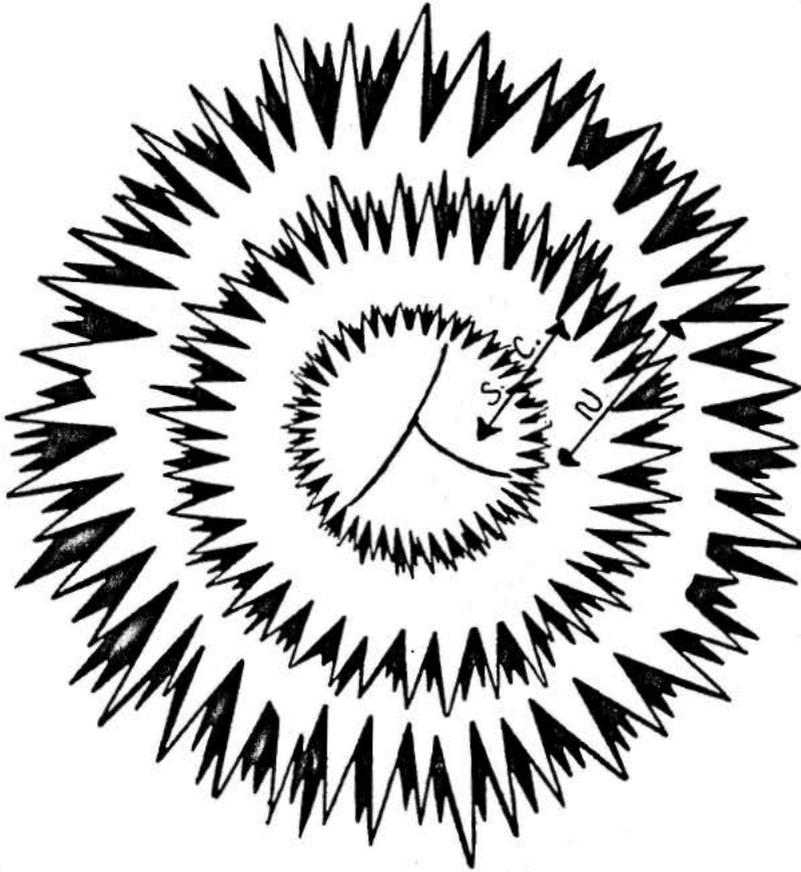
The assumptions of the theory are:

1. Man lives in a symbolic environment as well as a physical environment.
2. Through symbols, man has the capacity to stimulate others in ways other than those in which he is himself stimulated.
3. Through communication of symbols, man can learn huge numbers of meaning and values--and hence ways of acting--from other men.
4. The symbols do not occur only in isolated bits, but often in clusters, sometimes large and complex.
5. Thinking is the process by which possible symbolic solutions and other future courses of action are examined, assessed for their relative advantages and disadvantages in terms of the values of the individual, and one of them chosen as action.

(Rose, 1962, pp. 5-12)

Explanation of Model

The interactive self-concept model defines the four paradigms of nursing and serves as an organizing framework for nursing care (Figure 1). People are seen as rational, purposeful, and ultimately responsible for their own health behaviors. They are in continuous interaction with their environment and use adaptation to maintain a state of dynamic equilibrium. Their perceptions of environmental stimuli affect their self-concept. Self-concept in turn influences health care behaviors. In this model, people, in concert with nurses, set goals based on perception and self-concept attributes. The outcome goals for each interaction have the potential to differ because of the uniqueness and the perceptions of the involved parties.



Legend:

 1st inner ring	=	Person
2nd inner ring	=	Internal environment which includes genetic inheritance, Circadian rhythms, self-concept, motivation, knowledge, locus of control, and attitudes, values, and beliefs
3rd ring	=	External environment which includes psychological, sociocultural, and physical factors
	=	Nurse
	=	Self-Concept

Figure 1.

Neely's Interactive Self-Concept Model
of Nursing

Person

People are biopsychosocial beings whose distinguishing characteristic is their ability to reason. They strive for self-fulfillment and desire to find meaning in life. Their actions are purposeful and are guided by their values and beliefs and the mores of the society in which they live.

Self-concept is defined as perception of self and represents one's belief about self-worth and competence. Self-concept is influenced by the internalization of stimuli from the external environment and directly affects behavioral responses to stimuli. Self-concept also influences health promotion and maintenance practices.

People are social creatures who interact with families, groups, and communities according to their values and standards. The ability to successfully assume societal roles is known to be dependent on innate characteristics, the influence of prior experience, and the interaction with self-concept. Society is also responsible for developing and maintaining a safe external environment that fosters the growth and development of its members.

Environment

The environment is inclusive of all stimuli that could potentially impact on the individual. A person's external and internal environments interact continuously in order to

maintain a state of dynamic equilibrium. The internal environment, represented by the first inner ring of the model, consists of multiple factors that regulate behavioral responses. Those factors include genetic inheritance which influences intelligence and determines gender and race, Circadian rhythms which influence activity level, and age which influences growth and developmental stages. Gender, race, age, and activity level render a person susceptible to certain diseases. Attitudes, values, beliefs, motivation, knowledge, creativity, locus of control, and self-concept are other factors in one's internal environment that influence how one will respond to stimuli.

The external environment, represented by the second inner ring of the model, consists of physical, psychological, and socio-cultural components. The physical environment includes gravity, light and sound waves, meteorological stimuli, climatic stimuli, and physical resources such as shelter, sanitation, and food. The psychological environment consists of a person's perception of the environment which includes the perception of feedback given by others. The sociocultural environment consists of a person's family and social group, social role, and shared values and norms. Social entities such as government, educational institutions, and access to health care are other environmental factors.

Health

Health is viewed as a multifaceted and dynamic state in which adaptive mechanisms respond to alterations in the person's external and internal environment. Health is concerned with psychosocial and physical characteristics of the person. Health is defined as the ability to function in a manner that is acceptable to the person and the group in which the person lives. The individual has the primary responsibility for promotion and maintenance of health and, therefore, must play an active role in health care systems.

Nursing

Nursing is a practice discipline whose goal is to assist individuals, families, and communities to develop systems of care that will promote, achieve, and maintain health potential. Nursing as a discipline can also be viewed as an art and science with a body of knowledge based on that which is unique to nursing. Appropriate theories and principles support and refine the practice of nursing. When viewed from the perspective of this model, each paradigm--people, environment, health and nursing--is a contributor to the knowledge base which is nursing and to the interactions on which this model are based.

A dimension of role in this model is that of assigned and assumed roles of the nurse based on experience (Dracup &

Meleis, 1982). Assigned roles of nursing are caregiver, teacher, researcher, and health promoter. Assumed roles are thought to vary with situations and the unique characteristics and abilities of the individual nurse.

From the perspective of this interactive model, the nursing process is viewed as a scientific and systematic approach to problem solving. It encompasses assessment, planning, intervention, and evaluation. The outcome of the problem-solving process is influenced by the perceptions of people and nurses.

Professional nursing practice can be conceptualized as a constellation of interactions between the nurse, people, and environment whose purpose is to promote health.

Assumptions

Based on the conceptual framework, the following assumptions were applicable in this study:

1. Self-concept is a composite of beliefs, feelings, and values that one holds about oneself.
2. Perception of environmental stimuli affects self-concept.
3. Health behaviors are influenced by self-concept.
4. People are rational, purposeful, and ultimately responsible for their own health behaviors.

Research Questions

The following research questions were developed to investigate the effects of self-concept on compliance behaviors.

1. What is the relationship between compliance with a health care regimen and self-concept in elderly diabetic clients?
2. After the influence of demographics, social support, health beliefs, and satisfaction with care have been taken into consideration, to what extent does self-concept explain degree of compliance with health care regimen in elderly diabetic clients?

Definition of Terms

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

1. Compliance: "the extent to which a person's behavior coincides with medical or health advice" (Haynes, Taylor & Sackett, 1979, p. 1).
Operationally defined, compliance is a specific value of glycosylated hemoglobin (HbA_{1c}) in a peripheral blood sample.
2. Demographics: characteristics of the sample (Morris, 1979). Operationally defined,

demographics are the variables of sex, age, race, economic status, length of illness, complexity of health care regimen, education and religious preference as measured on the Demographic Information Questionnaire.

3. Health beliefs: perceptions regarding the susceptibility or nonsusceptibility to a disease process (Becker, Maiman, Kirscht, Haefner, Drachman, & Taylor, 1979). Operationally defined, health beliefs are a score on the Health Belief Model (Hurley, 1990).
4. Satisfaction with care: a feeling that the health care providers conform to expectations regarding amount of information given, patterns of communication, and expectations (Chang et al., 1985). Operationally defined, satisfaction with care is a score on Attkinson's Client Satisfaction Questionnaire (Attkinson, 1987).
5. Self-concept: an estimation of self in regards to identity, worth, and behavior from an internal and external frame of reference (Fitts, 1965). Operationally defined, self-concept is a score on the Tennessee Self-Concept Scale.
6. Social support: "interpersonal interactions that produce a sense of belonging" (Muhlenkamp &

Sayles, 1986, p. 334). Operationally defined, social support is a score on the Personal Resources Questionnaire, Part II (Brandt & Weinert, 1981).

Limitations

The following limitation of the study were identified:

1. Generalization beyond the sample cannot be made because a non-random sampling procedure was used (Abdellah & Levine, 1979).
2. Subjects who respond in a self select study represent a sample bias (Abdellah & Levine, 1979).
3. Nonexperimental study prohibits causal inferences (Abdellah & Levine, 1979).

Summary

The need for research concerning the role of self-concept on compliance behaviors among the elderly was introduced in this chapter. The rationale clearly demonstrated the need for a study focused on the influence of self-concept on compliance and the societal benefits that could eventually occur. Increased compliance with a health care regimen among the elderly has the potential to lengthen life span, improve quality of life, and decrease health care costs.

The conceptual framework developed by the researcher was described and used to formulate the research questions. The study is designed to quantitatively explain the influence of self-concept on compliance behaviors.

CHAPTER 2

REVIEW OF THE LITERATURE

Literature, theories, and research pertaining to compliance of individuals with prescribed health care regimens are discussed in Chapter 2. Definitions and measurement of compliance are addressed first. Next the influence of old age on compliance will be explored in a review of the literature pertaining to research studies with elderly populations and then elderly diabetic populations. Psychosocial variables of self-concept, health beliefs, social support, and satisfaction with care will be addressed as they relate to compliance. Since the study population is elderly diabetic individuals, the emphasis of the review will be on these topics.

Compliance

Compliance is a multifaceted aspect of human behavior. As defined previously, compliance is "the extent to which a person's behavior coincides with medical or health advice" (Haynes et al., 1979). Numerous studies to evaluate the effects of variables on compliance have generated contradictory results. For every study that shows a relationship between a variable and compliance, there is a study that demonstrates no support (Becker, Maiman, Kirscht,

Haefner, & Drachman, 1979; Koltun & Stone, 1986). Variables such as age, gender, socioeconomic status, health status, complexity of health care regimen, length of illness, education, intervention, and psychological traits have been studied extensively with experts in the health care field being unable to agree as to which variables or combination of variables have an influence on compliance (Stewart & Caranasos, 1989). What has been established is that with compliance to health care regimens individuals are more likely to lead healthier and more productive lives.

Conceptual frameworks and models to understand, predict, and influence compliance behaviors have been proposed. Models, such as the Health Belief Model (Becker, Drachman, & Kirscht, 1974), discussed later in this review and Orem's Self-Care Deficit Theory of Nursing (Orem, 1985) are often used as the framework for research studies. Dracup and Meleis (1982), in their proposed unified framework of compliance, identified four components of role enactment of compliance behaviors. The first component is the demonstration of behaviors necessary to carry out the health care regimen. Barriers and benefits to role enactment as well as length and complexity of the health care regimen are said to influence compliance role enactment. The second component of the unified framework is self-concept which is inclusive of an individual's roles.

Variables such as locus of control, attitudes towards illness, perceived susceptibility, and personality traits are considered. Complimentary roles are the third component in which cues from others influence compliance role enactment. Family members, social groups, and health care providers give cues to support or modify compliance behavior. The final component is evaluation of role enactment by all involved parties. The extent to which compliance behaviors are met depends on how valuable they are judged to be by the client and if they are validated by significant others and health care providers. The authors proposed that all four components of role enactment must be present in the individual for compliance to occur.

The measurement of compliance has proven to be difficult. Traditional methods have included self report measures, significant other reports, pill counts, physiological measures such as serum blood levels and blood pressure recordings, health care provider report, and direct observation methods. Each of these measures has proven unreliable in research because of incorrect or biased reporting and/or individual variations which alter the physiological response to medications or treatment (Hilbert, 1985; Martson, 1970; Orme & Binik, 1989).

Compliance in the Elderly

Research that examines the effects of old age as well as cognitive and/or physical variables will be addressed in this section. Research that explores the influence of psychosocial variables will be discussed later.

Cooper, Love and Raffoul (1982) used descriptive analysis to examine drug use by older people. Prescription nonadherence was classified into behavioral and motivational categories. The sample consisted of 111 non-institutionalized subjects between the ages of 60 to 90 years. Women made up 59% of the sample. Forty-eight subjects (43%) reported nonadherence to one or more prescriptions. Thirty-four (78%) of the non-adherent group reported that their nonadherence was intentional. Reasons given were: does not need medication (52%); side effects (15%); need more than the prescribed dose (4%). Unintentional nonadherence was mainly due to forgetting. A comparison of the adherent and non-adherent groups found no difference between the two groups in the variables of sex, race, education, income level, living situation, diagnoses, and number of drugs used. However, among the non-adherent group, those who had intentional nonadherence were significantly different in the number of pharmacies they used ($X^2 [1, N = 107] = 3.02, p = .082$) and the number of prescribing physicians they saw ($X^2 [1, N = 108] = 9.71, p$

=.0018). The researchers concluded that patients who used multiple pharmacies and/or physicians were reluctant to rely on one individual or source and wanted more individual control.

Klein, German, McPhee, Smith, and Levine (1982) explored the relationship between health knowledge and medication compliance in the elderly. A sample of 545 subjects was interviewed one month post discharge from John Hopkin's Hospital. Of the 545 subjects, 139 were 65 years of age or older. Compliance was measured using a self-report method. Data analysis revealed that 72% of the younger subjects could respond correctly when asked about the reason for their hospitalization but only 50% of the older subjects could. Sixty-nine percent of the younger subjects could describe the purpose of their prescription medication while only 55% of the older subjects could. No significant relationships between knowledge and compliance behaviors were found. The findings supported that while elderly clients may know less about their disease process and drug purpose, there was no difference in the compliance behavior in the young and elderly subjects.

Factors contributing to noncompliance in the elderly were studied using a sample of 140 public housing tenants who were 65 years of age or older (Murray, Darnell, Weinberger, & Martz, 1986). Noncompliance was defined as

"continual nonadherence to the directions on the prescription container label" (p. 148). Sixty-nine (49%) of the subjects were classified as compliers and 71 (51%) of the subjects were classified as noncompliers. Demographic variables associated with noncompliant subjects were sex with females being more noncompliant ($X^2 [1, N = 140] = 7.64, p \leq .01$); number of medical problems with five or more problems being significant ($X^2 [1, N = 140] = 5.04, p \leq .05$); and reported problems with medications ($X^2 [1, N = 139] = 4.66, p \leq .05$).

Sands and Holman (1985) evaluated the effect of knowledge on compliance in 93 elderly individuals who had hypertension. The researchers could not support the hypothesis that knowledge of hypertension and related self-care activities increased compliance behaviors. The study results did find that compliance and age were inversely related, with the older the subject the less reported compliance.

Two studies were conducted to examine the relationship between medication regimen complexity and adherence using an elderly population (Conn, Taylor, & Kelly, 1991). Inclusion criteria included clients over 65 years of age, non-institutionalized, who had at least three prescriptions, and no psychiatric diagnosis. The first study was conducted with clients who had recently been discharged from hospitals

in two midwestern states. The sample size was 178. Medication adherence was measured by pill counts and self-report. Medication regimen complexity was measured using a Medication Complexity Index (MCI) developed by one of the authors. A high MCI score indicated a more complex regimen. A negative correlation was reported between MCI scores and age ($r_s = -.25, p \leq .001$). MCI scores and medication name knowledge were correlated ($r_s = -.21, p \leq .004$). MCI scores were not related to adherence ($r_s = -.13, p \leq .08$).

The second study was conducted with subjects who had not been hospitalized within the past six months. Subjects were chosen by random selection from one county of a midwestern state. Inclusion criteria was the same as in study one. A sample size of 98 was used. Adherence and complexity of medical regimen were measured in the same manner as the previous study. MCI scores and adherence were not correlated ($r_s = -.17, p \leq .08$) MCI scores and age were not correlated ($r_s = -.16, p \leq .12$) However, MCI scores and self reported health appraisals were again correlated at ($r_s = -.36, p \leq .0003$). In both studies, the most frequent reason given for nonadherence was forgetting to take medication.

Compliance in the Diabetic Elderly

Diabetes is a chronic illness that requires life long compliance to diet, medication, and monitoring of symptoms in order to prevent and/or delay complications from the disease process (Guthrie, 1988). The regimen is complex, labor intensive, and expensive. Elderly people, as a group, have greater difficulty adhering to the diabetic care regimen because of lower educational levels, impairments with cognition, physical impairments associated with age such as poor eyesight, decreased levels of social support and income (Tu, McDaniel, & Gay 1993). This section covers the reported research on the effects of age and compliance to diabetic regimens.

Quality of life issues were studied in 20 diabetic patients who were 60 years of age or older (Gilden, Casia, Hendryx, & Singh, 1990). The impact of diet, medication, monitoring, and general factors on quality of life were measured through self-report questionnaires. Patients who used self-monitoring of blood glucose (SMBG) reported better medication compliance than those who did urine testing. This finding supported the use of SMBG in the elderly. Both groups reported that diabetes and related self-care activities did not significantly interfere with their lifestyle.

Connell (1991) conducted a study to examine the effects of the psychosocial aspects of diabetes on older adults. Adults over the age of 60 ($N=191$) with the diagnosis of NIDDM were in the study. The sample reported a high level of understanding of diabetes and the relationship between poor control and complications. The sample perceived less problems and fewer lifestyle impact from diabetes than comparison samples of younger diabetics. Specifically, they perceived fewer barriers to adherence, less complex regimens, and fewer symptoms of metabolic control. However the sample reported more chronic illness ($t [16,337] = -5.33, p \leq .0001$); lower levels of physical health ($\chi^2 [4,191] = 14.86, p \leq .01$); and higher levels of depression ($t [649] = -7.8, p \leq .0001$) than a comparison group of older people without diabetes.

Adherence to one component of a diabetic treatment regimen as it related to other areas was explored by Orme and Binik (1989). The study was based on attribution theory with the hypothesis being that others would see the patients as more consistently adherent than the patients would themselves. Adherence to weight control, medication schedule, symptom reporting, and urine and blood testing were measured by self report, significant other report, and health care provider report. Seventy-seven percent of the participants claimed perfect adherence to their medication

regimen which confounded the data analysis. Adherence to one aspect of the regimen was reported to be independent of other regimen demands. Rating difference between health care providers, significant others, and clients' perceptions of adherence were not supported. The researchers reported that level of adherence appeared to be a function of a specific health care regimen.

Hulka, Cassel, Kupper, and Burdette (1976) explored communication, compliance, and concordance between physicians and their patients concerning medication activities. Forty-six physicians and 357 patients with either diabetes mellitus or congestive heart failure made up the study sample. Medication errors were made in 58% of the patients. The authors reported that increased numbers of medications and complexity of scheduling accounted for increased errors in commission and scheduling. Physician/patient communication was a significant factor for low levels of medication errors in the congestive failure group but not in the diabetic group.

Psychosocial Variables

The impact of psychosocial variables on compliance behaviors has been extensively studied. The influence of self-concept, health beliefs, social support, and satisfaction with care will be considered here. Research

that was done with elderly and diabetic elderly will be emphasized.

Self-Concept

Dracup and Meleis (1982) identified self-concept as one of the four components essential for role enactment of compliance behaviors. The authors proposed that "compliance is maximized when there is evidence that the sick or at-risk roles have been incorporated into the self-concept of the client" (p. 34).

Fitts (1965) defined self-concept as an estimation of self in regards to identity, worth, and behavior from an internal and external frame of reference. Fitts (1972) reported that self-concept was a predictor of human behavior and that individuals with low self-concepts would be less successful complying with health care regimens than individuals with higher self-concept levels.

Research on the effect of age on self-concept has been inconclusive. Taft (1985) proposed that the elderly are at risk for lowered self esteem, a component of self-concept, due to loss of independence, roles, and socialization. A lowered self-esteem is said to lower one's perception of environmental control which in turn affects compliance behaviors.

Lee (1976) studied differences between self images and

age. Two groups of subjects who were 20-24 years of age and 60-80 years of age were asked the question, "Who am I?". The responses were then categorized according to Gordon's work on concept of self. No differences were reported in the self-concept of the two groups.

Larson, Boyle, and Boaz (1984) analyzed the relationship between self-concept and age and found that subjects who were 60 years of age and older had higher scores on the moral-ethical and family subscales. A curvilinear relationship between age and the physical subscale was found in the total group with middle aged subjects having the lowest physical scores. The researchers hypothesized that the older group had had time to adjust to the physical changes of aging, and therefore these changes had less impact on their self-concept.

Cox (1986) tested an interaction model of client health behavior on a group of 380 community-based elders. Age was seen as a direct contributor to perceived health status in the elderly. The author concluded that a positive sense of well-being contributed to how competent and how self-determining older people feel in relation to their health behavior.

Andreoli (1981) conducted a study designed to measure differences in self-concept and health beliefs in compliant and noncompliant adults with hypertension. The Tennessee

Self-Concept Scale (TSCS) was used to measure self-concepts and health beliefs were measured using a modified version of the Standardized Compliance Questionnaire (SCQ) developed by Sackett, Becker, MacPherson, Luterbach, and Haynes (1974). The sample consisted of 71 males, 41 compliers and 30 noncompliers, between the ages of 30 and 74 years of age who were outpatients at a Veteran's Administration Hypertensive Clinic. Andreoli found no difference between the TSCS scores of compliant and noncompliant subjects (t [69, 71] = .93, $t_{.05} = 2.00$). Also no differences were found between the health belief scores of the compliers and noncompliers (t [69, 71] = .48, $t_{.05} = 2.00$).

Hallal (1982) examined the relationship between health beliefs, locus of control, self-concept and the practice of breast self-examination (BSE). Health beliefs were measured using the perceived benefits and perceived susceptibility subscale of a BSE health belief tool (HBI) developed by Stillman (1977). Locus of control was measured using subscales of the Multidimensional Health Locus of Control Scale (MHLC) developed by Wallston, Wallston, and DeVellis (1978). Self-concept was measured using the TSCS. Two-hundred-seven women were in the sample of which 165 (80%) indicated that they practiced BSE. Stepwise multiple regression was used to determine which combination of variables predicted BSE. The Total Positive score of the

TSCS was the best predictor of BSE accounting for 12% of the variance ($p < .01$). Perceived benefits (HBI) and the Powerful-other subscale of the MHLC also entered the equation to explain a total of 16% of the variance ($p < .05$).

Muhlenkamp and Sayles (1986) studied the relationship between self-esteem, social support, and health practices. The researchers hypothesized that high levels of self-esteem and social support would correlate with positive health behaviors. A sample of 98 volunteers from an apartment complex were recruited. The ages ranged from 18 to 67 years with a mean of 29 years. Fifty-five of the subjects were men and 43 were women. The Coopersmith Self-esteem Inventory (1967) was used to measure self-esteem. The Personal Resources Questionnaire (PRQ), Part II was used to measure social support (Brandt and Weinert, 1981). Health practices were measured with the Personal Lifestyle Questionnaire (Muhlenkamp & Brown, 1983). Social support and self-esteem both correlated with health practices with reported $r_{xy} = .26$ and $.25$ respectively at $p \leq .05$.

Self-concept and compliance in non-insulin dependent diabetics was examined by Burns (1986). The sample was 30 subjects in which fasting blood sugars (FBS) and TSCS scores were analyzed. The author found a difference between the TSCS scores of the compliers and noncompliers ($t = -2.53$, $p \leq .05$). There was also a difference between the physical

subscale scores on the TSCS between the compliers and noncompliers ($\underline{t} = -3.40, p \leq .01$). Burns also reported a positive relationship between TSCS scores and FBS levels ($\underline{r}_{xy} = .5, p \leq .05$).

Health Beliefs

Attitudes, values, and beliefs are often evaluated to predict health behavior. The most popular framework used to measure these variables is the Health Belief Model (HBM) developed by Hocbaum (1956) and expanded by Becker, Drachman, and Kirscht (1974).

The HBM is derived from Lewin's (1935) general field theory which deals with how self-concept (life space) affects action. If a person expects a positive outcome from a certain behavior, the expectation (tension) will motivate the person to exhibit that behavior. Atkinson (1964) applied the HBM in the area of achievement and hypothesized that action is based on the person's motivation to achieve success, the value of the goal sought, and the perception of likelihood of success.

According to Becker et al. (1974), individual perceptions and modifying factors are used to predict action. If people perceive they are susceptible to a disease and that disease is serious, they will consider taking preventative action. The benefits and barriers to

taking the action are weighed, and if the benefits outweigh the barriers, there is a high likelihood of positive health behaviors.

Methodological concerns have been raised about the measurement of this psychosocial concept in research studies. A review of the literature found that health beliefs are usually measured by modifying the Standard Compliance Questionnaire (SCQ) developed by Sackett, Becker, MacPherson, Luterbach, and Haynes (1974). Researchers have noted that the lack of disease specific HBM questionnaires have confounded the validity of the research on compliance and health beliefs (Redeker, 1988). In response to this criticism, diabetes-specific tools such as the ones developed by Given, Given, Gallin, and Condon (1983) and Becker and Janz (1985) have been developed.

No published studies were found that explored the relationship of health beliefs and compliance with an elderly population. However, Weissfeld, Brock, Kirscht, and Hawthorne (1987) measured the stability of the HBM scales across populations. The sample consisted of 2,802 subjects between the ages of 18 and 59+. The researcher reported that the reliability estimates of the HBM appeared to be independent of age, sex, or gender.

Research which has investigated the relationship between compliance in chronic illness and health beliefs has

generated conflicting results. Studies examining the effects of health beliefs and compliance to hypertensive regimens found no correlation among the variables (Andreoli, 1981; Cronin, 1986; De Von & Powers, 1984). Research on compliance to end-stage renal failure protocols and health beliefs have actually found negative correlations between the constructs (Bolin & Hart, 1982; Cummings, Becker, Kirscht, & Levin, 1982).

Studies designed to examine the relationship between health beliefs and compliance to diabetic care regimens, however, have shown positive correlations between the two variables (Becker & Janz, 1985; Redeker, 1988). Alogna (1980) investigated health belief's influence as a predictor of compliance behaviors in a diabetic population. Fifty subjects who were obese and had non-insulin dependent diabetic mellitus were in the study. Health beliefs were measured using a modified SCQ, and compliance was measured by glucose levels and weight loss. There was a positive relationship between health beliefs and compliance scores with a reported ($r_{xy} = .50$, $p \leq .01$).

Cerkoney and Hart (1980) looked at the relationship between health beliefs, using a modified SCQ, and compliance behaviors, which were measured by self-report and direct observation methods. Thirty diabetics were in the study with ages ranging from 18 to 73 years with 80% being 50

years or older. Total HBM scores and compliance scores were correlated at ($r_{xy} = .50, p \leq .01$).

Harris, Skyler, Linn, Pollack, and Tewksburg (1982) tested the HBM in a group of diabetics. The sample consisted of 50 adult diabetics. The researchers reported a significant relationship between perceived susceptibility, severity, and benefits with physiological measures of diabetic control. Harris, Linn, Skyler, and Sandifer (1987) developed a Diabetes Health Belief Scale (DHBS) based on the SCQ and tested it using a sample of 280 men who were outpatients at a diabetic clinic at a Veteran's Administration Hospital. Compliance was measured using self-report and direct observation methods. Control of diabetes was measured using 24-hour urine, fasting blood sugars, fasting triglyceride levels, and hemoglobin A1 levels. The best predictor of control was perceived severity which accounted for 9% of the variance with perceived benefits accounting for an additional 6% of the explained variance. The researchers pointed out that the correlation between compliance and control was only $r_{xy} = .41$ which supported methodological concerns of measuring compliance.

Wooldridge, Wallston, Graber, Brown, and Davidson (1992) measured health beliefs and compliance behaviors in a sample of 189 adult diabetic outpatients pre and post

educational treatment that attempted to modify health beliefs. Compliance was measured by self-report and glycosylated hemoglobin levels. Those subjects who had NIDDM had a difference in HbA_{1c} levels from pre to post treatment at $t = 7.1(145)$, $p \leq .000$.

Social Support

The relationship between social support and compliance has been extensively researched. Haynes and Sackett (1976) reviewed 22 research articles on this topic and found only one study that refuted the correlation between social support and compliance. Levy (1986), in a review of the literature that addressed the role of social support and compliance, found 33 studies showing a positive relationship between the two variables, one demonstrating a negative relationship, and 18 demonstrating no relationship.

Methodological issues surrounding the measurement of social support include concerns that there are a number of definitions of social support, some tools measure social network as well as social support, and most social support instruments do not have established reliability and validity (Levy, 1986; Lindsey, 1988; Norbeck, 1988; Weinert, 1988). Thoits (1982) criticized the research on social support because the research is not longitudinal. Therefore social support is usually measured after a life event takes place,

and the interaction on that event on social support is not accounted for. Thoits also criticized the research because the relationship between life events, social support, and psychological status has not been explored.

Although definitions of social support may vary, Norbeck (1988) identified a basic conceptual framework that is the common underpinning for most of the research in this area. Norbeck reported that the relationships and interrelationships between stress, health behaviors, and social support are the common components of the models. Weiss (1964) defined the dimensions of social support to include: 1) social integration, 2) opportunity for nurturance, 3) obtaining of guidance, 4) reassurance of worth, and 5) provision for intimacy. Quality rather than quantity of social support was emphasized. Kahn (1979) conceptualized social support as having the dimensions of empathy, nurturance, encouragement, information, instrumental help, recognition of competence, validating behaviors, and sharedness and reciprocity.

The elderly are at risk for decreased access to social support in a time of their lives when they need it most (Ryan & Austin, 1989). The loss of significant others, retirement, and the confinement and isolation that is often associated with chronic illness puts them at risk for decreased access to others. Also with recent changes in

American culture, they are often asked to give more social support than they receive.

The relationship between social support, adherence, and morale in a group of 191 NIDDM community-based elderly was examined by Connell, Fisher, and Houston (1992). Social support was measured by the Social Provisions Scale developed by Russell and Cutrona, 1948 (cited in Connell et al. 1992) and the Diabetes Specific Support Scale (Davis, Hess, Van Harrison, & Hiss, 1987). Self-care activities were measured by the Diabetes Care Profile (Hess, Davis, Van Harrison, 1986). Metabolic control was measured by glycosylated hemoglobin levels. Of the 110 women in the study, metabolic control was not related to social support. Of the 81 men in the study, scores on the Diabetes Specific Support scale were said to indirectly affect metabolic control by increasing self-care behaviors.

Wilson and Pratt (1987) investigated the impact of diabetes education and peer support on compliance behaviors in a group of 79 elderly subjects with NIDDM. Glycemic control was measured by glycosylated hemoglobin levels and peer support was measured by the Arizona Social Support Schedule developed by Barrera (1981). A three-group quasi-experimental design was used with one group receiving education only, the second group education and peer support, and the third group acting as the control. The researchers

reported that the group who received education and peer support showed a moderate but not significant reduction in weight and glycosylated hemoglobin levels post-intervention while the other two groups did not.

The influence of a supportive family on adherence and metabolic control was studied in 72 subjects (Schafer, McCaul, & Glasgow, 1986). Adherence was measured by self report. A Diabetes Family Behavior Checklist (DFBC) developed by the researcher was used to measure social support. Negative DFBC scores were predictive for poor adherence behavior in the areas of glucose testing ($r_{xy} = -.37, p = .05$), dietary adherence ($r_{xy} = -.42, p = .05$), and insulin injection at $r_{xy} = -.42, p = .05$).

Kaplan and Hartwell (1987) studied the differential effects of social support and social network on physiological outcomes in men (32) and women (44) with NIDDM. The Social Support Questionnaire developed by Sarason, Levine, Bashen, and Sarason (1983) was used. The researchers found that glycemic control was correlated with social support satisfaction in women ($r_{xy} = -.32, p \leq .05$), but the men who had increased levels of blood glucose also indicated higher levels of social support satisfaction ($r_{xy} = .36, p \leq .05$). Social support network size was also reported to predict success for women, but not men, with adherence in a group intervention program.

Shenkel, Rogers, Perfetto, and Levin (1985) tested Fishbein's (1967) model of behavior to predict compliance intentions. Forty-one subjects with insulin dependent diabetes mellitus (IDDM) made up the sample. The researchers reported that the strongest predictor of behavioral intentions was the importance of the behavior to the significant other ($R = .36$, $p \leq .01$).

McCaul, Glasgow, and Schaffer (1987) studied the effects of knowledge, expectancies, skills, and environmental supports on predicting compliance behaviors. Compliance was measured using self-reported data. Environmental support was measured using the Family Environmental Scale (Moos & Moos, 1981). Environmental support was shown to predict the adherence behaviors of glucose testing and insulin administration at $p \leq .05$.

Schlenk and Hart (1984) reported on a study that analyzed the relationship between social support, locus of control, and health value. The sample consisted of 30 adults with diabetes mellitus. Social support was measured by a diabetes specific instrument developed by the researchers. Social support was reported to explain 37% of the variance in compliance ($p < .005$) while health locus of control explained an additional 13% of the variance ($p < .001$).

Satisfaction With Care

The effect of satisfaction with care on compliance to therapeutic regimens has been studied since the 1960's. Korsch and Negrete (1972) reported that clients who had a highly satisfactory relationship with their physicians were three times more likely to follow their advice than those who did not. Factors that have been identified with satisfaction of care are the client's ability to communicate with health care providers, confidence in the skill of the care provider, and the ability to modify the health care regimen into their lifestyle (Carey, 1984; DiMatteo & DiNicola, 1982; Haug & Lavin, 1978).

Elderly people have more chronic conditions that require continuing care. About 85% see a physician at least one time a year (Rice & Feldman, 1983). Relationships with health care providers who are empathetic to the client and the client's perspective are reported to increase satisfaction with care and participation in treatment regimens (Squier, 1990).

Thorne and Robinson (1989) conducted a multiphase, qualitative study on the ongoing relationships between 77 chronically ill patients and health care providers. The researchers reported that the patient's relationships with health care providers went through three stages: naive trust, disenchantment, and guarded alliance. In the guarded

alliance stage the researchers identified the main variable was reconstructed trust which accounts for patients' trust in the health care provider and belief in their own competence.

Kleiman and Clemente (1976) investigated the relationship of race, sex, socioeconomic status, and size of community as they influenced individuals' perceptions of health care providers. The data were taken from the 1974 General Social Survey conducted by the National Research Center at the University of Chicago. The sample consisted of 1484 individuals of whom 252 were 65 years of age or older. The researchers reported that elderly clients of low socioeconomic status have the least amount of confidence in their doctor.

Nuttbrock and Kosberg (1980) investigated older persons' attitudes towards doctors and the consequences of those attitudes as to whether or not the person sought medical help. One hundred twenty-two subjects who were 60 years of age or older participated in the study. Multiple regression analysis revealed that when physicians are given low affectivity ratings, the older person is less likely to seek health care assistance from them, standardized $B = -.15$ ($p \leq .05$).

Chang, Uman, Linn, Ware, and Kane, (1985) explored the effects of technical care, psychosocial interaction, and

patient participation on the intent to adhere to a plan of care. Twenty-six senior nutrition sites in a metropolitan area were used. The sample size was 268 women between the ages of 56 and 89 years with a mean age of 70.9. All of the subjects were non-institutionalized with 28.4% being married and 56% widowed. The research method was a 2 x 2 x 2 quasi-experimental design with subjects viewing video tapes that depicted different combinations of high and low levels of technical quality, psychosocial aspects, and patient participation in care decisions. Courtesy of care was held constant. Subjects were asked to rank their intent to adhere to the plan of care shown in the video as if they had been the patient in the situation. The authors reported that high psychosocial care resulted in significantly greater intent to adhere. Analysis of covariance was done in which the subject characteristic variables and the independent variables of technical quality, psychosocial care, and patient participation were examined for their effect on intent to adhere. The subject characteristics contributed to intent to adhere with a reported ($F(5,268) = 6.22, p \leq .001$). The independent variables were not significant. Specific subject characteristics that correlated to adherence were pre-existing satisfaction with health care, high social network, being a widow, and perceived importance of technical quality of care provided

by the nurse. Patient participation in the plan of care was not significantly related to intent to adhere in this study.

Hall and Dornan (1988 a,b; 1990) performed a meta analysis on 221 studies that reported relationships between satisfaction and medical care. The authors reported that young physicians with high technical and interpersonal skills and high ratings in affective quality were seen as more desirable by the samples. Subjects with better health and who had received care from the same provider over a period of time rated themselves as more satisfied with their health care provider than the other subjects. Patients' ages were reported as the most consistent correlate with satisfaction when compared with other demographic variable. Adult samples were more satisfied with their medical care than pediatric ones. Hall and Dornan (1988b) reported that elderly patients, as a group, were not well represented in the satisfaction literature.

Summary

The understanding of compliance behaviors is of great importance to nurses and other health care providers. Self-concept appears as a key factor in theories explaining compliance, yet studies testing the effects of self-concept have not been conducted. The literature review also highlighted the fact that research involving compliance in

elderly populations is limited. As the population of America steadily grays, understanding of compliance should help improve quality of life and decrease health care costs for citizens 65 years of age and older.

CHAPTER 3

PROCEDURE FOR COLLECTION AND TREATMENT OF DATA

A descriptive correlational design was used for this study. Descriptive correlational research refers to a nonexperimental approach that allows for the investigation of interrelationships among variables without hypothesizing a causal effect (Abdellah & Levine, 1979). Descriptive studies are frequently used to describe relationships among variables measuring sociological and psychological variables that influence behaviors. The design allows for the measurement of variables without any attempt to control the research setting or manipulate the variables. Subjects were not assigned to groups.

Setting

The setting for this study was a large metropolitan city of approximately 3 million people located in the Southwestern area of the United States. Clients from two privately-owned diabetic clinics located in the northwest and south central areas were used. Clinic consent forms are in Appendix A. The clinics were staffed by a physician and a certified diabetes educator in addition to ancillary personnel. Clientele were all diabetics and varied in age between 6 and 88. Clientele represented a variety of

socioeconomic strata. Questionnaires were mailed to the addresses provided by the diabetic clinic, and each client was free to complete the questionnaire in a convenient setting and time.

Population and Sample

The population consisted of all persons over 65 years of age who had diabetes mellitus and were clients of these clinics. A total of 310 individuals made up the accessible population. Inclusion criteria for the study were:

1. Client living in an independent living situation.
2. Client able to perform self-care activities.
3. Client able to comprehend written information in English.
4. Client not currently taking the drug, Heparin.
5. Client not having the diagnosis of hemolytic anemia.
6. Client not in an acute phase of diabetes.

The sample for this study consisted of geriatric clients who were receiving health care at two clinics who met the above criteria, as determined by the clinic personnel, and who were willing to participate in the study. A nonrandom convenience sample was used. A sample of 111 elderly diabetic patients was chosen. The sample size was determined using Cohen's power formula (1983) which

determined adequacy of sample sizes for multiple regression based on power, alpha, effect size, and number of variables being studied. The values selected were power = .80, alpha = .05. Twelve variables were examined in the studies. The effect size chosen was $\underline{r}^2 = .15$. The effect size chosen was based on a previous study by Burns (1986) and Hallal (1982). Burns analyzed the relationship between self-concept and fasting blood sugar (FBS) levels in diabetics and the Pearson reported was $\underline{r}_{xy} = .5$ for high TSCS scores and low FBS. Hallal reported the relationships between breast self-examination (BSE) and self-concept. The regression analysis reported was $\underline{r}^2 = .12$ for high TSCS scores and the practice of BSE. However, when the clinics reviewed their files only 202 eligible clients were found. Seventy-five of those clients returned usable questionnaires. After consultation it was decided to go with the 75 subjects as similar clinics were not accessible in this area.

Protection of Human Subjects

The investigator complied with all of the current rules and regulations of the Human Subjects Review Committee of Texas Woman's University and the University of Texas Health Science Center at Houston (Appendix B). Informed consent was obtained from all participants. A letter explaining the study purpose, potential risks, and potential benefits and

alternatives was given to each participant (Appendix C). The name, address, and business phone number of the investigator was included along with a statement indicting that the investigator was available to answer questions or concerns about the study.

The letter stated that completion of the questionnaires indicated willingness to participate in the study. Participants were informed that they could withdraw from the study at any time without penalty. Confidentiality of data was maintained by the use of coded questionnaires. All questionnaires were destroyed after data analysis was completed. All data were reported in summary form, and subjects were not personally identified. Participation was voluntary and without financial remuneration. Benefits involved the satisfaction of assisting in health care research. Risks included client discomfort with self evaluation when answering the questionnaires. This risk was addressed by offering to discuss any discomfort the client felt at any time during the process.

Instruments

The instruments selected for this study were the Health Belief Model Questionnaire (Hurley, 1990), the Personal Resource Questionnaire (Brandt & Weinert, 1981), Client Satisfaction Questionnaire, (Larsen, Attkinson, Hargreaves,

& Nguyen, 1979), and the Tennessee Self Concept Scale (Fitts, 1965). Appendix D contains letters of permission to reproduce instruments. Demographics reported to influence compliance included sex, age, race, economic status, length of illness, complexity of health care regimen, education, and religious preference (Becker, Kaback, Rosenstock, & Ruth, 1975; Martson, 1970; Muhlenkamp & Sayles, 1986).

Health Belief Model Questionnaire

The Health Belief Model Questionnaire (HBM11) was developed by Hurley (1990) (Appendix E) to measure the health beliefs of diabetic clients. The HBM11 is based on the original diabetes Health Belief Model (HBM) which is a 76 item tool designed for diabetics (Given, Given, Gallin, & Condon, 1983). Rosenstock (1985) validated the usefulness of the HBM for understanding compliance with diabetic therapy.

The HBM11 is an 11 item Likert scale with high scores indicating readiness for diabetic self-care actions. Items are summed and the total score can vary between 11 to 55. Internal consistency and stability of the tool have been documented in a study with a sample of 269 middle-aged adults by Hurley (1990). Internal consistency was established using Cronbach alpha with an $\underline{r} = 0.80$ reported. Stability was measured using a Pearson with a reported $\underline{r}_{xy} =$

0.71.

Construct validity was established by factor analysis. The HBM11 loaded into the three factors earlier identified in the Given, et. al. tool and a HBM tool, designed for diabetics, developed by Becker and Janz (1985). The three factors identified were perceived seriousness of the disease, perceived benefits to following the regimen, and the perceived barrier to self-care actions.

The reliability estimate of the HBM11 was $\alpha = 0.14$ for this sample. Four items were negatively correlated. These items represented the seriousness subscale as identified by Hurley. The developer of the HBM11 was consulted and told of the results. Correct keying was verified and the developer had no additional reports on the reliability of the HBM11 from other researchers. The developer thought the four items were not reliable for this particular sample (A. Hurley, Personal communication, January 23, 1993).

Four researchers who had previously worked with the Health Belief Model were asked to review the HBM11 for content validity. All four had trouble with the interpretation of the four items in regards to representing seriousness. A factor analysis for this sample was then done and the question loaded into four factors, with the seriousness questions in three different factors. These questions were removed from the analysis and two factors

were then identified representing the construct of barriers and benefits to following the health care regimen.

Reliability testing was performed with the seriousness questions removed ($r = .67$). The decision was then made to use the modified HBM11 (MHBM) in this study.

Personal Resource Questionnaire

The Personal Resource Questionnaire (PRQ) Part 2 was chosen to measure social support (Appendix E). Part 2 was chosen because it is reported to measure the dimensions of perceived social support. The PRQ was developed by Brandt & Weinert (1981) and is based on Weiss' (1969) model of relational functions. Part 2 of the PRQ is a 25-item Likert scale that measures a person's perceived level of social support. The items are summed and the total score can vary between 25 to 175. Higher scores indicated higher levels of perceived social support. The PRQ is widely used in nursing research (Eyers & Ellison, 1982; Lobo, 1982; Murtaugh, 1982; and Weinert, 1982). These researchers reported alpha coefficients for Part 2 varied between $r = 0.88$ and 0.93 . The reliability estimate of the PRQ was $r = 0.91$ for this study. Construct validity was established through factor analysis. The 25 items loaded into 3 factors which represented intimacy, nurturance, and affirmation/assistance. The questionnaire has been widely used with a

variety of populations including the elderly (Muhlenkamp, et. al., 1986).

Satisfaction with Care

Satisfaction with care was measured by the Client Satisfaction Questionnaire (CSQ-8) (Appendix E). This questionnaire was developed by Larsen, Attkinson, Hargreaves, and Nguyen (1979). The CSQ-8 is an eight item Likert-scale that is summed with higher scores indicating increased satisfaction with services. The total score can vary between 8 to 32. Alpha levels ranging between $\underline{r} = 0.86$ to 0.94 for internal consistency have been reported (Attkinson, 1987). The reliability of the CSQ was $\underline{r} = 0.86$ for this study. Concurrent validity of the instrument was established by correlations with 62 clients' evaluations of their improvement and expressed feelings of approval for their health care providers (Attkinson, 1987).

Self-Concept

The Tennessee Self Concept Scale (TSCS) was developed by Fitts (1965). (Appendix E). There are two versions of the scale, a Clinical and Research Form and a Counseling Form. The Counseling Form was chosen for this study because of its ease of administration and scoring. The scale consists of 100 self-descriptive statements on which individuals rate themselves using a five-point Likert scale

ranging from completely false to completely true. The total positive scores can range from 90 to 450 with the higher scores indicating a more positive self-concept.

The TSCS is comprised of twelve subscales that measure aspects of self-concept. The scales are as follows:

1. Self Criticism: Ten mildly derogatory statements that most individuals admit as being true of them.
2. Total Positive: Reflects overall self-esteem.
3. Identity: Individuals' views of themselves.
4. Self Satisfaction: Individuals' feelings about their self-perception.
5. Behavior: Individuals' perceptions of their behavior.
6. Physical Self: Individuals' perceptions of their state of health, physical appearance, skills, and sexuality.
7. Moral-Ethical Self: Individuals' perceptions of their relationship to God and moral worth.
8. Personal Self: Individuals' sense of personal worth.
9. Family Self: Individuals' sense of worth among significant others.
10. Social Self: Individuals' sense of self in relationship to others in general.
11. Variability: Measures for inconsistency among

self perception scales.

12. Distribution: Measures certainty of self perception (Fitts, 1965).

Reliability of the TSCS has been previously documented. Internal consistency was established with a sample size of 472 yielding an $\underline{r} = .94$ (Roid & Fitts, 1991). Stability of the TSCS was established by with a sample of 60 college students and revealed a coefficient of $\underline{r}_{xy} = 0.92$ for the total score (Fitts, 1965).

Evidence of reliability for the subscales of the TSCS for this study were:

1. Self Criticism	$\underline{r} = .63$
2. Total Positive	$\underline{r} = .94$
3. Identity	$\underline{r} = .91$
4. Self Satisfaction	$\underline{r} = .79$
5. Behavior	$\underline{r} = .83$
6. Physical Self	$\underline{r} = .66$
7. Moral-Ethical Self	$\underline{r} = .83$
8. Personal Self	$\underline{r} = .81$
9. Family Self	$\underline{r} = .78$
10. Social Self	$\underline{r} = .78$
11. Variability	$\underline{r} = .62$
12. Distribution	$\underline{r} = .95$

Fitts also reported evidence of validity. Content validity was established by a panel of judges. Construct

validity was determined by correlations between the TSCS and established tests such as the Piers-Harris Children's Self-Concept Scale ($r = .80$, $N = 99$), Coopersmith Self Esteem Inventory ($r = .75$, $N = 204$), and the Rotter Internal-External Locus of Control ($r = -.63$, $N = 50$) (Roid & Fitts, 1991). The TSCS was also able to discriminate between groups such as delinquent versus non-delinquent adolescents and psychiatric clients versus non-psychiatric clients.

The reading level is reported to be 6th grade and it is estimated to take 10 to 20 minutes to complete the scale. The scale is valid for individuals who range from well adjusted to psychotic (Fitts, 1965).

Compliance

Compliance to a health care protocol for diabetes mellitus was measured by a glycosylated hemoglobin level (HbA_{1c}). HbA_{1c} is a component of hemoglobin which increases in response to prolonged hyperglycemia during the life span of the cell which is 120 days. Glycosylation of the cell is irreversible and cannot be altered by fasting or increasing medication dosage just prior to blood levels being drawn. HbA_{1c} levels are being widely used to monitor long term compliance in diabetic individuals (Cella & Watson, 1989). HbA_{1c} is routinely drawn on diabetic clients during health care visits.

One clinic determined their HbA_{1c} using the Abbott Vision Analyzer[®] with a standardized affinity method which standardizes the results to the high pressure liquid chromatography (HPLC) method. Telephone communication with Abbott's Technical Support Team indicated that the company had run correlational studies between their affinity method and HPLC and got a coefficient of variations range of 95.2% to 104.2% and that the methods were directly correlated. The reference range for the affinity values was 4.1% to 5.7%.

The second clinic used Smithkline Beechman's HPLC method run on a Diamat[®]. Their reference range was 4.4% - 6.1% of total hemoglobin. Since the Abbott lab standardized test results to HPLC, a linear transformation of the Abbott scores was done in order to compare the HbA_{1c} values of both clinics with each other (Dr. J. O. LeMaistre, Personal Communication, January 25, 1993).

Data Collection

The first clinic provided a list of all clients who met the sample criteria. The research questionnaires were then coded by the investigator, and each client was mailed a questionnaire packet at the address provided. Included in the packet were the questionnaire, a cover letter from their respective clinics encouraging participation in the study, a

letter from the investigator explaining the study, and a self-addressed, stamped envelope for the return of the questionnaire. Appendix F contains letters from the clinical agencies. A follow-up mailing was done three weeks later to those subjects who did not respond to the first mailing.

The second clinic had the investigator provide them with copies of the questionnaire, envelopes with postage, and a letter from the investigator explaining the study. The clinic personnel then coded the questionnaires and sent them. For the follow-up mailing the investigator provided the clinic with the list of returned questionnaires, by code, and the clinic again did the mail out.

The first clinic had 72 eligible clients. The first mailout yielded a return of 32 questionnaires and with the second mailout there was a return of 9. Five of the questionnaires were unusable. The return rate for the first clinic was 57%. The second clinic had 130 eligible clients. The first mailout yielded a return of 39 questionnaires and the second mailout resulted in 3 questionnaires being returned. Three questionnaires were unusable. The return rate for second clinic was 32.5%. The total return rate for the clinics was 37%.

Treatment of Data

Descriptive statistics were used to summarize the data from the demographics and questionnaires. Age, length of illness, complexity of health care regimen, and education level were described using frequencies, percentages, ranges, means, and standard deviations. Race, sex, economic status and religiosity were described using mode, frequencies, and percentages. Scores on the PRQ, MHBM, and CSQ were described in terms of frequencies, percentages, ranges, variances, means, standard deviations, and the standard error of measures. The TSCS scores were described in terms of frequencies, percentages, ranges, variances, means, standard deviations, and standard error of measure for the total scale as well as the individual subscales. A Pearson's product moment correlation coefficient was used to analyze the relationship between compliance level and self-concept score. Hierarchical multiple regression analysis was used to explain the variance of demographics, social support, health beliefs, satisfaction with care, and self-concept on compliance.

CHAPTER 4

ANALYSIS OF DATA

The sample is described by age, gender, race, educational level, length of illness, complexity of health care regimen, economic status, and religiosity. The psychosocial constructs that affect compliance are then discussed in terms of descriptive statistics. Finally, the two research questions are addressed.

Description of Sample

The sample consisted of 75 subjects who met the pre-stated selection criteria. All subjects were non-institutionalized diabetics who were over the age of 65.

Age

The mean age of the subjects was 71.97 years and the standard deviation was 5.90. The majority (71.9%) of subjects were between 65 and 74 with 12 (16%) over 80 years of age. The range was 22 years with a low of 65 and a high of 87 years. Table 1 depicts the age of the subjects.

Gender

The gender of the sample was almost evenly split with 36 (48%) of the subjects being male and 39 (52%) of the subjects being female. The mode was 2 or female.

Table 1
Frequency and Percentage of Ages of Subjects

<u>Age</u>	<u>f</u>	<u>%</u>
65-74	54	71.9
75-84	16	21.5
85-87	3	3.9
Missing	2	2.7
TOTAL	75	100.0

Race

Sixty-four (85.3%) of the subjects indicated that they were white. Eight (10.7%) reported that they were black, with 1 (1.3%) reporting a hispanic origin, and 2 (2.7%) indicating that they were in the other category.

Educational Level

The mean educational level of the subjects was 13.12 years with a standard deviation of 2.95. The range was 15 with a low of 5 years and a high of 20 years. Table 2 reflects the educational years of the subjects. Twenty-nine (38.7%) of the subjects reported more than 12 years of education.

Table 2
Frequency and Percentage of Educational
Level of Subjects

Years of Education	<u>f</u>	<u>%</u>
5-8	5	6.6
9-12	31	41.4
13-16	20	26.7
17-20	9	12.0
Missing	10	13.3
TOTAL	75	100.0

Length of Illness

The mean numbers of years the subjects were aware of their diabetic condition was 13.44 with a standard deviation of 11.7 years. The range was 66 years with a low of 1 and a high of 67. Table 3 reflects the length of time subjects knew about their diabetic condition.

Table 3
Frequency and Percentage of Length
of Illness of Subjects

<u>Years</u>	<u>f</u>	<u>%</u>
1-9	33	44.0
10-19	21	28.1
20-29	12	16.0
30-39	5	6.6
40-49	0	0
50-59	1	1.3
60-69	1	1.3
Missing	2	2.7
	75	100.0

Complexity of Health Care Regimen

Forty-six (61.3%) of the subjects reported insulin dependence. The number of daily injections varied from 1 to 3. Twelve subjects (16%) reported 1 insulin injection a day, 28 (37.3%) reported taking 2 insulin injections per day, and 6 (8%) reported taking 3 injections per day. The mean for injections was 1.15 with a standard deviation of

1.07. Twenty nine (38.7%) of the subjects did not use insulin to control their diabetes.

Economic Status

The mode for reported income levels was \$22,000.00. Table 4 describes the income level of the subjects. Thirty-nine or 52% of the subjects did not indicate their annual income on the questionnaire.

Religious Preference

Fifty-seven (67%) of the subjects reported Protestant religious affiliation. Seven or 9.3% of the subjects reported Catholicism, 5 (6.7%) reported Judaism, and 6 (8.0%) reported that they were in the other category.

Table 4
 Frequency and Percentage of Annual
 Income Levels of Subjects

<u>Dollars</u>	<u>f</u>	<u>%</u>
0-9,999	5	6.5
10,000-19,999	7	9.3
20,000-29,999	9	11.9
30,000-39,999	3	4.0
40,000-49,999	5	6.6
50,000-59,999	0	0.0
60,000-69,999	1	1.3
70,000-79,999	1	1.3
80,000-89,999	1	1.3
100,000 +	4	5.2
Missing	39	52
TOTAL	75	100.0

Psychosocial Constructs

The following is a description of the measurement of the psychosocial variables that affect compliance as supported by the literature.

Health Belief Model

The mean for the modified HBM (MHBM) was 26.84 with a standard deviation of 4.07 and a standard error of measure of 2.34. The range was 21 with a low score of 14 and a high score of 34. The total score could vary between 7 and 35. Table 5 shows the distribution of the MHBM scores. A higher score on the MHBM indicates readiness for diabetic self-care action. The MHBM, rather the HBM11, was used in the analysis since measures with low reliability degrade a multiple regression analysis (Tabachnick & Fidell, 1983).

Table 5
Frequency and Percentage of
Modified Health Belief Model

<u>Score</u>	<u>f</u>	<u>%</u>
14-19	5	6.7
20-29	53	70.6
30-34	17	22.7
TOTAL	75	100.0

Personal Resources Questionnaire

PRQ scores varied from a low of 79 to a high of 172. (Table 6) Total scores could vary between 25 to 175. The range was 93. The mean was 139.7, with a standard deviation of 18.4, and standard error of 5.7.

Table 6
Frequency and Percentage of
Personal Resource Scale

<u>Score</u>	<u>f</u>	<u>%</u>
79	1	1.3
100-110	5	6.7
111-119	0	0
120-129	12	16.0
130-139	19	25.3
140-149	17	22.7
150-159	10	13.3
160-169	6	8.0
170-172	5	6.7
	—	—
TOTAL	75	100.0

Client Satisfaction Questionnaire

Subjects reported their satisfaction with health care services using the CSQ. The mean score was 28.57 with a standard deviation of 3.35. The range was 15 with a low score of 17 and a high score of 32. Twenty-three (30.7%) of the subjects indicated a satisfaction level of 32, the highest obtainable score. The standard error was 1.27. Table 7 describes the CSQ scores.

Table 7
Frequency and Percentage of
Client Satisfaction Questionnaire

<u>Score</u>	<u>f</u>	<u>%</u>
17-20	2	2.7
21-25	13	17.3
26-30	30	40.0
31-32	30	40.0
TOTAL	75	100.0

Tennessee Self-Concept Scale

The mean on the total positive score was 352.36 with a standard deviation of 28.43. The range was 131 with the low of 293 and the high of 424. The scores can range from 90 to 450. The standard error was 10.75. TSCS subscale frequencies and percentages are listed in Appendix G. The subscales means, standard deviations, ranges, variances, and standard errors are described in Appendix H. The subscale means fell within the published norms, \pm standard deviations, for the TSCS with the exception of the physical self subscale which was lower than the norm group (Fitts, 1965). Table 8 depicts the comparison of means between the norm group and study sample.

Table 8
 Comparison of Mean Scores of the Norm Group
 And The Study Sample

<u>Variables</u>	<u>Norm Group</u> N = 60	<u>Study Sample</u> N = 75
Self Criticism	35.54	29.01
Total Positive	345.57	352.36
Identity	127.10	125.95
Self Satisfaction	103.67	111.04
Behavior	115.01	115.32
Physical Self	71.78	63.20
Moral-Ethical Self	70.33	76.00
Personal Self	64.55	68.69
Family Self	70.83	73.92
Social Self	68.14	70.55
Variability	48.53	48.29
Distribution	120.44	122.28

Measure of Compliance

The dependent variable was the glycosylated hemoglobin (HbA_{1c}). Since Clinic 1 (Affinity method) standardized the HbA_{1c} values to the values at Clinic 2 (High Pressure Liquid Chromatography [HPLC] method), a linear transformation

allowed for the first clinic's scores to be comparable to the second clinic's scores. Appendix I lists original HbA_{1c}, Z-scores, and the result of the transformation.

The mean HbA_{1c} was 7.59% with a standard deviation of 1.36. The range was 6.28% with a low score of 5.33% and a high score of 11.61%. The reference range was 4.4%-6.1%.

Six of the subjects (8%) fell into the well controlled range. Appendix J describes the frequencies and percentages of the HbA_{1c} scores.

Findings

Two research questions were developed to investigate the effects of self-concept on compliance. The first research question was: What is the relationship between compliance with a health care regimen and self-concept in elderly diabetic clients? There was no relationship between compliance levels and self-concept. The results of the Pearson's product moment correlation coefficient (PPMCC) between compliance levels and the TSCS subscales are depicted in Table 9.

Table 9
Pearson Product Moment Correlation Coefficient
of Subscales of TSCS and HbA_{1c}

HbA _{1c}	<u>r</u>	<u>p</u> *
Self Criticism	0.03	.80
Total Positive	-0.02	.89
Identity	-0.06	.58
Self Satisfaction	0.003	.98
Behavior	0.02	.84
Physical Self	-0.08	.52
Moral-Ethical Self	0.04	.75
Personal Self	0.002	.99
Family Self	-0.02	.85
Social Self	0.01	.96

* p = < .05

The second research question was: After the influence of demographics, social support, health beliefs, and satisfaction with care have been taken into consideration, to what extent does self-concept explain degree of compliance with health care regimen in elderly diabetic

clients?

The variables religious preference and race were recoded. Religious preference was recoded to 1 = Protestant and 2 = Other since there was such a small number of non-protestants in the sample. Race was recoded to 1 = white 2 = other since there was a small frequency of non-white subjects. The data were examined for marked skewness and outliers. A Pearson Product Moment intercorrelation matrix among variables was run to test for multicollinearity among the variables. None was found. A hierarchical multiple regression was performed with the demographic and psychosocial variables entered first in a stepwise fashion. Then the Total Positive score was entered in a forward fashion.

Only two demographics entered the equation. Length of illness entered first accounting for 8% of the variance ($p = .02$). Complexity of health care regimen, number of injections, entered next accounting for 5% of the variance ($p = .007$). A total of 13% of the variance in HbA_{1c} was explained by these predictors. After accounting for shrinkage error, the adjusted R square was 10.7% of the explained variance (Table 10).

The PPMCC between length of illness and HbA_{1c} was $r_{xy} = .29$, $p = .007$, indicating the longer the diagnosis of diabetes the higher the HbA_{1c} . The PPMCC between complexity

of regimen and HbA_{1c} was $r_{xy} = .26$, $p = .01$, indicating the greater the number of insulin injections a day the higher the HbA_{1c}.

Table 10
Results of Hierarchical Multiple Regressions
Dependent Variable = HbA_{1c}
N = 71

Step	Variable	Mult. R	Rsq	F(Egn)	SigF
1	Length of Illness	.28	.08	6.06	.02
2.	Complexity of Health Care Regimen	.36	.13	5.18	.00
Adjusted R Squared 10.7%					

The subscales of the TCSC were entered using a forward method on an individual bases. None of the subscales entered the regression equation.

Summary of Findings

The sample consisted of 75 subjects who were evenly divided by gender with males representing 36 (48%) of the sample and females 39 (52%) of the sample. The mean age was 71.97 years and varied between 65 and 87.

The subjects reported a high satisfaction with care by their health care providers with 23 (30.7%) indicating the highest possible level of satisfaction. The mean self-concept score was 352.36 and the mean personal resource score was 139.69. The mean HbA_{1c}, reflecting compliance, was 7.59% with a reference range of 4.4%-6.1%.

The Pearson correlation coefficient did not support a relationship between TSCS scores and HbA_{1c}. The hierarchical multiple regression analysis revealed that length of illness and complexity of health care regimen explained 13% of the variance in HbA_{1c} levels.

CHAPTER 5

SUMMARY OF THE STUDY

The purpose of this study was to examine the effect of self-concept on compliance with a health care regimen in elderly diabetic clients. A summary of the study and a discussion of the findings are presented in this chapter. Conclusions, implications for nursing, and recommendations for further research are given.

Summary

A descriptive correlational design was used for this study. Questionnaires were mailed to 202 clients of two privately-owned diabetic clinics located in a large metropolitan city in the Southwestern United States. A total of 75 (37%) usable questionnaires was returned.

Descriptive statistics were used to summarize the data from the questionnaires. A Pearson's product moment correlation coefficient was used to analyze the relationship between compliance level and self-concept score.

Hierarchical multiple regression analysis was used to explain the variance of demographics, social support, health beliefs, satisfaction with care, and self-concept on compliance. No relationship between compliance levels and self-concept was found. Length of illness and complexity of

health care regimen accounted for 13% of the explained variance in HbA_{1c} levels.

Discussion of Findings

The theoretical framework for this study was the Neeley Interactive Self-Concept Model of Nursing. In this model, people are responsible for their own health behaviors. Individual perception of environmental stimuli affects self-concept. Self-concept in turn influences health care behaviors. Health is defined as the ability to function in a manner that is acceptable to the person and the group in which the person lives. The individual has the primary responsibility for maintenance of health.

Health and Compliance

Society expects individuals to follow established regimens of care if they have an illness or disease. Compliance with these health care regimens is supposed to decrease complications, increase quality and quantity of life, and save taxpayer money (Haynes, et. al., 1979; Ward, 1988). However, noncompliance with health care is a major problem in the United States with noncompliance among the elderly estimated at between 25% to 95% (Murray, et. al., 1986).

Demographic characteristics of an individual are frequently reported in the literature to affect compliance

behaviors (Martson, 1970). Age extremes, gender, low educational levels, low socioeconomic status, low levels of religious affiliation, increased length of illness, and complex health care regimens are reported to negatively impact compliance.

This study sample had a mean age of 72 years with a range of 65 to 87. The gender of the participants was almost evenly split with 36 subjects being male and 39 subjects being female. Sixty-four (85.3%) of the subjects were white. The mean education level was 13.2 years with a range of 5 to 20 years. The mode for reported income levels was \$22,000.00 although over half of the subjects did not indicate their income. Fifty-seven of the subjects reported that they were Protestant. Six participants indicated an "other" category, but none wrote in atheist. From these demographics, this population was at risk for noncompliance because of age. Sands and Holman (1985) found that compliance and age were inversely related. Tu et al. (1993) found that the elderly have greater difficulty adhering to a diabetic regimen because of physical impairments associated with old age. However, the subjects in the present study reported high socioeconomic and educational levels and religious affiliations. Since these clients were going to private endocrinologists who specialized in the treatment of diabetes, one could assume that they were a highly informed

and motivated group. In fact, only six of the subjects' HbA_{1c} levels were in the reference range.

Length of illness and complexity of health care regimen have been found to negatively impact compliance (Stewart & Caranasos, 1989). The mean number of years the subjects were aware of their diabetic condition was 13.44. Forty-six of the subjects reported insulin dependence. Twelve subjects reported 1 insulin injection a day, 28 reported taking two insulin injections a day, and six reported taking three insulin injections a day. Length of illness and complexity of health care regimen were the only two demographic variables that entered the multiple regression equation. Length of illness accounted for 8% of the variance and complexity of health care regimen accounted for an additional 5% of the variance. Pearson product moment correlation coefficients revealed correlations between the compliance measure of HbA_{1c} and length of illness and complexity. Length of diagnosis of diabetes correlated with HbA_{1c} levels at $r_{xy} = .29$, $p = .007$. Complexity of regimen correlated with HbA_{1c} at $r_{xy} = .26$, $p = .01$.

Internal Environment

Two internal environmental stimuli that affect health care behavior are self-concept and health beliefs (Fitts, 1972 and Becker & Janz, 1985). The individuals in this

study had self-concept scores that fell within the established norms for the general population (Fitts, 1965). Subscale scores of the TSCS also fell within the national norms with the exception of the physical self subscale which was low. Burns (1986) found similar results in a study evaluating NIDDM individuals' self-concept. Connell (1991) also found that older diabetics reported more chronic illness and lower levels of physical health than a nondiabetic comparison group. High levels of self-concept are hypothesized to increase compliance behaviors (Fitts, 1972). The average HbA_{1c} level was 7.59%. This level is consistent with fair control of diabetes. No relationship between self-concept and HbA_{1c} was found.

Other internal environmental stimuli that could affect compliance are health beliefs. Positive correlations between health beliefs and compliance to diabetic care regimens have been consistently reported in the literature (Becker et al., 1985; Redeker, 1988). The sample had an average MHBM score of 27. Scores could vary from 14 to 34. The sample did perceive that there were low barriers to performing self care activities related to their diabetes. They also expressed faith in the efficacy of their diabetic regimen in controlling their diabetes. The severity subscale of the HBM11 generated conflicting results. The sample did not see diabetes as potentially causing ill

effects on their future health status. According to the HBM, low perceived susceptibility scores are not congruent with compliance behaviors as the motivation to act is lacking (Becker, et. al., 1974). Harris, et. al. (1987) reported that the best predictor of control in diabetics was perceived seriousness of the disease process. However, these findings in elderly diabetics are supported by Connell (1991) who found that older individuals with NIDDM perceived less problems and less lifestyle impact from diabetes than comparison samples of younger diabetics. No relationship between health beliefs and compliance was found in this study. A possible reason that no relationship was found is that the elderly perceive that they have less lifestyle impact with diabetic care since many are often controlled by hypoglycemic agents and that long term effects of the disease are less likely to occur at their age (Connell,1991).

External Environment

External environmental factors that influence health behaviors are social support and satisfaction with care (Haynes & Sackett, 1974 and Hall and Dornan, 1988a, 1990). These two variables take into account the roles the individual takes on and the interaction the individual has with others. This interaction, in turn, influences the

individual's psychological environment.

Social support is viewed as a critical factor in promoting compliance (Haynes, et. al., 1976; Levy, 1986). Elderly clients are at risk for decreased social support because of confinement associated with chronic illness and loss of significant others (Ryan, et. al, 1989). Shenkel et al. (1985) reported that the strongest predictor of behavioral intentions was the importance of the behavior to the significant other. The sample's mean social support score was 140 out of 172 possible points. The group's mean score was above the mean scores reported by Weinert (1988). The group as a whole felt they had sufficient social support to assist and support them in their illness. Methodological concerns of what constitutes social support were accentuated when several participants wrote on their questionnaires comments such as "Friends and family are not the same thing. It's like mixing apples and oranges". No relationship between social support and compliance was found in this study.

Satisfaction with care is also an external environmental factor that influences compliance behaviors. Clients who perceived that their health care providers were supportive, good communicators, and technically competent were more likely to comply with health care advice (Hall et al., 1988, 1990). Diabetics are at risk for decreased

satisfaction with health care providers because they have a complex, life-style altering health care regimen to follow. Since the long term complications of noncompliance can be severe, even life threatening, health care providers tend to be more critical of diabetics who are noncompliers (Squier, 1990). The subjects in this study were very satisfied with the care they were receiving. The mean satisfaction score was 29 with a possible high score of 32. This high satisfaction rate may represent a sample bias as research has indicated that satisfied clients are more likely to respond to satisfaction questionnaires than non-satisfied clients (Attkinson, 1987). No relationship between satisfaction with care and compliance was found in this study.

Conclusions and Implications

Based on the findings of this study, the following conclusions were made:

1. No relationship between compliance with a health care regimen and self-concept in elderly diabetic clients was found.
2. Length of illness and complexity of a health care regimen influence compliance behaviors.

Implications were derived from the above conclusions. Since many elderly have both chronic illness and complex

treatment regimens, this group seems particularly susceptible to the problems of noncompliance. Nurses will need to assess for factors that could negatively influence compliance in elderly individuals. If clients are at risk for noncompliance, nurses could intervene with education and behavior modification programs designed to reinforce and validate positive compliance behaviors.

Self-concept was not found to influence compliance with this sample. However, of the two studies that examined the relationship between self-concept and health care compliance, one found a positive relationship and one no relationship (Andreoli, 1981; Burns, 1986). Attention to this area seems intuitively to warrant continued concern.

Recommendations for Further Study

The effects of self-concept on compliance in the elderly need to be further evaluated. Therefore, the following recommendations for further studies are presented:

1. The study should be replicated with clients from a variety of clinics and settings to provide some variability in the sample.
2. The study should be replicated using a larger sample size and other chronic disease processes to increase generalizability.
3. The study should be replicated using additional

instruments to measure compliance behaviors and complexity of health care regimen.

4. The study should be replicated using a qualitative method in addition to the quantitative method in order to gain more insight into reasons for compliance or noncompliance in the elderly.
5. The study should be replicated with collection of HbA_{1c} levels just prior to gathering data on psychosocial variables and again in two months to help control for life events that may influence compliance behaviors.

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APPENDIX A
AGENCY CONSENT

DIABETIC CENTER OF NORTHWEST HOUSTON

11302 Fallbrook, Suite 301
Houston, Texas 77065
(713) 890-4512

Dale J. Hamilton, M.D.
Medical Director

Sandra Hendricks, R.N., C.D.E.
Program Director

January 3, 1992

Mary Ann Neeley
1806 Branard
Houston, TX 77098

Dear Ms. Neeley:

This letter confirms our agreement to assist you in the conduct of your research.

To provide the data for your project and maintain patient confidentiality we propose the following -

You will provide us with:

1. 130 study instruments with a letter of introduction from you
2. 130 stamped window envelopes and 130 stamped self-addressed envelopes

We will:

1. Include a letter encouraging client participation and ask that they return the questionnaire in the enclosed envelope.
2. Write the most recent Hgb A1c and internal patient I.D. code on the instrument
3. Stuff the window envelopes with:
 - a. letter from clinic (enclosed for your comment)
 - b. letter from you
 - c. stamped envelopes addressed to you
 - d. instrument
4. Mail instruments

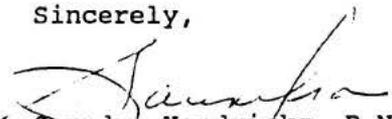
Page 2

In the event a second request for participation is necessary you will provide us with the I.D. codes of client responses received. We will do an additional mailing to those clients that have not responded.

I understand that a summary of the results will be provided to this clinic at the completion of the study.

We are looking forward to participation in this project.

Sincerely,



Sandra Hendricks, R.N., C.D.E.
Program Director

ERIC A. ORZECK, M.D., F.A.C.P.
PROFESSIONAL ASSOCIATION

*Diplomate, American Board of Internal Medicine
Internal Medicine and Endocrinology*

December 19, 1991

Mary Ann Neely
1806 Branard
Houston, Texas 77098

Dear Ms. Neeley:

This letter is to confirm our agreement to assist you in the
conduct of your research by providing the following:

1. A list of our clinic clients who meet the inclusion criteria
in your study
2. A list of the latest glycosylated hemoglobin for the clients
in the study

I understand that a summary of the results will be provided to
this clinic at the completion of the project.

Sincerely,



Eric A. Orzeck M.D.

APPENDIX B
HUMAN SUBJECTS APPROVAL FORMS

TEXAS WOMAN'S UNIVERSITY
DENTON DALLAS HOUSTON

HUMAN SUBJECTS REVIEW COMMITTEE - HOUSTON CENTER

PROSPECTUS FOR THE DISSERTATION
APPLICATION TO HUMAN SUBJECTS REVIEW COMMITTEE

(This form, completed and signed, must accompany student's dissertation research application to the HSRC)

This prospectus proposed by: Mary Ann Neeley

Social Security Number: 428-02-4484

Entitled: Effects of Self-Concept on Health Care Compliance in
Non-Institutionalized Diabetic Elderly

Has been read and approved by the members of his/her research committee.
This research (check one):

Is Exempt from Human Subjects Review Committee review because:
Survey Research

(If exempt is selected for this research, complete form "Exempt From HSRC Review")

Requires Full Human Subjects Review Committee review because:

Requires Expedited Human Subjects Review Committee review because:

Research Committee:

Type name
Dr. Carolyn Adamson (Chair)
Dr. Lynn Wieck
Dr. Anne Young

Signature
Carolyn Adamson
Lynn Wieck
Anne Young

Submit one copy to the Dean of the Graduate School)
HSRC Houston Center
Fall, 1991

The University of Texas
Health Science Center at Houston



The Committee for the
Protection of Human Subjects

JFB G.700
P.O. Box 20036
Houston, Texas 77225
(713) 792-5048
FAX (713) 794-4264

NOTICE OF APPROVAL TO BEGIN RESEARCH

January 15, 1992

HSC-SN-91-082 - "Effects of Self-Concept on Health Care Compliance in Non-Institutionalized Elderly"

P.I.: Mary Ann Neeley, RN, MSN

PROVISIONS: Unless otherwise noted, this approval relates to the research to be conducted under the above referenced title and/or to any associated materials considered at this meeting, e.g. study documents, informed consents, etc.

APPROVED: At a Convened Meeting

APPROVAL DATE: December 20, 1991

EXPIRATION DATE: December 31, 1992

CHAIRPERSON: Alan C. Swann, M.D.

Subject to any provisions noted above, you may now begin this research.

CHANGES - The P.I. must receive approval from the CPHS before initiating any changes, including those required by the sponsor, which would affect human subjects, e.g. changes in methods or procedures, numbers or kinds of human subjects, or revisions to the informed consent document or procedures. The addition of co-investigators must also receive approval from the CPHS. ALL PROTOCOL REVISIONS MUST BE SUBMITTED TO THE SPONSOR OF THE RESEARCH.

INFORMED CONSENT - Informed consent must be obtained by the P.I. or designee using the format and procedures approved by the CPHS. The P.I. must instruct the designee in the methods approved by the CPHS for the consent process. The individual obtaining informed consent must also sign the consent document.

UNANTICIPATED RISK OR HARM, OR ADVERSE DRUG REACTIONS - The P.I. will immediately inform the CPHS of any unanticipated problems involving risks to subjects or others, of any serious harm to subjects, and of any adverse drug reactions.

RECORDS - The P.I. will maintain adequate records, including signed consent documents if required, in a manner which ensures confidentiality.

The University of Texas
Health Science Center at Houston

The Committee for the
Protection of Human Subjects

JFB G.700
PO. Box 20036
Houston, Texas 77225
(713) 792-5048
FAX (713) 794-4264

NOTICE OF ANNUAL REVIEW APPROVAL

December 18, 1992

HSC-SN-91-082 - "Effects of Self-Concept on Health Care Compliance in Non-Institutionalized Elderly"

P.I.: Mary Ann Neeley, R.N., M.S.N. student

APPROVED: At a Convened Meeting

APPROVAL DATE: December 18, 1992 EXPIRATION DATE: December 31, 1993

CHAIRPERSON: Alan C. Swann, M.D.

Upon review, the CPHS finds that this research is being conducted in accord with its guidelines and with the methods agreed upon by the P.I. and approved by the Committee. This approval, subject to any listed provisions and contingent upon compliance with the following stipulations, will expire as noted above:

CHANGES - The P.I. must receive approval from the CPHS before initiating any changes, including those required by the sponsor, which would affect human subjects, e.g/ changes in methods or procedures, numbers or kinds of human subjects, or revisions to the informed consent document or procedures. The addition of co-investigators must also receive approval from the CPHS.

INFORMED CONSENT - Informed consent must be obtained by the P.I. or designee using the format and procedures approved by the CPHS. The P.I. must instruct the designee in the methods approved by the CPHS for the consent process. The individual obtaining informed consent must also sign the consent document.

UNANTICIPATED RISK OR HARM, OR ADVERSE DRUG REACTIONS - The P.I. will immediately inform the CPHS of any unanticipated problems involving risks to subjects or others, of any serious harm to subjects, and of any adverse drug reactions.

RECORDS - The P.I. will maintain adequate records, including signed consent documents if required, in a manner which ensures confidentiality.

APPENDIX C
LETTER OF CONSENT

Dear Participant:

As a doctoral student in the College of Nursing at Texas Woman's University, I am conducting a study to examine the effects of various concepts on health behaviors. You are being asked to please complete the attached questionnaire which will probably take you about 30 minutes.

Participation in this study is completely voluntary and your name will not appear on any of the forms. Data will be reported in summary form only. You will note that the questionnaires are coded. The code was assigned by me to follow up with non-respondents and to obtain previously drawn glycosylated hemoglobin levels from your physician. Since the code list will be in my possession, confidentiality will be maintained. There are no perceived risks in completing the questionnaire except for the possible feeling of discomfort that occurs with self-examination. While there are no direct benefits, participation in this study can provide personal satisfaction as well as contributing to health care research that can improve patient care. Participation is voluntary and you may withdraw from the study at any time without affecting your care.

Please complete the questionnaire, place it in the self-addressed stamped envelope provided, and return by mail. Please return the questionnaire within two weeks to assure being included in the study.

If you have any questions concerning the questionnaire or completion procedures, I can be reached at 792-7859. Written inquiries are also welcome.

**YOUR COMPLETION AND RETURN OF THIS QUESTIONNAIRE
INDICATES WILLINGNESS TO PARTICIPATE IN THE STUDY.**

Thank you for your time and interest.

Sincerely,

Mary Ann Neeley, RN, MSN
Doctoral Student
Texas Woman's University

APPENDIX D
PERMISSION TO REPRODUCE INSTRUMENTS

Oct. 4, 1991

1806 Branard
Houston, Texas 77098

Dr. Ann Hurley
61 Babcock Street, Apt. 3-A
Brookline, MA 02146

Dear Dr. Hurley:

I read your article on "The Health Belief Model: Evaluation of a Diabetes Scale" in the Diabetes Educator. I would like to use your HBM-11 in my dissertation research. My sample will include both IDDM and NIDDM clients. Would it be possible to change the word "insulin" to "diabetes medication" in order to make the tool specific for my subjects.

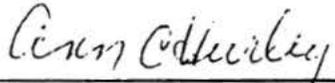
I will need a copy of the tool as I have only seen it in your article. If there are any fees involved please let me know. My work phone number is 713/792-7859.

For your convenience I have included a permission form, a duplicate copy of the form for your files, and a self addressed, stamped envelope.

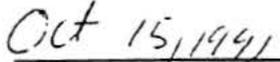
Sincerely,


Mary Ann Neeley
Doctoral Student
Texas Woman's University

Permission is granted for use of the material as stipulated.



Signature



Date

Oct. 4, 1991

1806 Branard
Houston, Texas 77098

Dr. C. Clifford Attkisson
Department of Psychiatry
Box 33-C
San Francisco, CA 94143

Dear Dr. Attkisson:

I am a doctoral student at Texas Woman's University. I am interested in using your client satisfaction questionnaire in my dissertation research. I have reviewed the instrument in Corcoran and Fischer's, Measures for Clinical Practice, 1987.

I would like to change the word "program" to "service" in items 3, 4, and 8. I do not feel that this would be a substantive change but, please advise if this would be a problem. *(I advise against making such changes. I will want to use our Norms.)*
If there is a new form of the questionnaire, since 1985, a fee involved, or any other regulations regarding its use please let me know. My work phone is 713/792-7859.

For your convenience I have included a permission form, a duplicate copy of the form for your files, and a self addresses, stamped envelope.

Sincerely,

Mary Ann Neeley
Mary Ann Neeley
Doctoral Student
Texas Woman's University

Permission is granted for use of the material as stipulated.

C. Clifford Attkisson, Ph.D.
Signature

10/14/91
Date

Oct. 4, 1991

1806 Branard
Houston Texas, 77098

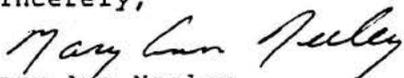
Dr. Clarann Weinert
College of Nursing
Montana State University
Bozeman, MT 59717

Dear Dr. Weinert:

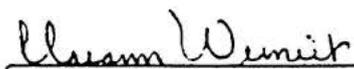
I am a doctoral student at Texas Woman's University and am interested in using the Personal Resource Questionnaire, Part II in my dissertation research. I am writing you for permission to do so. If there are any fees, etc. involved please let me know.

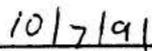
For your convenience I have enclosed a permission form, a duplicate copy of the form for your files, and a self addressed, stamped envelope.

Sincerely,


Mary Ann Neeley
Doctoral Student
Texas Woman's University
713/792-7859

Permission is granted for use of the material as stipulated.


Signature


Date

WPS WESTERN PSYCHOLOGICAL SERVICES
Publishers and Distributors Since 1948

January 3, 1992

Mary Ann Neeley
1806 Branard
Houston, Texas 77098

Dear Ms. Neeley:

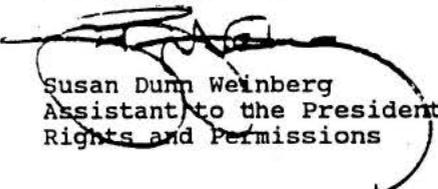
We have processed your license fee for the adaptation and reproduction of WPS materials. Enclosed is WPS Invoice #425453, serving as your license to adapt the Tennessee Self-Concept Scale (TSCS), and to reproduce up to 110 copies of the adaptation, subject to the terms outlined in my letter to you of November 7, 1991.

With reference to my November 7 letter, the following is the copyright notice that must appear in its entirety on each reprint:

"Copyright © 1964 by William H. Fitts. Adapted and reprinted by permission of the publisher, Western Psychological Services, 12031 Wilshire Boulevard, Los Angeles, California 90025, U.S.A."

Your interest in the TSCS is appreciated, and we look forward to hearing the results of your research. Please do not hesitate to contact me if I may be of additional assistance.

Sincerely yours,



Susan Dunn Weinberg
Assistant to the President
Rights and Permissions

SDW:se
Enclosure

APPENDIX E
INSTRUMENTS

Demographic Information

Please answer the following questions by placing a check in the appropriate space or writing in the answer as indicated.

1. Age: _____
2. Sex: Male Female
3. Race:
 - White
 - Black
 - Hispanic
 - Other _____ (Please write in)
4. Marital Status:
 - Married
 - Widowed
 - Divorced
 - Other _____ (Please write in)
5. Household Status:
 - Live with Spouse
 - Live with spouse and children
 - Live with children
 - Live with relative(s)
 - Live alone
 - Other _____ (Please write in)
6. Religious Affiliation:
 - Protestant
 - Catholic
 - Jewish
 - Other _____ (Please write in)
7. Please write in the numbers of years of formal education you have had. _____
8. Employment:
 - Retired
 - Employed, part-time
 - Employed, full-time
 - Other _____ (Please write in)
9. Annual Income: \$ _____
10. How many years ago were first told that you had diabetes? _____
11. Are you on insulin?
 - Yes No
 If so, how many injections do you take a day?

12. Do you inject yourself with a blood thinner called Heparin?
 - Yes No

Client Satisfaction Questionnaire

Please help us improve our program by circling the response that indicates how you feel about our services. We are interested in your honest opinion, whether they are positive or negative.

PLEASE ANSWER ALL THE QUESTIONS.

1. How would you rate the quality of service you have received?
 4 - Excellent 3 - Good 2 - Fair 1 - Poor
2. Did you get the kind of service you wanted?
 - 1 No, definitely
 - 2 No, not really
 - 3 Yes, generally
 - 4 Yes, definitely
3. To what extent has our program met your needs?
 - 4 Almost all of my needs have been met
 - 3 Most of my needs have been met
 - 2 Only a few of my needs have been met
 - 1 None of my needs have been met
4. If a friend were in need of similar help, would you recommend our program to him or her?
 - 1 No definitely not
 - 2 No, I don't think so
 - 3 Yes, I think so
 - 4 Yes, definitely
5. How satisfied are you with the amount of help you have received?
 - 1 Quite dissatisfied
 - 2 Indifferent or mildly dissatisfied
 - 3 Mostly satisfied
 - 4 Very satisfied
6. Have the services you received helped you to deal more effectively with your diabetes?
 - 4 Yes, they helped a great deal
 - 3 Yes, they helped somewhat
 - 2 No, they really didn't help
 - 1 No, they seemed to make things worse
7. In an overall, general sense, how satisfied are you with the service you have received?
 - 4 Very satisfied
 - 3 Mostly satisfied
 - 2 Indifferent or mildly dissatisfied
 - 1 Quite dissatisfied
8. If you were to seek help again, would you come back to our program?
 - 1 No, definitely not
 - 2 No, I don't think so
 - 3 Yes, I think so
 - 4 Yes, definitely

Tennessee Self Concept Scale

The statements on this form are to help you describe yourself as you see yourself. Please respond to them as if you were describing yourself to yourself. Do not omit any item! Read each statement carefully; then circle one of the five responses you have chosen for each statement.

Responses:	5	4	3	2	1
	Completely True				
	Mostly True				
	Partly False and Partly True				
	Mostly False				
	Completely False				
1. I have a healthy body.	5	4	3	2	1
2. I am an attractive person.	5	4	3	2	1
3. I consider myself a sloppy person.	5	4	3	2	1
4. I am a decent sort of person.	5	4	3	2	1
5. I am an honest person.	5	4	3	2	1
6. I am a bad person.	5	4	3	2	1
7. I am a cheerful person.	5	4	3	2	1
8. I am a calm and easy going person.	5	4	3	2	1
9. I am a nobody.	5	4	3	2	1
10. I have a family that would always help me in any kind of trouble.	5	4	3	2	1
11. I am a member of a happy family.	5	4	3	2	1
12. My friends have no confidence in me.	5	4	3	2	1
13. I am a friendly person.	5	4	3	2	1
14. I am popular with men.	5	4	3	2	1
15. I am not interested in what other people do.	5	4	3	2	1
16. I do not always tell the truth.	5	4	3	2	1
17. I get angry sometimes.	5	4	3	2	1
18. I like to look nice and neat all the time.	5	4	3	2	1
19. I am full of aches and pains.	5	4	3	2	1
20. I am a sick person.	5	4	3	2	1
21. I am a religious person.	5	4	3	2	1
22. I am a moral failure.	5	4	3	2	1
23. I am a morally weak person.	5	4	3	2	1
24. I have a lot of self-control.	5	4	3	2	1
25. I am a hateful person.	5	4	3	2	1
26. I am losing my mind.	5	4	3	2	1
27. I am an important person to my friends and family.	5	4	3	2	1
28. I am not loved by my family.	5	4	3	2	1

29. I feel that my family doesn't trust me.	5	4	3	2	1
30. I am popular with women.	5	4	3	2	1
31. I am mad at the whole world.	5	4	3	2	1
32. I am hard to be friendly with.	5	4	3	2	1
33. Once in a while I think of things too bad to talk about.	5	4	3	2	1
34. Sometimes, when I am not feeling well, I am cross.	5	4	3	2	1
35. I am neither too fat nor thin.	5	4	3	2	1
36. I like my looks just the way they are.	5	4	3	2	1
37. I would like to change some parts of my body.	5	4	3	2	1
38. I am satisfied with my moral behavior.	5	4	3	2	1
39. I am satisfied with my relationship to God.	5	4	3	2	1
40. I ought to go to church more.	5	4	3	2	1
41. I am satisfied to be just what I am.	5	4	3	2	1
42. I am just as nice as should be.	5	4	3	2	1
43. I despise myself.	5	4	3	2	1
44. I am satisfied with my family relationships.	5	4	3	2	1
45. I understand my family as well as I should.	5	4	3	2	1
46. I should trust my family more.	5	4	3	2	1
47. I am as sociable as I want to be.	5	4	3	2	1
48. I try to please others, but I don't overdo it.	5	4	3	2	1
49. I am no good at all from a social standpoint.	5	4	3	2	1
50. I do not like everyone I know.	5	4	3	2	1
51. Once in a while, I laugh at a dirty joke.	5	4	3	2	1
52. I am neither too tall nor too short.	5	4	3	2	1
53. I don't feel as well as I should.	5	4	3	2	1
54. I should have more sex appeal.	5	4	3	2	1
55. I am as religious as I want to be.	5	4	3	2	1
56. I wish I could be more trustworthy.	5	4	3	2	1
57. I shouldn't tell so many lies.	5	4	3	2	1
58. I am as smart as I want to be.	5	4	3	2	1
59. I am not the person I would like to be.	5	4	3	2	1

60. I wish I didn't give up as easily as I do. 5 4 3 2 1
61. I treat my parents as well as I should. (use past tense if parents are not living). 5 4 3 2 1
62. I am too sensitive to things my family say. 5 4 3 2 1
63. I should love my family more. 5 4 3 2 1
64. I am satisfied with the way I treat other people. 5 4 3 2 1
65. I should be more polite to others. 5 4 3 2 1
66. I ought to get along better with other people. 5 4 3 2 1
67. I gossip a little at times. 5 4 3 2 1
68. At times, I feel like swearing. 5 4 3 2 1
69. I take good care of myself physically. 5 4 3 2 1
70. I try to be careful about my appearance. 5 4 3 2 1
71. I often act like I am "all thumbs". 5 4 3 2 1
72. I am true to my religion in my everyday life. 5 4 3 2 1
73. I try to change when I know I'm doing things that are wrong. 5 4 3 2 1
74. I sometimes do very bad things. 5 4 3 2 1
75. I can always take care of myself in any situation. 5 4 3 2 1
76. I take the blame for things without getting mad. 5 4 3 2 1
77. I do things without thinking about them first. 5 4 3 2 1
78. I try to play fair with my friends and family. 5 4 3 2 1
79. I take a real interest in my family. 5 4 3 2 1
80. I give in to my parents. (Use past tense if parents are not living). 5 4 3 2 1
81. I try to understand the other fellow's point of view. 5 4 3 2 1
82. I get along well with other people. 5 4 3 2 1
83. I do not forgive others easily. 5 4 3 2 1
84. I would rather win than lose in a game. 5 4 3 2 1
85. I feel good most of the time. 5 4 3 2 1
86. I do poorly in sports and games. 5 4 3 2 1

87. I am a poor sleeper. 5 4 3 2 1
88. I do what is right most of the time. 5 4 3 2 1
89. I sometimes use unfair means to get ahead. 5 4 3 2 1
90. I have trouble doing the things that are right. 5 4 3 2 1
91. I solve my problems quite easily. 5 4 3 2 1
92. I change my mind a lot. 5 4 3 2 1
93. I try to run away from my problems. 5 4 3 2 1
94. I do my share of work at home. 5 4 3 2 1
95. I quarrel with my family. 5 4 3 2 1
96. I do not act like my family thinks I should. 5 4 3 2 1
97. I see good points in all the people I meet. 5 4 3 2 1
98. I do not feel at ease with other people. 5 4 3 2 1
99. I find it hard to talk with strangers. 5 4 3 2 1
100. Once in a while I put off until tomorrow what I ought to do today. 5 4 3 2 1

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Health Belief Model

Ann Hurley

The following statements describe what some people believe about diabetes and its treatment. After reading each statement, circle the number that best expresses your beliefs. There are eleven statements (11).

THERE ARE NO RIGHT OR WRONG ANSWERS.

Responses: 5 Strongly Agree
4 Agree
3 Undecided
2 Disagree
1 Strongly Disagree

1. I believe that my diet and medication will prevent diseases related to diabetes. 5 4 3 2 1
2. My diabetes is no problem to me as long as I feel all right. 5 4 3 2 1
3. My diabetes will have a bad effect on my future health. 5 4 3 2 1
4. My diabetes will cause me to be sick a lot. 5 4 3 2 1

5. I believe I will always need my diabetic diet and medication. 5 4 3 2 1
6. I believe I can control my diabetes. 5 4 3 2 1
7. I believe that my diet and medication will control my diabetes. 5 4 3 2 1
8. I would have to change too many habits to follow my diet. 5 4 3 2 1
9. It has been difficult following the diet prescribed for me. 5 4 3 2 1
10. I cannot understand everything I've been told about my diet. 5 4 3 2 1
11. Taking my diabetes medication interferes with my normal daily activities. 5 4 3 2 1

Personal Resource Questionnaire - Part II

Patricia Brandt & Clarann Weinert

Below are some statements with which some people agree and others disagree. Please read each statement and circle the response most appropriate for you.

THERE IS NO RIGHT OR WRONG ANSWER.

- Responses: 7 Strongly Agree
6 Agree
5 Somewhat Agree
4 Neutral
3 Somewhat Disagree
2 Disagree
1 Strongly Disagree

1. There is someone I feel close to who makes me feel secure. 7 6 5 4 3 2 1
2. I belong to a group in which I feel important. 7 6 5 4 3 2 1
3. People let me know that I do well at my work (job, homemaking). 7 6 5 4 3 2 1
4. I can't count on my relatives and friends to help me with problems. 7 6 5 4 3 2 1
5. I have enough contact with the person who makes me feel special. 7 6 5 4 3 2 1
6. I spend time with others who have the same interests that I do. 7 6 5 4 3 2 1
7. There is little opportunity in my life to be giving and caring to another person. 7 6 5 4 3 2 1
8. Others let me know that they enjoy working with me (job, committees, projects). 7 6 5 4 3 2 1
9. There are people who are available if I needed help over an extended period of time. 7 6 5 4 3 2 1
10. There is no one to talk to about how I am feeling. 7 6 5 4 3 2 1
11. Among my group of friends, we do favors for each other. 7 6 5 4 3 2 1
12. I have the opportunity to encourage others to develop their interests and skills. 7 6 5 4 3 2 1
13. My family lets me know that I am important for keeping the family running. 7 6 5 4 3 2 1
14. I have relatives or friends who will help me out even if I can't pay them back. 7 6 5 4 3 2 1
15. When I am upset, there is someone I can be with who lets me be myself. 7 6 5 4 3 2 1
16. I feel no one has the same problems as I. 7 6 5 4 3 2 1
17. I enjoy doing little "extra" things that make another person's life more pleasant. 7 6 5 4 3 2 1
18. I know that others appreciate me as a person. 7 6 5 4 3 2 1
19. There is someone who loves and cares about me. 7 6 5 4 3 2 1
20. I have people to share social events and fun activities with. 7 6 5 4 3 2 1
21. I am responsible for helping provide for another person's needs. 7 6 5 4 3 2 1
22. If I need advice there is someone who would assist me to work out a plan for dealing with the situation. 7 6 5 4 3 2 1
23. I have a sense of being needed by another person. 7 6 5 4 3 2 1
24. People think that I'm not as good a friend as I should be. 7 6 5 4 3 2 1
25. If I got sick there is someone to give me advice about caring for myself. 7 6 5 4 3 2 1

APPENDIX F

LETTER TO PARTICIPANTS FROM CLINICAL AGENCIES

Northwest Houston Diabetes Center

Dale J. Hamilton, M.D., 11302 Fallbrook, Suite 301, Houston, Texas 77065
(713) 890-4512

January 7, 1992

ELSIE

Dear Ms.

The Diabetes Center has been selected to participate in a research project conducted by graduate student, Mary Ann Neeley, R.N., M.S.N.

We have been asked to provide a patient population of individuals over 65 years of age and their most recent Hgb Alc.

As a member of this group we are requesting that you complete the enclosed questionnaire and return it at your earliest convenience in the enclosed stamped envelope. You will note a series of numbers hand written on the first page of the questionnaire. These represent an internal I.D. code and your most recent Hgb Alc.

This information is blinded to maintain the participants anonymity.

We encourage you to spend a few minutes to complete the enclosed questionnaire. You may find the exercise interesting and your input may improve health care delivery.

Please answer these questions accurately as possible, be assured your anonymity is protected.

Thank you for your participation.

Sincerely,

Sandra Hendricks, R.N., C.D.E.
Program Director

ERIC A. ORZECK, M.D., F.A.C.P.

117

Professional Association
DIPLOMATE AMERICAN BOARD OF INTERNAL MEDICINE
INTERNAL MEDICINE AND ENDOCRINOLOGY

January 30 ,1992

Dear :

Our office has been selected to participate in a research project conducted by Mary Ann Neeley, R.N., M.S.N. The study will examine the effects of various concepts on health behaviors and has been approved by the Human Subjects Committees of Texas Woman's University and the University of Texas Health Science Center at Houston.

I am requesting that you complete the enclosed questionnaire and return it at your earliest convenience in the enclosed stamped envelope. You will note a series of numbers hand written on the first page of the questionnaire. These represent an internal I.D. code which is used to maintain participants confidentiality.

We encourage you to spend a few minutes to complete the enclosed questionnaire. You may find the exercise interesting and your input may improve health care delivery.

Please answer these question as accurately as possible. Thank you for your participation.

Sincerely,



Eric A. Orzeck M.D.

APPENDIX G
FREQUENCY AND PERCENTAGES OF THE
TENNESSEE SELF-CONCEPT SUBSCALES

Frequency and Percentages of the
Tennessee Self-Concept Subscales

<u>Score</u>	<u>f</u>	<u>%</u>
Self Criticism		
16-19	2	2.7
20-29	43	57.3
30-39	29	38.7
41	1	1.3
TOTAL	<u>75</u>	<u>100.0</u>
Total Positive		
293-299	3	4.0
300-319	6	8.0
320-339	17	22.7
340-359	20	26.6
360-379	15	20.0
380-399	10	13.4
400-419	3	4.0
420-429	1	1.3
TOTAL	<u>75</u>	<u>100.0</u>
Identity		
100-109	7	9.3
110-119	8	10.7
120-129	30	40.0
130-139	25	33.3
140-146	5	6.7
TOTAL	<u>75</u>	<u>100.0</u>

Frequency and Percentages of the
Tennessee Self-Concept Subscales

<u>Score</u>	<u>f</u>	<u>%</u>
Self-Satisfaction		
84-89	3	4.0
90-99	9	12.0
100-109	23	30.7
110-119	20	26.6
120-129	15	20.0
130-139	4	5.4
141	1	1.3
TOTAL	<u>75</u>	<u>100.0</u>
Behavior		
92-99	4	5.3
100-109	20	26.7
110-119	25	33.3
120-129	17	22.7
130-139	8	10.7
141	1	1.3
TOTAL	<u>75</u>	<u>100.0</u>
Physical Self		
43-49	4	5.3
50-59	23	30.7
60-69	30	40.0
70-79	15	20.0
80-86	3	4.0
TOTAL	<u>75</u>	<u>100.0</u>
Moral-Ethical Self		
60-69	15	20.0
70-79	34	45.3
80-89	25	33.4
90	1	1.3
TOTAL	<u>75</u>	<u>100.0</u>

Frequency and Percentages of the
Tennessee Self-Concept Subscales

<u>Score</u>	<u>f</u>	<u>%</u>
Personal Self		
49-59	9	12.0
60-69	33	44.0
70-79	30	40.0
80-87	3	4.0
TOTAL	<u>75</u>	<u>100.0</u>
Family Self		
59	1	1.3
60-69	21	28.0
70-79	37	49.4
80-89	16	21.3
TOTAL	<u>75</u>	<u>100.0</u>
Social Self		
54-59	5	6.7
60-69	30	40.0
70-79	33	44.0
80-87	7	9.3
TOTAL	<u>75</u>	<u>100.0</u>
Variability		
17	1	1.3
20-29	4	5.4
30-39	12	16.0
40-49	23	30.6
50-59	22	29.4
60-69	8	10.6
70-76	5	6.7
TOTAL	<u>75</u>	<u>100.0</u>

Frequency and Percentages of the
Tennessee Self-Concept Subscales

<u>Score</u>	<u>f</u>	<u>%</u>
Distribution		
64-79	3	4.0
80-89	7	9.4
90-99	7	9.4
100-109	10	13.3
110-119	9	12.0
120-129	11	14.6
130-139	8	10.6
140-149	6	8.0
150-159	6	8.0
160-169	3	4.0
170-179	3	4.0
180-189	2	2.7
TOTAL	<u>75</u>	<u>100.0</u>

APPENDIX H
DESCRIPTIVE STATISTICS OF THE
TENNESSEE SELF-CONCEPT SUBSCALES

Means, Standard Deviations, Ranges, Variances,
And Standard Errors of the TSCS Subscales

	<u>X</u>	<u>S.D.</u>	<u>R</u>	<u>S²</u>	<u>SF_m</u>
Self Criticism	29.01	5.275	25.00	27.82	3.22
Total Positive	352.36	28.43	131.00	808.42	10.75
Identify	125.95	10.17	46.00	103.46	6.27
Self Satisfaction	111.04	12.46	57.00	155.34	6.42
Behavior	115.32	10.37	49.00	107.52	5.67
Physical Self	63.20	8.78	43.00	77.03	4.51
Moral-Ethical Self	76.00	7.46	30.00	55.62	4.94
Personal Self	68.69	7.08	38.00	50.11	4.88
Family Self	73.92	6.81	30.00	46.32	4.70
Social Self	70.55	7.02	33.00	49.22	4.54
Total Self	48.29	12.36	59.00	152.67	7.24
Distri- bution	122.28	28.71	122.00	824.48	32.40

APPENDIX I

ORIGINAL HbA_{1c} AND TRANSFORMED HbA_{1c} OF SUBJECTS

Original HbA_{1c} and Transformed HbA_{1c} of Subjects

<u>Clinic</u>	<u>Original A1C</u>	<u>Z-Score</u>	<u>Transformed HbA_{1c}</u>
1	4.8	-1.08709	6.10
1	5.2	-.83900	6.44
1	6.3	-.15677	7.37
1	4.7	-1.14911	6.01
1	5.7	-.52890	6.86
1	8.2	1.02162	8.98
1	8.4	1.14566	9.15
1	5.2	-.83900	6.44
1	6.0	-.34284	7.12
1	8.9	1.45577	9.58
1	8.6	1.26971	9.32
1	5.5	-.65294	6.69
1	8.5	1.20768	9.24
1	6.2	-.21880	7.29
1	6.9	.21535	7.88
1	10.3	2.32406	10.77
1	6.7	.09131	7.71
1	4.7	-1.14911	6.01
1	5.9	-.40486	7.03
1	5.9	-.40486	7.03
1	5.7	-.52890	6.86
1	6.9	.21535	7.88
1	11.3	2.94427	11.61
1	6.1	-.28082	7.20
1	5.6	-.59092	6.78
1	5.6	-.59092	6.78
1	8.5	1.20768	9.24
1	5.1	-.90103	6.35
1	6.0	-.34284	7.12
1	6.1	-.28082	7.20
1	6.0	-.34284	7.12
1	7.3	.46343	8.22
1	7.0	.27737	7.96
1	5.9	-.40486	7.03
1	3.9	-1.64528	5.33
1	6.3	-.15677	7.37
2	10.8	-.15677	10.80
2	7.0	-.15677	7.00
2	10.8	-.15677	10.80
2	6.9	-.15677	6.90
2	9.0	-.15677	9.00
2	8.0	-.15677	8.00
2	6.5	-.15677	6.50
2	9.3	-.15677	9.30
2	8.0	-.15677	8.00
2	7.0	-.15677	7.00
2	8.1	-.15677	8.10
2	7.3	-.15677	7.30
2	7.0	-.15677	7.00

2	8.0	- .15677	8.00
2	7.6	- .15677	7.60
2	6.8	- .15677	6.80
2	10.0	- .15677	10.00
2	7.4	- .15677	7.40
2	6.4	- .15677	6.40
2	8.2	- .15677	8.20
2	7.7	- .15677	7.70
2	8.2	- .15677	8.20
2	5.9	- .15677	5.90
2	6.4	- .15677	6.40
2	11.6	- .15677	11.60
2	7.0	- .15677	7.00
2	7.7	- .15677	7.70
2	7.2	- .15677	7.20
2	6.0	- .15677	6.00
2	6.0	- .15677	6.00
2	7.7	- .15677	7.70
2	6.9	- .15677	6.90
2	6.4	- .15677	6.40
2	6.2	- .15677	6.20
2	6.4	- .15677	6.40
2	7.2	- .15677	7.20
2	6.5	- .15677	6.50
2	8.0	- .15677	8.00
2	6.7	- .15677	6.70

APPENDIX J
FREQUENCY AND PERCENTAGES OF HbA_{1c} OF SUBJECT

Frequency and Percentages of HbA_{1c} of Subject

<u>HbA_{1c}</u>	<u>f</u>	<u>%</u>
5.33	1	1.3
5.90	1	1.3
6.00	2	2.7
6.01	2	2.7
6.10	1	1.3
6.20	1	1.3
6.35	1	1.3
6.40	4	5.3
6.44	2	2.7
6.50	2	2.7
6.69	1	1.3
6.70	1	1.3
6.78	2	2.7
6.80	1	1.3
6.86	2	2.7
6.90	2	2.7
7.00	4	5.3
7.03	3	4.0
7.12	3	4.0
7.20	2	2.7
7.20	2	2.7
7.29	1	1.3
7.30	1	1.3
7.37	2	2.7
7.40	1	1.3
7.60	1	1.3
7.70	3	4.0
7.71	1	1.3
7.88	2	2.7
7.96	1	1.3
8.00	4	5.3
8.10	1	1.3
8.20	2	2.7
8.22	1	1.3
8.98	1	1.3
9.00	1	1.3
9.15	1	1.3
9.24	2	2.7
9.30	1	1.3
9.32	1	1.3
9.58	1	1.3
10.00	1	1.3
10.77	1	1.3
10.80	2	2.7
11.60	1	1.3
11.61	1	1.3
TOTAL	75	100.0