IMPACT OF SOCIAL SUPPORT, SELF-EFFICACY, AND OUTCOME EXPECTATIONS ON SELF-CARE BEHAVIORS AND GLYCEMIC CONTROL IN CAUCASIAN AND AFRICAN-AMERICAN ADULTS WITH TYPE 2 DIABETES MELLITUS

DISSERTATION

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By

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ABSTRACT

Caucasians and African-Americans with type 2 diabetes continue to experience preventable diabetes-related life-threatening complications despite medical advances and health care availability. African-Americans are more likely to suffer from diabetes-related complications and experience a higher diabetes-related mortality rate than Caucasians. There is a definite need to better understand the relationship of psychosocial variables to diabetes control in these two racial groups. The purpose of this two-group, comparative, descriptive study was to examine the relationships of social support, self-efficacy, and outcome expectations (beliefs that diabetes-related behaviors will lead to certain outcomes) to self-care behaviors and glycemic control in Caucasian and African-American adults with type 2 diabetes. A convenience sample of 91 Caucasian and African-American subjects receiving health care at three outpatient facilities participated in the study. All subjects completed four self-report measures: Social Support Questionnaire, Self-Efficacy Questionnaire, Outcome Expectancy Questionnaire, and the Diabetes Activities Questionnaire at the time of the outpatient visit. Long-term glycemic control was assessed by glycosylated hemoglobin analyses at the time of the outpatient visit. Two-sample t-tests revealed no significant differences between the two racial groups in regards to age ($p = .81$), duration of diabetes ($p = .69$), and glycosylated hemoglobin ($p = .85$). Chi-square analyses revealed two significant differences between
the two racial groups with regard to sex ($p = .04$) and marital status ($p < .0001$). Seventy-four percent of the African-American sample was female while only 48.4\% of Caucasians were female. Thirty-two percent of the African-American sample was married contrasting to 70.3\% of Caucasians who were married. No significant differences were found with regard to education ($p = .37$), occupation ($p = .20$), and medication management ($p = .57$). Pearson product-moment correlations were used to determine whether significant relationships exist between scores on the self-report measures and self-care behaviors and glycosylated hemoglobin values. Analyses revealed no significant relationships between social support and self-care behaviors. No significant relationships were found between self-efficacy and self-care behaviors. Self-care behaviors were significantly, positively correlated with outcome expectancy scores for the total group ($r = .27$, $\rho = .01$) and for African-Americans ($r = .43$, $p = .03$). No significant relationships were found between: (1) social support and glycemic control; (2) self-efficacy and glycemic control; and (3) outcome expectations and glycemic control. Two sample t-tests revealed one significant difference between the racial groups with regard to social support satisfaction ($p = .05$). African-Americans reported less social support satisfaction than Caucasians. The results of this study suggest the need for further investigation of other variables that may impact diabetes control in Caucasians and African-Americans with type 2 diabetes.
DEDICATION

For Bill, and my children, Corrin, Rachael, Justin, Jordan, and Connor

My family who supported me through doctoral study
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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>ii</td>
</tr>
<tr>
<td>Dedication</td>
<td>iv</td>
</tr>
<tr>
<td>Acknowledgments</td>
<td>v</td>
</tr>
<tr>
<td>Vita</td>
<td>vi</td>
</tr>
<tr>
<td>List of Tables</td>
<td>xii</td>
</tr>
</tbody>
</table>

## Chapters:

1. Introduction ........................................ 1
   - Purpose ........................................... 2
   - Hypotheses ........................................ 3

2. Theoretical background ............................ 5
   - The concept of social support .................. 5
   - The concept of self-efficacy .................... 7

3. Literature review ................................. 10
   - The chronic condition of diabetes mellitus ... 10
   - Social support and self-care behaviors ......... 14
   - Social support and glycemic control .......... 18
   - Self-efficacy and health-related behaviors ... 26
   - Self-efficacy and diabetes self-care behaviors 27
   - Health disparities between the races .......... 32
   - Health beliefs of Caucasians and African-Americans ... 34
   - Summary .......................................... 38
4. Research methods ................................................................. 40
   Study design ................................................................. 40
   Sample ........................................................................... 41
   Procedures ...................................................................... 41
   Description of sites ......................................................... 44
   Instrumentation ............................................................... 45
      Social Support Questionnaire ...................................... 45
      Self-Efficacy Questionnaire ........................................ 46
      Outcome Expectancy Questionnaire ............................. 48
      The Diabetes Activities Questionnaire ...................... 50
      Glycosylated hemoglobin assay testing ...................... 52
      Demographic data and information .............................. 52
   Data analysis ..................................................................... 53

5. Results ............................................................................ 55
   Description of the sample ................................................. 55
   Relationship between social support and self-care behaviors ..... 56
   Relationship between self-efficacy and self-care behaviors ...... 57
   Relationship between outcome expectations and self-care behaviors ..... 59
   Relationship between social support and glycemic control ....... 60
   Relationship between self-efficacy and glycemic control ........ 61
   Relationship between outcome expectations and glycemic control .... 62
   Differences in variables according to race ......................... 63

6. Discussion ....................................................................... 78
   Relationship between social support and self-care behaviors ..... 78
   Relationship between self-efficacy and self-care behaviors ....... 79
   Relationship between outcome expectations and self-care behaviors .... 81
   Relationship between social support and glycemic control ....... 82
   Relationship between self-efficacy and glycemic control ........ 83
   Relationship between outcome expectations and glycemic control .... 84
   Differences in variables according to race ......................... 84
   Limitations ...................................................................... 85
   Recommendations .......................................................... 87
   Implications for clinical practice ....................................... 89
   Conclusion ...................................................................... 90

References .......................................................................... 92
<table>
<thead>
<tr>
<th>Appendix</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>The Ohio State University IRB approval letters</td>
<td>99</td>
</tr>
<tr>
<td>B</td>
<td>The University of Kentucky IRB approval letters</td>
<td>108</td>
</tr>
<tr>
<td>C</td>
<td>Jewish Hospital approval letter</td>
<td>113</td>
</tr>
<tr>
<td>D</td>
<td>Script for obtaining informed consent</td>
<td>115</td>
</tr>
<tr>
<td>E</td>
<td>Information letter</td>
<td>117</td>
</tr>
<tr>
<td>F</td>
<td>Consent form for use at Jewish Hospital</td>
<td>120</td>
</tr>
<tr>
<td>G</td>
<td>Social Support Questionnaire</td>
<td>122</td>
</tr>
<tr>
<td>H</td>
<td>Self-Efficacy Questionnaire</td>
<td>129</td>
</tr>
<tr>
<td>I</td>
<td>Outcome Expectancy Questionnaire</td>
<td>134</td>
</tr>
<tr>
<td>J</td>
<td>Diabetes Activities Questionnaire</td>
<td>138</td>
</tr>
<tr>
<td>K</td>
<td>Thank-you letter</td>
<td>141</td>
</tr>
<tr>
<td>L</td>
<td>Kentucky Clinic approval letter</td>
<td>143</td>
</tr>
<tr>
<td>M</td>
<td>Consent form for use at the Kentucky Clinic</td>
<td>145</td>
</tr>
<tr>
<td>N</td>
<td>W-9 form</td>
<td>150</td>
</tr>
<tr>
<td>O</td>
<td>General information form</td>
<td>153</td>
</tr>
<tr>
<td>P</td>
<td>Lexington-Fayette County Health Department approval letter</td>
<td>155</td>
</tr>
<tr>
<td>Q</td>
<td>Consent form for use at the Lexington-Fayette County Health Department</td>
<td>157</td>
</tr>
<tr>
<td>R</td>
<td>Diabetes class schedule</td>
<td>162</td>
</tr>
<tr>
<td>S</td>
<td>Author (Sarason) permission letter</td>
<td>165</td>
</tr>
<tr>
<td>T</td>
<td>Author (Toobert) permission letter</td>
<td>167</td>
</tr>
<tr>
<td>U</td>
<td>Original Self-Efficacy Questionnaire</td>
<td>169</td>
</tr>
<tr>
<td>Code</td>
<td>Description</td>
<td>Page</td>
</tr>
<tr>
<td>------</td>
<td>----------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>V</td>
<td>Original Outcome Expectancy Questionnaire</td>
<td>173</td>
</tr>
<tr>
<td>W</td>
<td>Author (Hernandez) permission letters</td>
<td>176</td>
</tr>
<tr>
<td>X</td>
<td>Original Diabetes Activities Questionnaire</td>
<td>180</td>
</tr>
<tr>
<td>Y</td>
<td>Jewish Hospital Assessment Questionnaire</td>
<td>182</td>
</tr>
<tr>
<td>Z</td>
<td>Kentucky Clinic Assessment Questionnaire</td>
<td>188</td>
</tr>
<tr>
<td>AA</td>
<td>Kentucky Clinic history/ physical/ progress notes</td>
<td>193</td>
</tr>
</tbody>
</table>
LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1</td>
<td>Select demographic and diabetes characteristics of all subjects, Caucasians, and African-Americans</td>
<td>65</td>
</tr>
<tr>
<td>5.2</td>
<td>Differences in demographic and diabetes characteristics between races</td>
<td>67</td>
</tr>
<tr>
<td>5.3</td>
<td>Pearson product-moment correlation coefficients for social support with self-care behaviors of all subjects, Caucasians, and African-Americans</td>
<td>68</td>
</tr>
<tr>
<td>5.4</td>
<td>Pearson product-moment correlation coefficients for self-efficacy with self-care behaviors of all subjects, Caucasians, and African-Americans</td>
<td>69</td>
</tr>
<tr>
<td>5.5</td>
<td>Pearson product-moment correlation coefficients for outcome expectations with self-care behaviors for all subjects, Caucasians, and African-Americans</td>
<td>70</td>
</tr>
<tr>
<td>5.6</td>
<td>Pearson product-moment correlation coefficients for social support with glycemic control for all subjects, Caucasians, and African-Americans</td>
<td>71</td>
</tr>
</tbody>
</table>

xii
5.7 Pearson product-moment correlation coefficients for self-efficacy with glycemic control for all subjects, Caucasians, and African-Americans .................................................. 72

5.8 Pearson product-moment correlation coefficients for outcome expectations with glycemic control for all subjects, Caucasians, and African-Americans .................................................. 73

5.9 Differences in social support variables based on race ........................................ 74

5.10 Differences in self-efficacy variables based on race ........................................ 75

5.11 Differences in outcome expectation variables based on race .......................... 76

5.12 Differences in self-care behavior and glycosylated hemoglobin variables based on race .......................................................... 77
CHAPTER 1

INTRODUCTION

Diabetes mellitus (diabetes) affects more than 15.7 million individuals and is the seventh leading cause of death by disease in the United States (National Institute of Health, 2002a). Despite medical advances, there was no change in the diabetes-related mortality rate from 1983 to 1993 (U.S. Department of Health and Human Services, 1995). Approximately 2.3 million African-Americans in the United States have diabetes (National Institute of Health, 2002a). Death rates for individuals with diabetes are 27% higher for African-Americans than Caucasians (National Institute of Health, 2002b). Caucasian and African-American individuals with type 2 diabetes continue to experience preventable diabetes-related life-threatening complications despite medical advances and health care availability.

Social support may have a significant influence on health outcomes of individuals with type 2 diabetes. Greater support was found to be associated with better glycemic control (Edelstein & Linn, 1985; Eriksson & Rosenqvist, 1993; Griffith, Field, & Lustman, 1990; Schwartz, Springer, Flaherty, & Kiani, 1986; Wilson & Pratt, 1987). Social support also was found to be a strong predictor of self-care behaviors of
individuals with type 2 diabetes (Wang & Fenske, 1996; Wilson et al., 1986). Also, self-efficacy theory has served as a framework to help investigators understand diabetes-related behaviors and facilitate behavioral change (Glasgow et al., 1989; Hurley & Shea, 1992; Kavanagh, Gooley, & Wilson, 1993; Kingery & Glasgow, 1989; Skelly, Marshall, Haughey, Davis, & Dunford, 1995).

Social support, self-efficacy, and outcome expectations may be predictors of self-care behaviors and glycemic control of individuals with type 2 diabetes. However, most studies explored the relationships among these variables in Caucasian individuals and few have considered these relationships in the African-American population. Furthermore, there is limited research examining differences between Caucasians and African-Americans with diabetes.

Purpose

The purpose of this study was to examine the relationships of psychosocial variables (social support, self-efficacy, and outcome expectations) to diabetes self-care behaviors and glycemic control in Caucasian and African-American adults with type 2 diabetes. Theoretically, social support from family and friends is expected to enhance self-care behaviors and improve glycemic control. Similarly, high levels of self-efficacy and outcome expectations (beliefs that diabetes-related behaviors will lead to certain outcomes) are expected to positively influence self-care behaviors and improve glycemic control.

An understanding of the effects of social support, self-efficacy, and outcome expectations on self-care behaviors and glycemic control will better enable health-care
providers to assist clients with diabetes management. Further, an understanding of the relationships of these psychosocial variables in Caucasians and African-Americans with type 2 diabetes will allow health care providers to better predict factors that affect self-care behaviors and glycemic control. Do these psychosocial variables differ by race? If so, how can the health care provider best assist clients with diabetes management according to race?

Hypotheses

In order to examine the relationships of social support, self-efficacy, and outcome expectations to self-care behaviors and glycemic control in Caucasian and African-American subjects with type 2 diabetes, the following hypotheses were tested:

1. Social support is positively related to self-care behaviors in the total group, Caucasians, and African-Americans.

2. Self-efficacy is positively related to self-care behaviors in the total group, Caucasians, and African-Americans.

3. Outcome expectancy is positively related to self-care behaviors in the total group, Caucasians, and African-Americans.

4. Social support is positively related to glycemic control in the total group, Caucasians, and African-Americans.

5. Self-efficacy is positively related to glycemic control in the total group, Caucasians, and African-Americans.
6. Outcome expectancy is positively related to glycemic control in the total group, Caucasians, and African-Americans.

7. Social support, self-efficacy, outcome expectations, self-care behaviors, and glycemic control will differ by race of the subjects.

The study is written in six chapters. Following this introduction, Chapter 2 discusses the theoretical background upon which the hypotheses are based.

Chapter 3 consists of the literature review. Studies are selected that consider the same variables as the variables under investigation in the study. This chapter concludes with a summary of the findings from the literature review.

The research methods are discussed in Chapter 4. This chapter consists of a/an: (1) explanation of the study design; (2) definition of the sample; (3) discussion of the procedures; (4) description of the sites; and (5) discussion of the instrumentation. This chapter closes with a description of the statistical analyses used to test the research hypotheses.

The results of the study are presented in Chapter 5. Results are examined from the perspective of the hypotheses and the theoretical background upon which the hypotheses are based.

A discussion of the study's results is found in Chapter 6. The findings from the study are applied to professional practice in an effort to enhance health care providers' understanding of variables impacting diabetes control in Caucasians and African-Americans with type 2 diabetes. Chapter 6 concludes with a discussion of this study's limitations and recommendations.
CHAPTER 2

THEORETICAL BACKGROUND

The concepts of social support and self-efficacy provide the framework for this study. Social support and self-efficacy may have a significant influence on health outcomes of Caucasians and African-Americans with type 2 diabetes. Social support from family, friends, and/or significant others may enhance self-care behaviors and improve glycemic control. Similarly, high levels of self-efficacy and outcome expectations may positively influence self-care behaviors and improve glycemic control.

The first section of this chapter describes the concept of social support and briefly discusses the relationship between social support and health outcomes. The second section of this chapter discusses the concept of self-efficacy (derived from Bandura’s Social Cognitive Theory), a central concept underlying behavior. Specifically, the two principle components of Bandura’s theory, outcome expectations and efficacy expectations, will be defined and explained.

The Concept of Social Support

Social support, a multidimensional concept, has received increased interest by investigators in recent years. Thoits (1995) and Hupcey (1998) discussed the lack of
agreement about the definition of social support and the diverse ways of measuring social support. Although there is no universally accepted definition of social support, social support most often refers to the functional aspect of relationships, such as the degree to which relationships involve emotional concern (House & Kahn, 1985). Wallston, Alagna, DeVellis, and DeVellis (1983) defined social support as the comfort, information, or assistance an individual receives from one’s social network. Cobb (1976) suggested that social support is the provision of information that leads individuals to believe that they are cared for, loved, valued, esteemed, and part of a network of communication and mutual aid.

In this study, social support was operationally defined as the comfort, emotional concern, and assistance individuals receive from family, friends, and/or significant others. This definition was adopted from House and Kahn (1985), Wallston et al. (1983), and Cobb (1976). Social support may influence the health outcomes of individuals. The availability and quality of social support may directly affect an individual's ability to adapt to changes associated with chronic illnesses such as type 2 diabetes. Researchers suggest that there is a positive relationship between social support and health outcomes of individuals with type 2 diabetes (Edelstein & Linn, 1985; Eriksson & Rosenqvist, 1993; Griffith, Field, & Lustman, 1990; Schwartz, Springer, Flaherty, & Kiani, 1986; Wang & Fenske, 1996; Wilson et al., 1986; Wilson & Pratt, 1987). Specifically, social support may positively affect self-care behaviors and glycemic control of individuals with type 2 diabetes.
The Concept of Self-Efficacy

The concept of self-efficacy, derived from Bandura's Social Cognitive Theory, provides a link between self-perceptions and individual actions (Bandura, 1977). Bandura (1977, 1982) described self-efficacy as a cognitive process involving judgment of one's ability to perform specific behaviors required to produce certain outcomes. For example, individuals may believe that: (1) they can perform daily exercises; and (2) this exercise will lead to improved glycemic control. The amount of effort individuals will expend and how long they persist when confronted with obstacles or threatening situations is directly related to one's self-efficacy (Bandura, 1982). Since self-efficacy is a central concept underlying behavior, individuals with type 2 diabetes may be more willing to perform self-care behaviors and persist in performing these behaviors if they feel they are capable of doing well. In this study, self-efficacy was operationally defined as "individuals' beliefs about their abilities to perform diabetes self-care behaviors." This definition was adopted from Bandura (1977).

Two principle components of Bandura's theory of self-efficacy are outcome expectations and efficacy expectations (Bandura, 1977). Bandura (1977) defined an outcome expectation as, "...a person's estimate that a given behavior will lead to certain outcomes" (p. 193). An efficacy expectation was defined as, "...the conviction that one can successfully execute the behavior required to produce the outcomes" (Bandura, 1977, p. 193). In further explaining these two components, individuals may believe that a specific behavior will result in certain outcomes, but if they lack confidence that they can perform the behavior, such beliefs will not affect their behaviors (Bandura, 1977). Thus,
one must consider both outcome expectations and efficacy expectations in the study of type 2 diabetes subjects' self-efficacy. Efficacy expectations vary on three dimensions: magnitude, generality, and strength (Bandura, 1977). Magnitude refers to the ordering of tasks by difficulty. For example, the efficacy expectations of individuals may be restricted to simple tasks (drawing up of insulin without performing self-administration of the insulin) or extend to moderately difficult ones (drawing up of insulin and self-administration of the insulin). Generality indicates the extent to which efficacy expectations regarding one's experiences apply to other experiences. For example, the perceptions individuals have about their abilities to administer insulin while hospitalized may or may not generalize to unsupervised instruction in the home situation. The strength dimension refers to the extent of one's coping effort. For example, if individuals have strong efficacy expectations then they will persevere and follow the diabetes health behavior regimen regardless of the obstacles.

Bandura (1977) identified four primary sources of efficacy information: performance accomplishments, vicarious experience, verbal persuasion, and physiological states. Performance accomplishments are based on previous mastery experiences (e.g., previous experiences with diabetes or other chronic illnesses) and are the most dependable sources of information about one's capabilities. Seeing others perform activities (e.g., watching others perform diabetes-related skills in the classroom or on videotape) and making inferences based on social comparison is categorized as a vicarious experience. Verbal persuasion (e.g., encouragement of diabetes educators and family members) is the act of being led, through suggestion, into believing that one can
perform a specific task or behavior. Individuals rely on information from their physiological state (e.g., anxiety or fatigue when first diagnosed with type 2 diabetes) in determining their capabilities. For example, the individual with type 2 diabetes may perceive anxiety and fatigue as indicants of inefficacy. According to Bandura (1977), an individual selectively obtains information from these sources. These four sources of efficacy information may affect an individual's belief in his or her ability to perform diabetes-related self-care behaviors.
CHAPTER 3

LITERATURE REVIEW

In this chapter, literature relevant to the study is reviewed. The chapter is divided into five major sections. In the first section of this chapter, the chronic condition of diabetes and its potential complications are discussed. The relationships between social support and diabetes self-care behaviors and glycemic control are discussed in the second section of the chapter. In the third section of this chapter, there is a discussion of the relationships between self-efficacy and diabetes self-care behaviors and glycemic control. In the final two sections of this chapter, health disparities of Caucasians and African-Americans and the health beliefs of the two racial groups are discussed.

The Chronic Condition of Diabetes Mellitus

Diabetes, a chronic condition, is characterized by abnormalities in glucose homeostasis resulting in elevated blood glucose levels (hyperglycemia). This hyperglycemia is caused by the lack of insulin production or the improper use of insulin by the body. There are primarily two types of diabetes: type 1 (previously known as insulin-dependent diabetes mellitus or juvenile-onset diabetes) and type 2 (previously known as non-insulin-dependent diabetes or adult-onset diabetes). With type 1 diabetes,
there is an absolute lack of endogenous insulin caused by beta cell destruction. Type 2 diabetes is associated with a relative insulin deficiency and/or insulin resistance rather than a total deficit (Chlebowy & Wagner, 2001).

Diabetes is a major health concern in the United States. Each year, it is estimated that 798,000 individuals will be diagnosed with diabetes (National Institute of Health, 2002a). Complications related to diabetes include: blindness, amputation, kidney disease, heart disease, hypertension, stroke, nervous system disease, and dental disease (National Institute of Health, 2002a). It is estimated that 90-95% of the 15.7 million individuals in the United States with diabetes have type 2 diabetes (National Institute of Health, 2002a). Health care costs, related costs for diabetes treatment, and opportunity costs of lost productivity are estimated at nearly $98 billion annually (National Institute of Health, 2002a).

In the United States, type 2 diabetes is more common among certain racial groups (African-Americans, Hispanic Latino Americans, Mexican Americans) than among other racial groups (National Institute of Health, 2002a). Type 2 diabetes afflicting African-Americans is a major national health concern. African-Americans are 1.7 times more likely to have diabetes than Caucasians of similar age (National Institute of Health, 2002b). Approximately 25% of African-Americans in the United States between the ages of 65 and 74 have diabetes (National Institute of Health, 2002b). In comparison with other racial groups, African-Americans experience higher incidence of and greater disability from three of the major diabetes-related complications: diabetic retinopathy, amputations, and end stage renal disease (ESRD) (National Institute of Health, 2002b).
Diabetes is the leading cause of new cases of blindness in individuals ages 20-74 (National Institute of Health, 2002a). Each year 12,000 to 24,000 individuals become blind because of diabetes (National Institute of Health, 2002a). Diabetic retinopathy, deterioration of blood vessels in the eye resulting from high serum glucose levels, is 40% to 50% higher in African-Americans than Caucasians (Harris, Klein, Cowie, Rowland, & Byrd-Holt, 1998).

Diabetes is a frequent cause of non-traumatic lower limb amputations. Diabetes accounts for more than half of the lower limb amputations in the United States (National Institute of Health, 2002a). African-Americans are much more likely than other racial groups (Caucasians, Hispanics) to experience lower limb amputations (National Institute of Health, 2002b). Lavery et al. (1996) found diabetes-related amputations were 1.72 and 2.17 times more likely in African-Americans compared with non-Hispanic whites and Hispanics respectively. In 1994, there were approximately 13,000 amputations among African-Americans with diabetes (National Institute of Health, 2002b).

Diabetes is the leading cause of ESRD in the United States (National Institute of Health, 2002a). African-Americans with diabetes are four times more likely than Caucasians to develop ESRD (Cowie et al., 1989). More than 27, 258 new cases of ESRD were diagnosed in African-Americans in 1995 (U.S. Renal Data System, 1997). Pugh, Medina, Cornell, and Basu (1995) found that African-Americans were at increased risk for developing ESRD with 84.3% of the cases caused by type 2 diabetes.

The diabetes-related mortality rate continues to be a major concern in the United States. Since African-Americans are more likely than other racial groups to suffer from
the complications of type 2 diabetes, they often experience a higher diabetes-related mortality rate. In fact, the death rates for African-Americans with diabetes are 27% higher than Caucasians (National Institute of Health, 2002b).

An increasing percentage of the American population is over the age of 65. It is estimated that 18.4% of individuals in this age group have diabetes. This growing elderly population is presented with the challenges of adapting to specific diabetes health-behavior regimes.

Individuals with type 2 diabetes are presented with the challenges of managing health-behavior regimens to prevent or minimize the diabetes-related complications. These regimens include: 1) following a prescribed diet plan, 2) administering oral medications and/or insulin, 3) engaging in daily exercise, and 4) performing blood glucose monitoring. Adaptation to health-behavior regimes with accompanying health-behavior modifications may improve the health of those afflicted by this chronic condition and prevent life-threatening diabetes-related complications.

Despite medical advances and health care availability, Caucasians and African-Americans with type 2 diabetes continue to experience diabetes-related complications. Also, African-Americans continue to experience diabetes-related complications at much higher rates than other racial groups. There is a definite need to better understand the relationships of psychosocial variables (e.g., social support, self-efficacy, and outcome expectations) to self-care behaviors and glycemic control in Caucasians and African-Americans with type 2 diabetes. Perhaps a better understanding of these variables will lead to lower rates of diabetes-related complications in these racial groups.
Social Support and Self-Care Behaviors

Investigators have examined the relationship of social support and self-care behaviors in individuals with type 2 diabetes. Wilson et al. (1986) studied the relationships of demographic and psychosocial variables to self-care behaviors and glycemic control in 208 adults (97.8% Caucasian) with type 2 diabetes. The Interpersonal Support Evaluation List (ISEL), a 40-item questionnaire, assessed perceived availability of general social support. This questionnaire assessed four functions of social support: (1) appraisal (perceived availability of individuals with whom to talk about difficulties); (2) belonging (perceived availability of persons with whom to do things); (3) tangible (perceived availability of internal goods); and (4) self-esteem (perceived availability of praise from others or from social comparisons) (Wilson et al., 1986, p. 616).

Approximately 25% of the variance in self-care behaviors was explained by demographic and psychosocial variables with health beliefs and social support being the most consistent and strongest predictors of self-care behaviors. The psychosocial variables (in order of importance) most predictive of adherence to self-care behaviors were health beliefs, social support, knowledge, anxiety, and depression.

Wang and Fenske (1996) examined the relationships among the source of support, universal self-care, and health-deviation of self-care behaviors in 73 Caucasian and two African-American adults with type 2 diabetes. A questionnaire developed by one of the investigators assessed subjects’ social interaction patterns. Subjects who received support from friends in addition to family support reported higher universal and health-
deviation self-care behaviors than those without support. Social support explained 23% of the variance in universal self-care and 17% of variance in health-deviation self-care.

Boehm, Schlenk, Funnell, Powers, and Ronis (1997) examined how the components of psychosocial adjustment to diabetes predict adherence to nutrition recommendations based on completion of contingency contracts in 117 adults with type 2 diabetes. Contingency contracting was defined as the process in which the diabetes educator and subject negotiate a written, individualized, and signed agreement specifying the behavior to be performed and the positive consequences associated with the performed behavior. The racial composition of the sample was not reported and racial differences were not determined. The Diabetes Care Profile (DCP), comprised of 10 components of psychosocial adjustment, measured perceived diabetes-specific social support and support ratio (e.g., 1.0 support ratio indicates that received support equaled desired support). Subjects who reported a higher support ratio (received more diabetes-specific social support than desired) and higher regimen adherence were significantly less likely to participate in contingency contracting.

In a similar study of 200 subjects with type 2 diabetes, Garay-Sevilla et al. (1995) evaluated adherence to diet and medication, knowledge of diabetes, social support, glycemic control, family structure and functioning, and complications. The racial composition of the sample was not reported and racial differences were not investigated. A modified version of the Diabetes Social Support Questionnaire assessed subjects’ perception of the support they received from family and friends with regard to diabetes treatment. Social support was assessed on the basis of subjects’ perception of available
support systems to help them adhere to their diabetes treatment plans. Higher adherence to diet was associated with more years since diagnosis and with greater social support. Higher adherence to medication was associated with the older age of spouse and greater social support. Therefore, adherence to diet and medications was found to be positively associated with social support.

There has been recent interest in the relationship between social support and weight control in individuals with type 2 diabetes. Tillotson and Smith (1996) assessed the ability of social support and internal diabetes locus of control to predict adherence to a weight-control regimen in 465 middle-aged and older adult men and women (61.9% African-American, 38.1% Caucasian) with type 2 diabetes. Using a 5-point Likert scale, subjects verbally reported: (1) how much help they receive with regard to the diabetes regime; and (2) the degree to which their most supportive person shows concern about their health, shows warmth or friendliness, and makes them feel worthwhile. Social support and internal locus of control were found to be modest but statistically significant predictors of weight control. Racial differences were not examined in this study. Wilson and Pratt (1987) similarly found that weight loss and improved glycemic control occurred within groups receiving both diabetes education and peer support.

Bailey and Lherisson-Cedeno (1997) studied the health practices, outcomes, and psychosocial variables (locus of control and social support) of 80 Caucasians and 24 African-Americans with type 2 diabetes. The Support Behaviors Inventory (SBI) measured general social support. In addition, a modified version of the Social Support Questionnaire assessed diabetes-specific social support. Social support was
conceptualized as: (1) emotional support (e.g., esteem, affection); (2) information support (e.g., suggestions, advice); (3) appraisal support (e.g., feedback); and (4) instrumental support (e.g., labor, money) (Bailey & Lherisson-Cedano, 1997, p. 67). African-Americans had significantly higher glycosylated hemoglobin levels and body mass indices than Caucasians. No significant differences were found on psychosocial variables. Social support was found to be more important to diabetes practices and health among African-Americans. Health care practices that enhance social support may be effective in improving the health practices and outcomes of African-Americans with type 2 diabetes.

In a study of 191 adults (14% African-American) with type 2 diabetes, Connell (1991) examined the relationship of psychosocial issues on self-care behaviors. Racial differences were not examined in this study. The 24-item Social Provisions Scale (SPS) assessed perceived availability of support. The majority of the subjects (92%) felt that their family and friends accepted them and their diabetes conditions, 69% felt listened to, and 55% received encouragement and reassurance regarding diabetes management. More subjects reported receiving help with taking medications and following a meal plan, however, than reported wanting help with these self-care activities.

In a similar study, Albright, Parchman, and Burge (2001) investigated the relationship of social context on self-care behaviors in 397 adult subjects with type 2 diabetes. The racial composition of the sample was not reported and racial differences were not examined. A 60-item questionnaire developed by the investigators assessed subjects’ satisfaction with their diabetes care, barriers to diabetes care, and self-care
behaviors. Social context, specifically the family was associated with self-care behaviors (e.g., exercise, medications, diet).

Different studies conceptualized social support in different ways. Various instruments were used to measure social support and self-care behaviors adding to the difficulty in interpreting the findings. However, researchers suggest that social support may be a predictor of self-care behaviors of individuals with type 2 diabetes. The majority of studies explored the relationship between social support and diabetes self-care behaviors of Caucasian individuals and few have considered this relationship in the African-American population. It is unclear how social support may affect self-care behaviors in the African-American population. This study will examine the relationship of psychosocial variables (social support, self-efficacy, and outcome expectations) to diabetes self-care behaviors and glycemic control in these two racial groups.

Social Support and Glycemic Control

Greater social support has been found to be associated with better glycemic control in individuals with type 2 diabetes. Edelstein and Linn (1985) studied the role of the family environment in the metabolic control of 97 adults (middle to lower-middle class men) with diabetes. The sample was comprised of 80% Caucasian subjects and the mean age was 55 years. Racial differences were not investigated in this study. The Family Environment Scale measured aspects of family functioning. The scale specifically assessed subjects' perceptions of patterns of family relationships, personal growth, and the family's decision-making abilities. Subjects in better control of their diabetes perceived their families to be low in organization and conflict and oriented toward

18
achievement. It was suggested that less organization and lower conflict among family members creates a more relaxed environment and greater support for better metabolic control. The high achievement environment appeared to create responsibility towards success that enhanced disease management.

A similar study investigated the influence of perceived social support on glycemic control in individuals with type 2 diabetes. Eriksson and Rosenqvist (1993) examined the influence of perceived social support on glycemic control in 76 newly diagnosed men and women with type 2 diabetes and the effect of gender and social support. The racial composition of the sample was not reported and racial differences were not investigated. An 18-item social support questionnaire was developed by the investigators to assess the: (1) availability of and satisfaction with functional support; and (2) three functions of social support (emotional, practical, informative). Male subjects with high support had better fasting blood glucose levels than highly supported females. Males with high satisfaction regarding social support had better fasting blood glucose levels than female and low supported male groups.

Connell, Fisher, and Houston (1992) examined the relationship between social support and diabetes outcomes in Caucasians and African-Americans with type 2 diabetes. The SPS was used to assess perceived availability of social support. In a study of 191 subjects (110 women, 14% African-American), women and men did not differ significantly in the amount of received or desired diabetes-specific social support. For women and men, desired diabetes-specific support was positively associated with
glycosylated hemoglobin. Also, Caucasians had lower glycosylated hemoglobin values than African-Americans, thus indicating better glycemic control.

In a similar study, Schwartz, Coulson, Toovy, Lyons, and Flaherty (1991) evaluated the relationship between social support and glycemic control in 112 subjects over time. The racial composition of the sample was not reported and racial differences were not investigated. The Social Support Network Inventory (SSNI) measured perceived social support and identified social support providers. Decrease in social support predicted a worsening of longer-term control over a three-month period as measured by an increase in glycosylated hemoglobin. Social support was found to be important for diabetes management and control.

In a similar study, Heitzmann and Kaplan (1984) investigated the role of social support on glycemic control. The sample was comprised of 37 subjects (18 women, 19 men) with type 2 diabetes. The racial composition of the sample was not reported and racial differences were not investigated. The Social Support Questionnaire (SSQ) measured the number of social support individuals and subjects' satisfaction with these individuals. For women, social support satisfaction was associated with lower glycosylated levels. Conversely, however, higher social support satisfaction was negatively associated with glycemic control for men.

In a study of 169 subjects (67% Caucasian), O'Connor, Crabtree, and Abourizk (1992) examined those characteristics that predict improvement in glycemic control. Racial differences were not investigated. Specifically, data on demographic variables, disease characteristics, and glycemic control were obtained at baseline as subjects were
referred to an outpatient diabetes education and care program. Follow-up measurements of glycosylated hemoglobin were obtained two months later to identify characteristics associated with improved glycemic control. A standardized instrument, including items from other social support and family function scales, assessed social support and family functioning. Social support, knowledge of diabetes self-care, age, race and sex were not significant predictors of improved glycosylated hemoglobin levels.

In a study of 131 subjects (46% Caucasian and 46% African-American), Murphy, Williamson, and Nease (1994) similarly found that although supportive family members were available to most individuals with type 2 diabetes, the mere presence of these members was not necessarily related to a positive influence on glycemic control. No statistical relationship was found between the supportive family member's gender or family relationship and the subject's race. Also, no statistical relationships were found between demographic variables (age, age at diagnosis, years with diabetes, gender, race, marital status, and payment type) and glycemic control. Racial differences were not investigated in this study. An instrument developed by the investigators assessed the: (1) presence/absence of family members providing diabetes-specific help; and (2) subjects' relationships with family members.

Kaplan and Hartwell (1987) studied the relationship between social support satisfaction and glycemic control in 76 adults with type 2 diabetes. The racial composition of the sample was not reported and racial differences were not investigated. The SSQ measured the number of social support individuals and subjects' satisfaction with these individuals. The relationship between social support satisfaction and glycemic
control differed for women and men. High social support satisfaction was positively correlated with glycemic control for women. For men, significant negative correlations were found between social support satisfaction and blood glucose and glycosylated hemoglobin levels. Also, for men, support network size was not associated with program participation whereas, for women, a negative correlation existed between support network size and program participation.

Investigators examined the relationship of social support, life stress, and glucose regulation in individuals with type 2 diabetes. Griffith et al. (1990) examined the relationship of these variables in 80 adults with diabetes. The sample was comprised of 67.5% Caucasian and 32.5% African-American subjects. Racial differences were not examined. A visual analog scale developed by the investigators measured social support satisfaction. Neither social support nor life stress was found to be significantly associated with glucose control. However, with high life stress, subjects who reported high social support had significantly better glucose control than low support subjects. Similarly, Schwartz et al. (1986) evaluated the relationship of these variables in 19 adults with diabetes. The racial composition of the sample was not reported and racial differences were not investigated. The SSNI measured perceived social support and identified social support providers. Subjects were asked to rate social support providers with regard to availability, closeness, reciprocity, and emotional support. A higher number of life events was associated with a higher percentage of abnormal glucose results. Also, improved social support was associated with a higher percentage of normal glucose results.
A few investigators have examined the effect of social support groups on glycemic control. Wilson and Pratt (1987) assessed: (1) whether supportive behavior could be brought about by peers in a diabetes education class; and (2) the effects of diabetes education (with social support added) on weight loss and glycemic control in 79 adults (80% female). The racial composition of the sample was not reported and racial differences were not investigated. A modified version of the Arizona Social Support Questionnaire measured the level of peer support. Moderate weight loss and improved glycemic control occurred post-intervention only in the groups with education plus peer support. Peer support was found to be higher in groups where educators were present.

In a similar study of 11 subjects, Oren, Carella, and Hellma (1996) examined the implications of a support group and its impact on glycosylated hemoglobin levels. The sample was comprised of 81.8% Caucasian, 9.1% African-American, and 9.1% Asian-American subjects. Racial differences were not investigated. Subjects were studied over a 17-week period with glycosylated hemoglobin levels obtained before and after support group participation. The Duke-UNC Functional Support Questionnaire assessed subjects' perception of their degree of family/social support. The questionnaire measured two factors: (1) confidant support (relationships where important life situations are discussed; and (2) affective support (caring or emotional concern). Although the support group showed a trend for lowering glycosylated hemoglobin levels, the change was statistically not significant.

Gilden, Hendryx, Clar, Casia, and Singh (1992) investigated whether knowledge or psychosocial and glycemic benefits of an education program were enhanced by a support
group for male subjects with type 2 diabetes. The racial composition of the sample was not reported and racial differences were not investigated. Previously developed instruments by the investigators assessed diabetes knowledge and psychosocial aspects of diabetes care. Subjects that received the education program and support group sessions and those that received only the education program exhibited less stress, greater family involvement, and better glycemic control than subjects who received neither intervention.

In contrast to the findings cited in the previous studies, the effect of a social support group was not found to be associated with better metabolic control. Maxwell, Hunt, and Bush (1992) evaluated the effect of a support group that was offered with an existing diabetes-training program. The sample was comprised of 204 subjects (racial composition not reported) who were randomized into two groups: (1) the control group received outpatient diabetes training; and (2) the experimental group received the same training plus were offered eight support group meetings. Subjects reported frequencies of diabetes management behaviors on a 4-point scale ranging from “never practicing a behavior” to “practicing it daily.” Fasting serum glucose, glycosylated hemoglobin, triglyceride, total cholesterol, and high-density lipoprotein cholesterol levels were obtained to evaluate metabolic control. Experimental subjects showed no additional improvement in metabolic control and self-care behaviors after attending the support group meetings. However, the majority of experimental subjects felt that the group meetings provided education, motivation to adhere to the diabetes regimen, and a means of helping them cope with diabetes-related problems. Racial differences were not investigated in this study.
There is limited research that has examined the relationship of demographic and psychosocial variables to glycemic control in individuals with type 2 diabetes. Wilson et al. (1986) studied the relationships of demographic variables (age and sex) and psychosocial variables (depression, anxiety, stress, social support, knowledge, and diabetes-specific health beliefs) to self-care behaviors and glycemic control in 208 (97.8% Caucasian) middle-aged and older adults with type 2 diabetes. Neither demographic nor psychosocial variables were significantly related to level of glycemic control. Murphy et al. (1994) and O’Connor et al. (1992) similarly found that demographic variables (e.g., age and race) were not correlated with glycemic control.

Different studies conceptualized social support in different ways. Various instruments were used to measure social support adding to the difficulty in interpreting the findings. However, in the majority of existing studies, glycosylated hemoglobin levels were obtained to measure glycemic control. Researchers suggest that social support may be a predictor of glycemic control of individuals with type 2 diabetes. The availability and quality of social support may affect an individual’s ability to adapt to the changes associated with this chronic disease thus contributing to better glycemic control.

The relationship between social support and glycemic control is not always clear. Some studies support this relationship and others do not. It is unclear why social support may not always predict better glycemic control. Demographic variables (e.g., race, age, sex, education, and socioeconomic status) must be further studied to better understand this complex relationship.
Many investigators have explored the relationship between social support and glycemic control in individuals with type 2 diabetes. However, most studies have explored this relationship in Caucasian individuals and few have considered this relationship in the African-American population. It is unclear how social support may affect glycemic control in the African-American population. The relationship between social support and glycemic control may be different for Caucasians than for African-Americans. This study will examine this relationship in Caucasian and African-American individuals with type 2 diabetes. Specifically, this study will examine the relationship of psychosocial variables (social support, self-efficacy, and outcome expectations) to diabetes self-care behaviors and glycemic control in these two racial groups.

Self-Efficacy and Health-Related Behaviors

Self-efficacy theory (SET) has served as the framework for a variety of studies to help investigators understand behavior and facilitate behavioral change. A few studies of health-related behaviors will first be reviewed. Studies of diabetes self-care behaviors will later be reviewed in more detail.

The theory of self-efficacy has been studied in various health-related areas. Bernier and Avard (1986) found a significant relationship between weight change and efficacy measures during follow-up periods. Self-efficacy has been used as a framework for understanding the treatment of obesity (Clark, Abrams, Ni aura, Eaton, & Rossi, 1991). DiClemente, Prochaska, and Gibertina (1985) suggested that self-efficacy appears to be useful in developing interventions to promote change and prevent relapse among smokers. Godding and Glasgow (1985) revealed that self-efficacy and outcome
expectancy scales were useful in predicting smoking behaviors and strong correlations existed between the self-efficacy and smoking behaviors at follow-up periods. A strong correlation was found between self-efficacy and quality of life and between self-efficacy and mood of cancer clients (Cunningham, Lockwood, & Cunningham, 1991). Self-efficacy was positively related to postoperative behaviors that enhanced recovery and minimized complications (Oetker-Black, Hart, Hoffman, & Geary, 1992).

SET has been used in health-related studies pertaining to addictive behaviors and chronic illnesses. Strecher, DeVeillis, Becker, and Rosenstock (1986) conducted an in-depth review of 21 studies and found that the self-efficacy concept was a major predictor of behavioral change and maintenance. Empirical studies have supported Bandura's belief that self-efficacy affects behavioral change and maintenance. Self-efficacy consistently has demonstrated to be a powerful predictor of behavior.

Self-Efficacy and Diabetes Self-Care Behaviors

Researchers suggest that there is a positive relationship between self-efficacy and self-care behaviors of diabetes individuals. Hurley and Shea (1992) explored the relationship between self-efficacy and self-care behaviors of 142 adults who administer insulin for diabetes management. The racial composition of the sample was not reported and racial differences were not investigated. Self-efficacy was defined as, “...judgments of one’s own capability to monitor, plan, and carry out diabetes activities of daily living...” (Hurley & Shea, 1992, p. 148). The Insulin Management Diabetes Self-Efficacy Scale (IMDSES) measured self-efficacy. A positive relationship was found to exist between self-efficacy and self-care behaviors.
Kavanagh et al. (1993) examined diabetes adherence to treatment regimens (glucose testing, diet, exercise) and sustained diabetes control. Thirty-eight percent of the sample consisted of subjects with type 1 diabetes and 62% had type 2 diabetes. The racial composition of the sample was not reported and racial differences were not investigated. Self-efficacy was measured by asking subjects to rate their confidence to follow recommended treatment programs in three areas (glucose testing, diet, exercise). Results revealed that self-efficacy was an effective predictor of adherence in the areas of diet and exercise. Although this study suggested a positive relationship between self-efficacy and self-care behaviors, an important area of diabetes management (medications) was not assessed.

Skelly et al. (1995) examined the extent to which perceptions of self-efficacy and confidence in outcomes, disease characteristics, and specific demographic variables (age, duration of diabetes, and presence of complications) affect an individual’s adherence to diabetes self-care behaviors (glucose testing, medication administration, diet, and exercise) on two occasions (baseline and 4 to 5 month follow-up). The sample consisted of 118 African-American women with type 2 diabetes who were receiving care at an outpatient diabetes clinic. The Self-Efficacy Questionnaire (SEQ) assessed subjects’ confidence in their abilities to perform diabetes-related behaviors (glucose testing, eating habits, exercise, medication-taking). The Outcome Expectancies Questionnaire (OEQ) measured perceived consequences with adherence to the diabetes regimen. Self-efficacy was found to be an important variable in relation to adherence to diabetes regimes and subjects felt most efficacious in regards to their medication and glucose monitoring
abilities and least efficacious in regards to their abilities to adhere to dietary and exercise regimes. Subjects were positive in their outcome expectancies at baseline and follow-up. Over time the observed higher levels of self-efficacy were not statistically different from baseline.

In a study of 136 adult subjects with type 2 diabetes, Ludlow and Gein (1995) examined the relationships among diabetes self-efficacy, diabetes self-care, and glycosylated hemoglobin levels. The racial composition of the sample was not reported and racial differences were not investigated. A slightly modified version of the IMDSES measured levels of self-efficacy in four areas (general management, diet, medication-taking, exercise). Self-efficacy was defined as, “...one’s capability to monitor, plan, and perform daily activities required to manage his/her diabetes...” (Ludlow & Gein, 1995, p. 11). Statistically significant relationships were found between the variables. The findings were: (1) subjects with higher levels of self-efficacy performed more diabetes self-care behaviors; (2) subjects who reported higher levels of self-care (e.g., diet, exercise, and general management) had lower glycosylated hemoglobin levels; and (3) subjects who reported higher levels of diet self-care and those with higher levels of general management self-efficacy and diet self-efficacy had lower glycosylated hemoglobin levels.

Several researchers have addressed Bandura’s theoretical components of outcome expectations and efficacy expectations in studying diabetes self-care behaviors. In a sample of 127 subjects (98.4% Caucasian) with type 2 diabetes, Glasgow et al. (1989) found that exercise and dietary modifications had the highest outcome expectations but
were viewed by subjects with type 2 diabetes as the most difficult to achieve. A modified version of the Outcome Expectations Scale assessed subjects' perceptions of the consequences of performing diabetes self-care behaviors. Subjects' self-efficacy scores for adhering to the dietary regime were significantly lower than the scores for medication administration. A modified version of the Diabetes Self-Efficacy Scale measured subjects' confidence in their ability to perform a series of diabetes self-care behaviors in four regimen areas (glucose testing, eating habits, exercise, medication-taking). Racial differences were not investigated.

In a sample of 127 subjects (98.4% Caucasian) with type 2 diabetes, Kingery and Glasgow (1989) examined the relationship between: (1) self-efficacy and self-care behaviors; and (2) outcome expectations and self-care behaviors. A modified version of the SEQ assessed subjects' confidence in their abilities to perform a series of regimen behaviors (glucose testing, eating habits, exercise, medication-taking). A modified version of the OEQ assessed subjects' perceptions of the consequences of performing diabetes self-care behaviors (glucose testing, eating habits, exercise, medication-taking). Analyses revealed that outcome expectations and efficacy expectations were moderately strong predictors of self-care in the area of exercise and weaker predictors in the areas of blood glucose monitoring and diet. In contrast to these findings, Skelly et al. (1995) found that African-American type 2 diabetes subjects' outcome expectations had an effect on blood glucose monitoring and efficacy expectations had the greatest effect on dietary adherence and exercise during the initial period but the effects of self-efficacy appeared to be unstable over time.
Aljasem, Peyrot, Wissew, and Rubin (2001) investigated the relationships of diabetes specific treatment barriers and self-efficacy with self-care behaviors. The sample was comprised of 309 adults with type 2 diabetes. The racial composition of the sample was not reported and racial differences were not investigated. A modified version of the Grossman Self-Efficacy for Diabetes Scale assessed the subjects' confidence in their abilities to perform designated diabetes treatment activities. The investigators adopted Hurley and Shea’s (1992) definition of self-efficacy. Subjects who reported greater self-efficacy: (1) performed more frequent blood glucose monitoring; (2) adhered more closely to their dietary and pharmacologic regimes; and (3) engaged less in binge eating.

In the various studies, self-efficacy was similarly conceptualized as “individuals’ beliefs about their ability to carry out diabetes self-care behaviors.” Several researchers suggest that there is a positive relationship between outcome expectations and efficacy expectations and type 2 diabetes self-care behaviors. However, most studies have explored this relationship in Caucasian individuals and few have considered this relationship in the African-American population. Since African-Americans continue to experience diabetes-related complications at much higher rates than some other racial groups, there is a definite need to better understand the relationship of these variables in this racial group. An understanding of this relationship will assist individuals in meeting the health care needs of African-Americans with type 2 diabetes.
Health Disparities Between the Races

Despite the progress made in health care in recent years, there is a significant disparity in the quality of health between Caucasians and African-Americans. African-Americans experience the highest rates of mortality from cancer, heart disease, cerebrovascular disease, and HIV/AIDS than any other U.S. racial or ethnic group (Institute of Medicine, 2002a). In fact, African-Americans have the highest morbidity and mortality rate in almost every category of disease (Carter, 1994). Some health problems African-Americans are confronted with include: tobacco use, alcohol consumption, nutritional deficiencies, obesity, and sexually transmitted diseases (Neighbors, Braithwaite, & Thompson, 1995). The high death rate of African-Americans may be significantly reduced by behavioral modifications in each of these problem areas. The disparities experienced by African-Americans may be related to behavior and magnified by inadequate health care.

Levin, Mayer-Davis, Ainsworth, Addy, and Wheeler (2001) compared the prevalence of chronic conditions (e.g., diabetes, cardiovascular disease, hypertension, overweight) and health behavioral patterns (e.g., smoking, poor nutrition, physical inactivity) among Caucasians and African-Americans. The sample consisted of 4,150 Caucasians and 1,413 African-Americans. African-Americans had higher prevalence of diabetes, hypertension, overweight conditions, poor health, physical inactivity, and poor diet than Caucasians.

Recently, the Institute of Medicine (2002b) investigated the racial and ethnic differences in health care and the causes of health care disparities. The Institute of
Medicine (2002b) found that: (1) racial minorities are less likely to have routine medical procedures than Caucasians; and (2) even with income and insurance status controlled, minorities receive a lower quality of health care than nonminorities. The Institute of Medicine recommended that: (1) health care providers, clients, and society be well informed of the existing health care disparities; and (2) clients and providers receive education regarding how to access health care for minorities.

Researchers have recently investigated the health patterns of African-Americans. Gregg et al. (2001) examined the levels of diabetes preventive care services and glycemic and lipid control among 625 adult African-American subjects with diabetes. Annual examinations (eye, foot, lipoid) were reported by 70% to 80% of the sample with only 46% reporting glycosylated hemoglobin testing. Sixty percent of the sample had a glycosylated level greater than 8% and 25% had a level greater than 10% (indicative of poor glycemic control). Glycemic control, lipid control, and diabetes-management behavioral patterns were related to availability of health insurance. Subjects without health insurance were more than twice as likely to have poor glycemic and lipid control and inadequate preventive care as those with health insurance.

In a similar study, Chin, Zhang, & Merrell (1998) investigated whether African-Americans receiving Medicare benefits were at increased risk for poor quality of care, morbidity, and high resource utilization. The sample consisted of 1,376 subjects (62% women, 14% African-American). African-Americans were less likely to have lipid testing, glycosylated hemoglobin measurements, ophthalmologic visits, and influenza vaccinations than Caucasians. However, African-Americans and Caucasians had a
similar number of diabetes-related complications and number of comorbidities. African-Americans had fewer annual physician visits and were more likely to visit the emergency room than Caucasians. Similarly, Ayanian, Weissman, Chasan-Tabers, and Epstein (1999) found that African-Americans were likely to receive a lower quality of basic clinical services even when insurance status, income, and age were considered.

Witucki and Wallace (1998) examined the differences between 269 Caucasian and 280 African-American elders with diabetes in functional and health status and use of community-based services. The average age of subjects was similar for both groups (77.16 years for Caucasians, 76.49 for African-Americans). There were no significant differences between the groups in activities of daily living difficulty (e.g., bathing, dressing, eating) or health status (presence of comorbidity and total number of health problems reported) as a measure of functional status. African-Americans reported fewer instrumental activities of daily living (e.g., hot and cold food preparation and transportation difficulties) than Caucasians. Use of community-based services was significantly lower among African-Americans with both groups underutilizing services.

Health Beliefs of Caucasians and African-Americans

Health beliefs, behaviors, and expectations are influenced by one's culture. These beliefs, behaviors, and expectations affect the ways in which individuals manage their chronic illnesses. There has been a heightened interest in recent years to examine the health beliefs and attitudes of different racial groups. The health beliefs of Caucasians and African-Americans have specifically been addressed in various health-related studies.
Schoenberg and Dringle (2001) recently examined the barriers to engaging in diabetes self-care behaviors among individuals with type 2 diabetes. The sample consisted of 51 subjects (47% Caucasian, 53% African-American). African-Americans indicated more financial, visual, and pain barriers to self-care than Caucasians. Both Caucasians and African-Americans reported a reluctance to exercise and check blood glucose levels. Most subjects indicated that they routinely visited their physicians and adhered to their medication regimes.

Researchers have examined racial differences in women's perceptions concerning breast cancer screening procedures. Douglass, Bartolucci, Waterbor, and Sirles (1995) identified differences in 157 Caucasian and 117 African-American women's health beliefs and practices regarding early breast cancer detection (use of mammography and clinical breast examination). Although no significant difference in frequency of use of mammography and breast examination was found between the two racial groups, Caucasians had a significantly higher mean score for perceived barriers to breast examination and a higher mean score for benefits of breast examination. In a similar study of 625 African-American, Asian-American, Caucasian, Latino, and Pacific Islander women, African-Americans had a significantly more positive attitude toward breast cancer screening procedures than did the other racial groups (Dibble, Vanoni, & Miaskowski, 1997). Hughes et al. (1997) examined knowledge about the inheritance of breast cancer and attitudes about genetic testing for breast-ovarian susceptibility in 407 Caucasian and African-American women at increased risk. African-Americans had more
positive attitudes about the benefits of genetic testing and had lower levels of knowledge as compared to Caucasians.

Larson, Colangelo, and Goods (1998) conducted two studies to examine health perceptions and functional health status among Caucasians and African-Americans. The first study of 106 hospitalized Caucasians and 170 African-Americans revealed that African-Americans rated their health more positively than did Caucasians. However, there were no significant differences between the two racial groups in ratings of overall health. For Caucasians, general health functioning was the significant predictor of health at the current stage of recovery. African-Americans perceived general health functioning and bodily pain as the most significant predictors of health and had higher ratings of health at their current stage of recovery. General health functioning was the most important predictor of Caucasians' ratings of overall health. Similarly, African-Americans rated general health functioning and bodily pain as the most important predictors of their overall health. Consistent findings were obtained in the second study of 306 nonhospitalized Caucasians and 211 African-Americans.

Wierenga and Wuethrich (1995) described differences in health beliefs, characteristics, and attrition between Caucasian and African-American adults enrolled in a diabetes education research program. The sample consisted of 171 subjects (91 Caucasian, 80 African-American) with type 2 diabetes. Results revealed that African-Americans perceived more barriers for following a diet than did Caucasians. Caucasians reported less social support, more barriers to taking medication, and fewer barriers for exercise than did African-Americans. Attendance at previous educational programs
varied by racial group with 35% of Caucasians compared to 11.4% of African-Americans. The attrition rate was higher for African-Americans (33%) than Caucasians (10%) for reasons of health deterioration, research requirements, or lack of interest. Differences between Caucasians and African-Americans need to be recognized during the provision of health care services.

Maillet, D'Eramo-Melkus, and Spollett (1996) examined the health beliefs, self-care practices, weight-loss issues, diabetes education needs, and facilitators and barriers to diabetes health care in African-American women. The sample consisted of 34 subjects with type 2 diabetes or at risk for type 2 diabetes. The major findings revealed that the subjects were motivated to prevent diabetes-related complications but had not received support from their providers (e.g., many experienced lack of provider empathy and had a lack of knowledge about screening for complications and weight-loss goals). Family support strongly influenced how the subjects managed their type 2 diabetes.

There is a significant disparity in the quality of health care between Caucasians and African-Americans. African-Americans have a higher prevalence of chronic conditions such as type 2 diabetes. The disparity experienced by African-Americans may be related to behavior and magnified by inadequate health care. Literature indicates that African-Americans are less likely to have routine medical procedures and receive a lower quality of care than Caucasians. Further research is needed to: (1) better understand these disparity issues; and (2) determine if behavioral changes and improvement in health care will decrease these disparities.
Researchers suggest that health beliefs and expectations differ by race. African-Americans tend to view their health more positively than Caucasians. Both Caucasians and African-Americans perceive general health functioning as the most important predictor of overall health. Caucasians and African-Americans report different barriers for adherence to the diabetes regimen. The literature indicates that African-Americans have more financial, visual, and pain barriers to self-care than Caucasians. A better understanding of these barriers may help to: (1) enhance the lives of African-Americans with type 2 diabetes; and (2) narrow the disparities between these two racial groups.

Summary

Diabetes remains a major health concern in the United States. Despite medical advances and educational intervention, Caucasians and African-Americans continue to experience diabetes-related complications. African-Americans are more likely to suffer from diabetes-related complications and experience a higher diabetes-related mortality rate than some other racial groups. Perhaps psychosocial variables contribute to the development of diabetes-related complications experienced by Caucasians and African-Americans. Thus, there is a definite need to better understand the relationships of psychosocial variables to self-care behaviors and glycemic control in Caucasians and African-Americans to enhance the health of these two racial groups.

Researchers suggest that psychosocial variables (social support, self-efficacy, and outcome expectations) may be predictors of self-care behaviors and glycemic control of individuals with type 2 diabetes. However, most studies have explored the relationships among these variables in Caucasian individuals and few have considered these
relationships in the African-American population. Further, there are few studies that have compared these relationships between the two racial groups.

Since African-Americans have a higher prevalence of diabetes and report more barriers to self-care than Caucasians, there is a definite need to better understand the relationships of social support, self-efficacy, and outcome expectations to self-care behaviors and glycemic control in African-Americans. This study examined the relationships of these variables in Caucasian and African-American adults with type 2 diabetes. An understanding of these relationships will assist individuals in meeting the health care needs of these two racial groups. Medical treatment may need to be race-specific to adequately meet the health care needs of Caucasians and African-Americans with type 2 diabetes.
CHAPTER 4

RESEARCH METHODS

In this chapter, the research methods utilized in this study are discussed. The chapter is divided into six sections. The first section of this chapter explains the design of the study. The study sample is discussed in the second section of this chapter. In the third section of this chapter, the data collection procedures are explained. A description of the data collection sites is included in the fourth section of this chapter. In the fifth section of this chapter, the instruments utilized in this study are discussed. This chapter closes with a description of the statistical analyses used to test the hypotheses.

Study Design

A two-group, comparative, descriptive design (Cook & Campbell, 1963) was used in the study. All subjects completed four self-report measures: SSQ, SEQ, OEQ, and The Diabetes Activities Questionnaire (TDAQ). Long-term glycemic control was assessed by glycosylated hemoglobin analyses.
Sample

The convenience sample consisted of 91 adult subjects (64 Caucasian, 27 African-American) with type 2 diabetes registered for outpatient visits at one of three clinical agencies. The inclusion criteria for subject selection were: (1) diagnosed with type 2 diabetes; (2) over 18 years of age; and (3) registered for an outpatient clinic visit or an educational session. With an alpha of .05 and sample sizes of 64 and 27 in the Caucasian and African-American groups respectively, the power of the two-sample t-test to detect group differences was at least 80% if the ratio of the difference in means to the standard deviation was at least .65 (Elashof, 2000). This effect size of .65 was exactly midway between 'medium' (effect size = .5) and 'large' effect size of .8 (Cohen, 1988).

Procedures

The protocol was reviewed and approved by the Behavioral and Social Sciences Human Subjects Institutional Review Board at The Ohio State University (see Appendix A). In order to recruit subjects at additional sites, the protocol was later reviewed and approved by the Institutional Review Board at the University of Kentucky (see Appendix B). Subject recruitment took place at three sites: (1) Site A (subjects register for two all-day educational sessions); (2) Site B (subjects register for an outpatient clinic visit); and (3) Site C (subjects register for an outpatient educational session).

As shown in Appendix C, approval was granted for data collection at Site A. For subjects registering at this site, the organization’s secretary read a script (see Appendix D) to obtain informed consent for mailing of the letter and consent form. After this initial consent was obtained, each potential subject received: (1) a phone call from the principle.
investigator (PI) or her authorized representative; and (2) a letter from the PI explaining
the purpose and nature of the study (see Appendix E). Each subject was asked to sign the
consent form (see Appendix F) and return it in the self-addressed envelope. Once consent
was obtained, the PI mailed packets to participating subjects that contained the SSQ (see
Appendix G), SEQ (see Appendix H), OEQ (see Appendix I), TDAQ (see Appendix J),
and a self-addressed envelope. Each subject was asked to return completed
questionnaires in the self-addressed envelope prior to the first class session. Also, a
glycosylated hemoglobin assay was obtained from the subject’s medical record.
Confidentiality was assured by assigning code numbers to the subjects’ questionnaires.
Follow-up phone calls were made (if necessary) to maximize the return rate. Each
subject was sent a thank-you letter (see Appendix K) and a $5 gift certificate in
appreciation for his/her time and effort.

As shown in Appendix L, approval was granted for data collection at Site B. For
subjects registering for outpatient clinic visits at this site, the PI or her authorized
representative briefly explained the purpose of the study at the time of registration. Each
subject was asked to sign the consent form (see Appendix M) and given a letter
explaining the purpose and nature of the study (see Appendix E). Once consent was
obtained, each subject was asked to complete the SSQ (see Appendix G), SEQ (see
Appendix H), OEQ (see Appendix I), and TDAQ (see Appendix J) at the time of the
outpatient clinic visit. In addition, each subject was asked to complete a W-9 form (see
Appendix N) and a general information form (see Appendix O) in order to receive a
$5.00 check in appreciation for his/her time and effort. Each subject was given a thank-
you letter (see Appendix K) in appreciation for his/her time and effort. If subjects were unable to complete all of questionnaires and forms at the time of their visits, they were given the option of returning the completed questionnaires and forms in self-addressed envelopes. A glycosylated hemoglobin assay was obtained during this visit. Confidentiality was assured by assigning code numbers to the subjects’ questionnaires.

As shown in Appendix P, approval was granted for data collection at Site C. For subjects registering for outpatient educational sessions at this site, the PI briefly explained the purpose of the study after subjects registered for the session. Each subject was asked to sign the consent form (see Appendix Q) and given a letter explaining the purpose and nature of the study (see Appendix E). Once consent was obtained, each subject was asked to complete the SSQ (see Appendix G), SEQ (see Appendix H), OEQ (see Appendix I), and TDAQ (see Appendix J). In addition, each subject was asked to complete a W-9 form (see Appendix N) and a general information form (see Appendix O) in order to receive a $5.00 check in appreciation for his/her time and effort. If subjects were unable to complete all of the questionnaires and forms at the time of their visits, they were given the option of returning the completed questionnaires and forms in self-addressed envelopes. A glycosylated hemoglobin assay was obtained from each subject’s medical record. Confidentiality was assured by assigning code numbers to the subjects’ questionnaires.

In this study, the recruitment processes were different at the data collection sites. At Site A, the PI was unable to be on the premises at the time of subject recruitment. Thus, a script was developed to obtain initial subject consent for the PI or her authorized
representative to call each subject requesting permission to mail questionnaires. At Sites B and C, however, the PI or her authorized representative were on site and able to actively recruit subjects at the time of their clinic visits. Regardless of the recruitment process, the same data were collected from all subjects.

Description of Sites

Three different sites were used for data collection to maximize the number of subjects for the study. At Site A, all subjects attended two all-day sessions taught for two consecutive days by a multidisciplinary health care team (a registered nurse, clinical dietitian, physician, psychologist, and exercise physiologist). As shown in Appendix R, sessions included a didactic component focusing on diabetes-related topics such as a diet, medications, exercise, hygienic care, and prevention and detection of chronic complications. Additional instruction was provided in the form of literature that subjects took home to review. The sessions were taught each month at three different sites in the community. An average of 10 subjects participated in each class session. Support persons were welcome to attend the sessions.

At Site B, subjects were scheduled for outpatient clinic visits. Subjects were evaluated and treated by a physician and a registered nurse and/or a clinical dietitian. Literature was given to subjects (as appropriate) to enhance their understanding of diabetes management. During the visit, a glycosylated hemoglobin level was obtained to monitor glycemic control. Support persons were often present at the time of the visit.

Subjects were scheduled for outpatient educational sessions at Site C. Each subject was given the opportunity to learn about diabetes management while dialoguing with a
registered nurse and/or a clinical dietitian. Literature was given to subjects (as appropriate) to enhance their understanding of diabetes management. Support persons were often present at the time of the session.

**Instrumentation**

**Social Support Questionnaire**

Different conceptualizations of social support commonly include two elements: (1) the perception that there is a sufficient number of individuals to whom one can turn in times of need; and (2) a degree of satisfaction with the available support (Sarason, Levine, Basham, and Sarason, 1983). The SSQ developed by Sarason et al. (1983) includes these two elements (see Appendix G). An individual’s personality may affect the relationship between these two elements (Sarason et al., 1983). For example, some persons may believe that a large number of available support individuals are necessary, whereas, others may believe that one individual is adequate. Similarly, personality factors (e.g., self-esteem and feeling of environmental control) may affect individuals’ satisfaction with the support perceived to be available (Sarason et al., 1983).

Author permission was obtained to use the SSQ in the study (see Appendix S). As shown in Appendix G, the SSQ is a 27 two-part item instrument that measures the: (1) number of social support individuals; and (2) subjects' satisfaction with these individuals (Sarason et al., 1983). Each item asks subjects to: (1) list the individuals to whom they can rely on in specific situations; and (2) how satisfied they are with these support systems. For example, subjects answer questions such as, "Whom do you really count
on to be dependable when you need help?" and "Whom can you really count on to listen to you when you need help?"

Alpha coefficients for number scores and satisfaction scores were .97 and .94 respectively. The 4-week test/retest reliabilities for number scores and satisfaction scores were .90 and .83 respectively (Sarason et al., 1983). Through a series of empirical studies and employing the SSQ, Sarason et al. (1983) found that: (1) positive life events may be related to the number of social supports; (2) men and women with low social support are significantly less happy and more introverted than individuals with high social support; and (3) high social support positively affects individuals’ persistence at a task under frustrating conditions. In the study, subjects rated each SSQ item by indicating the number of support persons (N) and their satisfaction with the available social support (S) (maximum 162). Support satisfaction was rated on a scale from 1 (very dissatisfied) to 6 (very satisfied). The sum of N or S scores was divided by 27 (number of items) to determine the overall N and S scores. High N scores reflect high perceived availability of social support persons. High S scores reflect high satisfaction with the available social support system (Sarason et al., 1983). Cronbach’s alpha coefficients in this study were .97 for number scores and .98 for satisfaction scores.

*Self-Efficacy Questionnaire*

According to Bandura (1977), an efficacy expectation was defined as, “...the conviction that one can successfully execute the behavior to produce the outcomes” (p. 193). This operational definition provided the framework for the development of the
SEQ. The SEQ items were drawn from Bandura's (1977, 1982) work on Social Cognitive Theory.

Author permission was obtained to use the SEQ in the study (see Appendix T). As shown in Appendix U, the original SEQ is a 29-item instrument that measures subjects' confidence in their abilities to perform a graded series of regimen behaviors (e.g., test sugar level at least once a day, test sugar level at least twice a day) in four regime areas: glucose testing (8 items), exercise (8 items), eating habits (9 items), and medication taking (4 items) (Glasgow et al., 1989). For example, subjects rate their perceived ability to perform a behavior such as "I could test my glucose levels regularly when I'm at home."

Skelly et al. (1995) demonstrated a Cronbach's alpha of .92 and a 2-week test/retest reliability of .95 for this instrument. Kingery and Glasgow's (1989) data supported the SEQ's stability of expectation measures with 6-month test/retest correlation coefficients. Glucose testing self-efficacy was the lowest (r=.35) and all other items had correlation coefficients between .44 and .54. The SEQ was examined for face validity by a panel of experts familiar with diabetes and the population to be studied (Skelly et al., 1995).

Subjects rate each SEQ item according to their perceived ability to perform the behavior (-100 completely certain that I could not to +100 completely certain that I could). The SEQ scores are recoded into 10-unit intervals with negative scores eliminated (-100.00 to 9.99=1, 10.00 to 19.99=2, 20.00 to 29.99=3, 30.00 to 39.99=4, etc.) (Kingery & Glasgow, 1989). A subscale score is produced for each of the four
regimen areas. The total self-efficacy score is a summation of the four subscale mean scores (Skelly et al., 1995).

Author permission was obtained to modify the SEQ for use in the study (see Appendix T). See Appendix H for the slightly modified SEQ. Items were rewritten using simpler terminology to make completion easier for participating subjects. For example, the word “physician” was changed to “doctor” and the word “glucose” was changed to “sugar”. Also, the scaling of the instrument was modified to simplify the scoring of the instrument. Subjects rated each SEQ item according to their perceived ability to perform the behavior on a scale from 1 (strongly disagree) to 4 (strongly agree) (to simplify the scaling procedure). A subscale score was produced for each of the four regimen areas: (1) glucose testing (SE sugar testing); (2) exercise (SE exercise); (3) eating habits (SE eating habits); (4) medication-taking (SE medication-taking). The total self-efficacy score (SE overall score) was a summation of the four subscale scores (maximum 116). A high subscale score reflects high-perceived ability to perform diabetes-related behaviors in a specific regime area. Similarly, the total self-efficacy score reflects high-perceived ability to perform diabetes-related behaviors. In this study, Cronbach’s alpha coefficients for the SE subscales ranged from .83 to .92. The alpha coefficient for the overall SE score in this study was .92.

*Outcome Expectancy Questionnaire*

According to Bandura (1977), an outcome expectation was defined as, “…a person’s estimate that a given behavior will lead to certain outcomes” (p. 193). This
operational definition provided the framework for the development of the OEQ. The OEQ items were drawn from Bandura’s (1977, 1982) work on Social Cognitive Theory.

Author permission was obtained to use the OEQ in the study (see Appendix T). As shown in Appendix V, the original OEQ is a 20-item instrument that measures subjects’ beliefs that certain behaviors will lead to specific outcomes (Glasgow et al., 1989). For example, subjects rate their belief in regards to statements such as "Exercising regularly will make me feel healthier." For each item, subjects choose a response from 0 (totally disagree) to 100 (totally agree) that best represents their beliefs. Ten of the OEQ items are expressed in positive terms and 10 are expressed in negative terms. An overall score is determined by subtracting the negative scores from 100, adding the result to the positive scores, and calculating an average (Skelly et al., 1995).

Skelly et al. (1995) found the Cronbach's alpha for this instrument to be .50 with a test/retest reliability of .93 for a two-week period. The instrument was examined for face validity (Skelly et al., 1995).

Author permission was obtained to modify the OEQ for use in the study (see Appendix T). See Appendix I for the slightly modified OEQ. Items were rewritten in simpler terms to make completion easier for participating subjects. For example, the word "glucose" was changed to "sugar" and the word "adhering" was changed to "doing". Items were placed into five regime areas: OE sugar testing (4 items); OE exercise (4 items); OE eating habits (4 items); OE medication-taking (4 items); and OE self-care activities (4 items) to measure beliefs specific to each regimen area. Also, the scaling of the instrument was modified to simplify the scoring of the instrument. For each item,
subjects chose a response from 1 (strongly disagree) to 4 (strongly agree) (to simplify the scaling procedure). Negatively expressed items were reverse scored. A subscale score was determined for each of the five regimen areas. The total OEQ score (OE score) was a summation of the five subscale scores (maximum 80). A high subscale score reflects strong beliefs that diabetes-related behaviors pertaining to a regime area will lead to specific outcomes. A high OEQ total score reflects strong beliefs that diabetes-related behaviors will lead to specific outcomes. The Cronbach’s coefficient alpha for the OE score in this study was .80.

*The Diabetes Activities Questionnaire*

In the development of TDAQ, Hernandez (1997) defined adherence as “the extent to which behavior complies with the prescription (diabetes regimen) provided by members of the health team” (p. 204). TDAQ can be used by clinicians and researchers to measure subject adherence to the diabetes regimen (Hernandez, 1997).

Author permission was obtained to use TDAQ in the study (see Appendix W). As shown in Appendix X, the original TDAQ is a 13-item instrument which measures subjects’ adherence to the diabetes regimen using two subscales: Lifestyle/Monitoring (8 items) and Treatment (5 items) (Hernandez, 1997). For example, subjects respond to statements such as "I test my blood sugar as often as suggested by my educator."

Subjects completed TDAQ on two separate occasions (7 to 10 days apart) with analyses revealing a Pearson Product Moment Correlation of .78 for this instrument (Hernandez, 1997). Hernandez (1997) demonstrated a Cronbach's alpha of .82 for TDAQ as a whole, .72 for the Treatment subscale, and .81 for the Lifestyle/Monitoring subscale.
indicating internal consistency of the instrument. Content validity of TDAQ was strengthened by the researcher’s personal diabetes education experience, a complete literature review, and the use of content experts to review the instrument for item consistency and clarity. The factor analysis identified two factors: (1) changes in client lifestyle (factor one); and (2) necessary treatments for diabetes (factor two) with adherence consisting of more than one dimension (Hernandez, 1997).

Subjects respond to each of TDAQ items using a visual analog scale 100 millimeters in length with anchors at both ends ("never" being the left anchor and "always" being the right anchor). A score is determined for each item by measuring (in millimeters) from the left anchor to the response made by the subject. A total summative score is calculated for TDAQ ranging from 0 to 1,300. Total summative subscale scores range from 0 to 700 for the Lifestyle/Monitoring subscale (items 1, 2, 3, 4, 5, 9, 10) and 0 to 400 for the Treatment subscale (items 6, 7, 8, 12). A higher score reflects greater adherence to the diabetes regimen.

Author permission was obtained to modify TDAQ for use in the study (see Appendix W). See Appendix J for the slightly modified TDAQ. For each item, subjects chose a response from 1 (not applicable) to 4 (always). A total TDAQ score (TDAQ score) was a summation of the 13-item scores (maximum 52). A higher score reflects greater adherence to the diabetes regime. The Cronbach’s coefficient alpha for TDAQ score in this study was .84.
Glycosylated Hemoglobin Assay Testing

Glycohemoglobin is blood glucose bound to hemoglobin. The glycosylated hemoglobin assay (HbA₁c) measures the percentage of total hemoglobin bound by glucose (Fischbach, 2000). Since red blood cells have a lifespan of approximately 120 days, the HbA₁c is a reliable indicator of the average serum glucose level over a 120-day period (Chlebowy & Wagner, 2001; Fishbach, 2000). The ideal range for HbA₁c is 4.8% to 7.8% (Fischbach, 2000). A high value indicates poor glucose control for the past 120 days. A value falling within the ideal range indicates adequate glucose control over the past 120 days. Uncontrolled diabetes is present if the HbA₁c level is greater than 15% (Chlebowy & Wagner, 2001).

A 3-ml venous blood sample is necessary in order to obtain the HbA₁c assay (Fishbach, 2000). The assay can be obtained in a non-fasting state. Values are frequently increased in individuals with: (1) poorly controlled diabetes or newly diagnosed diabetes; (2) iron-deficiency anemia; and/or (3) alcohol or lead toxicity. Values are frequently decreased in individuals with: (1) chronic blood loss; (2) chronic renal failure; (3) and/or hemolytic anemia (Fishbach, 2000).

At Sites A and C, the HbA₁c values (within the last 4 months) were obtained from the subjects’ medical records. At Site B, the HbA₁c value for each subject was obtained at the time of the outpatient clinic visit.

Demographic Data and Information

Demographic data and diabetes-related information were obtained differently at each of the sites. At Site A, an assessment questionnaire was completed during each
subject's initial consultation with the diabetes nurse educator or clinical dietitian (see Appendix Y). This questionnaire provided demographic information (e.g., age, sex, race, marital status, educational level, occupational status, and date of initial diagnosis of diabetes) and information regarding each subject's physical activity, medications, insulin reactions, diabetes control, blood glucose monitoring activities, and social and emotional concerns.

At Site B, each subject completed an assessment questionnaire at the time of his/her initial outpatient clinic visit (see Appendix Z). This questionnaire provided demographic information (e.g., age, sex, marital status, educational level, occupational status, and date of initial diagnosis of diabetes) and medical history information. Information regarding each subject's activity level, medications, diabetes control, and blood glucose monitoring activities was found in the medical record (see Appendix AA).

At Site C, demographic information (e.g., age, sex, race, marital status, educational level, occupational status, and date of initial diagnosis of diabetes) was found in the medical record. The nurse educator or clinical dietitian documented information regarding each subject's activity level, medications, diabetes control, blood glucose monitoring activities, and family support in the nursing note section of the medical record.

Data Analysis

Data were analyzed using the Statistical Application System (SAS) 8.1. Descriptive statistics such as means, standard deviations, and frequency distributions (as appropriate to the level of measurement) were used to summarize the demographic data.
Two-sample t-tests and chi-square analyses were used to test for differences in demographic and diabetes characteristics between the two racial groups. Pearson product-moment correlations were used to determine whether significant relationships exist between scores on the SSQ, SEQ, and OEQ, and TDAQ and glycosylated hemoglobin values (Hypotheses #1-#6). Two-sample t-tests were used to detect differences in scores on the self-report measures and glycosylated hemoglobin values between the two racial groups (Hypothesis #7). Cronbach’s alphas were used to determine the internal consistency of the SSQ, SEQ, OEQ, and TDAQ.
CHAPTER 5

RESULTS

This chapter presents the results of the study. The first section of this chapter describes demographic and diabetes characteristics of the study sample. The results for each of the hypotheses are discussed in the following sections of this chapter.

Description of the Sample

Among the 91 subjects in the study, 64 (70%) were Caucasian and 27 (30%) were African-American (see Table 5.1). The sample was composed of 51 women and 40 men ranging in age from 19 to 83, with a mean of 55 years ($\overline{SD} = 12.51$). The majority of subjects were married (65%), and 36% were employed. The sample was well educated, with over 48.3% having some college or technical school experience, although 17% had some high school education or less. In terms of diabetes characteristics, the duration of diabetes ranged from four weeks to 28 years, with a mean of seven years ($\overline{SD} = 6.48$). The majority of subjects (60%) reported taking oral agents for diabetes management with 21% taking oral agents and insulin. Glycosylated hemoglobin levels ranged from 5% to 16%, with a mean of 8% ($\overline{SD} = .02$).
In further analysis of the study sample, analyses were conducted to test for differences in demographic and diabetes characteristics between the two racial groups. Two-sample t-tests revealed no significant differences in regards to age (\( p = .81 \)), duration of diabetes (\( p = .69 \)), and glycosylated hemoglobin (\( p = .85 \)) (see Table 5.2). As shown in Table 5.1, the mean age for Caucasians was 54.8 years (\( SD = 11.66 \)) with a similar mean of 55.4 years (\( SD = 14.57 \)) for African-Americans. In terms of diabetes characteristics, the mean duration of diabetes for Caucasians was 7.3 years (\( SD = 6.41 \)) with a mean of 6.6 years (\( SD = 6.75 \)) for African-Americans. The mean glycosylated hemoglobin level for Caucasians was 8.2% (\( SD = 0.02 \)) with a similar mean of 8.1% (\( SD = 0.02 \)) for African-Americans.

Analyses were further conducted to test for differences in demographic characteristics between the two racial groups. As shown in Table 5.2, chi-square analyses revealed two significant differences between the two racial groups. A significant difference was found in regards to sex (\( p = .04 \)). Seventy-four percent of the African-American sample was female while only 48.4% of Caucasians were female. A significant difference was also found in regards to marital status (\( p < .0001 \)). Thirty-two percent of the African-American sample was married contrasting to 70.3% of Caucasians who were married. No significant differences were found in regards to education (\( p = .37 \)), occupation (\( p = .20 \)), and medication management (\( p = .57 \)).

Relationship between Social Support and Self-Care Behaviors

The first hypothesis inquired about the relationship between social support and self-care behaviors in all subjects, Caucasians, and African-Americans. A Pearson
Product Moment Correlation was computed between: (1) number of social support persons (SSQ N score) and self-care behaviors; and (2) satisfaction with social support persons (SSQ S score) and self-care behaviors for all subjects, Caucasians, and African-Americans.

When the group was considered in total, analyses revealed no significant relationships between: (1) SSQ N score and self-care behaviors; and (2) SSQ S score and self-care behaviors. As shown in Table 5.3, the relationship between SSQ N and self-care behaviors was not significant \( (r = .13, p = .25) \). The relationship between SSQ S and self-care behaviors was also not significant \( (r = .12, p = .26) \).

For Caucasians, the SSQ N and SSQ S scores were not significantly related to self-care behaviors. As shown in Table 5.3, the relationship between SSQ N and self-care behaviors was not significant \( (r = .12, p = .37) \). The relationship between SSQ S and self-care behaviors was also not significant \( (r = .05, p = .67) \).

Analyses revealed no significant relationships between SSQ N and SSQ S scores and self-care behaviors for African-Americans (see Table 5.3). The relationship between SSQ N and self-care behaviors was not significant \( (r = .13, p = .54) \). The relationship between SSQ S and self-care behaviors was also not significant \( (r = .17, p = .41) \). Since social support was not significantly related to self-care behaviors in the total group, Caucasians, and African-Americans, hypothesis 1 was not supported.

**Relationship between Self-Efficacy and Self-Care Behaviors**

The second hypothesis inquired about the relationship between self-efficacy and self-care behaviors in all subjects, Caucasians, and African-Americans. A Pearson
Product Moment Correlation was computed between: (1) SE sugar testing and self-care behaviors; (2) SE exercise and self-care behaviors; (3) SE eating habits and self-care behaviors; (4) SE medication-taking and self-care behaviors; and (5) overall SE score and self-care behaviors for all subjects, Caucasians, and African-Americans.

Analyses revealed no significant relationships between self-efficacy and self-care behaviors when the group was considered in total (see Table 5.4). The relationship between SE sugar testing and self-care behaviors was not significant ($r = .07, p = .54$). The relationship between SE exercise and self-care behaviors was weak and not significant ($r = -.03, p = .80$). No significant relationship was found between SE eating habits and self-care behaviors ($r = .10, p = .33$). The relationship between SE medication-taking and self-care behaviors was not significant ($r = .13, p = .23$). The overall SE score was not significantly related to self-care behaviors ($r = .09, p = .40$).

For Caucasians, analyses revealed no significant relationships between self-efficacy and self-care behaviors (see Table 5.4). SE sugar testing was not significantly related to self-care behaviors ($r = .04, p = .78$). The relationship between SE exercise and self-care behaviors was not significant ($r = -.05, p = .70$). The relationship between SE eating habits and self-care behaviors was also not significant ($r = .15, p = .24$). SE medication-taking was not significantly related to self-care behaviors ($r = .09, p = .47$). The overall SE score was not significantly related to self-care behaviors ($r = .06, p = .63$).

Analyses revealed no significant relationships between self-efficacy and self-care behaviors for African-Americans. As shown in Table 5.4, SE sugar testing was not significantly related to self-care behaviors ($r = .01, p = .64$). The relationship between SE
exercise and self-care behaviors was not significant \(r = .02, p = .91\). The relationship between SE eating habits and self-care behaviors was not significant \(r = -.02, p = .94\). SE medication-taking was not significantly related to self-care behaviors \(r = .24, p = .23\). The relationship between the SE overall score and self-care behaviors was weak and not significant \(r = .13, p = .52\). Since self-efficacy was not significantly related to self-care behaviors in the total group, Caucasians, and African-Americans, hypothesis 2 was not supported.

Relationship between Outcome Expectations and Self-Care Behaviors

The third hypothesis studied the relationship between outcome expectations and self-care behaviors in all subjects, Caucasians, and African-Americans. A Pearson Product Moment Correlation was computed between OE scores and self-care behaviors for all subjects, Caucasians, and African-Americans.

When the group was considered in total, analyses revealed a significant relationship between outcome expectations and self-care behaviors. As shown in Table 5.5, the OE score was significantly correlated with self-care behaviors \(r = .27, p = .01\).

For Caucasians, analyses revealed no significant relationships between outcome expectations and self-care behaviors. As shown in Table 5.5, the relationship between OE score and self-care behaviors was not significant \(r = .24, p = .06\).

As shown in Table 5.5, analyses revealed a significant relationship between outcome expectations and self-care behaviors for African-Americans \(r = .43, p = .03\). Although significant relationships were found between outcome expectancy and self-care
behaviors for the total group and African-Americans, an insignificant relationship was revealed for Caucasians. Therefore, hypothesis 3 was not fully supported.

**Relationship between Social Support and Glycemic Control**

The fourth hypothesis inquired about the relationship between social support and glycemic control in all subjects, Caucasians, and African-Americans. A Pearson Product Moment Correlation was computed between: (1) number of social support persons (SSQ N score) and glycemic control; and (2) satisfaction with social support persons (SSQ S score) and glycemic control for all subjects, Caucasians, and African-Americans.

When the group was considered in total, analyses revealed no significant relationships between: (1) SSQ N score and glycemic control; and (2) SSQ S score and glycemic control. As shown in Table 5.6, the relationship between SSQ N and glycemic control was weak and not significant ($r = -.07, p = .51$). The relationship between SSQ S and glycemic control was also weak and not significant ($r = -.11, p = .32$).

For Caucasians, no significant relationships were found between the SSQ N and SSQ S scores and glycemic control. As shown in Table 5.6, the relationship between SSQ N and glycemic control was not significant ($r = -.002, p = .99$). Similarly, the relationship between SSQ S and glycemic control was weak and not significant ($r = -.19, p = .14$).

Analyses revealed no significant relationships between the SSQ N and SSQ S scores and glycemic control for African-Americans. As shown in Table 5.6, SSQ N was not significantly related to glycemic control ($r = -.22, p = .29$). The relationship between SSQ S and glycemic control was weak and not significant ($r = -.04, p = .83$). Since no
significant relationships were found between social support and glycemic control in the
total group, Caucasians, and African-Americans, hypothesis 4 was not supported.

**Relationship between Self-Efficacy and Glycemic Control**

The fifth hypothesis inquired about the relationship between self-efficacy and
glycemic control in all subjects, Caucasians, and African-Americans. A Pearson Product
Moment Correlation was computed between: (1) SE sugar testing and glycemic control;
(2) SE exercise and glycemic control; (3) SE eating habits and glycemic control; (4) SE
medication-taking and glycemic control; and (5) overall SE score and glycemic control
for all subjects, Caucasians, and African-Americans.

When the group was considered in total, no significant relationships were found
between self-efficacy and glycemic control (see Table 5.7). SE sugar testing was not
significantly related to glycemic control \( r = .04, p = .73 \). The relationship between SE
exercise and glycemic control was not significant \( r = -.13, p = .23 \). SE eating habits
were not significantly related to glycemic control \( r = -.03, p = .76 \). The relationship
between SE medication-taking and glycemic control was weak and not significant \( r =
.05, p = .66 \). SE overall score was not significantly related to glycemic control \( r = -.03,
p = .82 \).

As shown in Table 5.7, analyses revealed no significant relationships between
self-efficacy and glycemic control for Caucasians. The relationship between SE sugar
testing and glycemic control was not significant \( r = .21, p = .10 \). The relationship
between SE exercise and glycemic control was weak and not significant \( r = -.09, p =
.50 \). SE eating habits were not significantly related to glycemic control \( r = .01, p = .96 \).
The relationship between SE medication-taking and glycemic control was not significant \((r = .10, p = .43)\). SE overall score was not significantly related to glycemic control \((r = .07, p = .59)\).

Analyses revealed no significant relationships between self-efficacy and glycemic control for African-Americans (see Table 5.7). The relationship between SE sugar testing and glycemic control was weak and not significant \((r = -.33, p = .09)\). No significant relationship was found between SE exercise and glycemic control \((r = -.24, p = .22)\). The relationship between SE eating habits and glycemic control was not significant \((r = -.14, p = .48)\). The relationship between SE medication-taking and glycemic control was weak and not significant \((r = -.16, p = .43)\). SE overall score was not significantly related to glycemic control \((r = -.28, p = .15)\). Since no significant relationships were found between self-efficacy and glycemic control in the total group, Caucasians, and African-Americans, hypothesis 5 was not supported.

Relationship between Outcome Expectations and Glycemic Control

Hypothesis 6 studied the relationship between outcome expectations and glycemic control in all subjects, Caucasians, and African-Americans. A Pearson Product Moment Correlation was computed between OE score and glycemic control. When the group was considered in total, analyses revealed an insignificant relationship between outcome expectations and glycemic control (see Table 5.8) \((r = -.05, p = .67)\). As shown in Table 5.8, analyses revealed an insignificant relationship between outcome expectations and glycemic control for Caucasians \((r = -.01, p = .96)\). For African-Americans, an insignificant relationship was found between outcome expectations and glycemic control
(see Table 5.8) \( r = -.24, p = .24 \). Since no significant relationships were found between outcome expectancy and glycemic control in the total group, Caucasians, and African-Americans, hypothesis 6 was not supported.

Differences in Variables According to Race

Hypothesis 7 inquired about the difference in study variables between Caucasian and African-American subjects. As shown in Tables 5.9 to 5.12, mean values and standard deviations were computed for each of the variables for each racial group.

Analyses revealed means and standard deviations for social support: (1) SSQ N score \( (M = 2.70, SD = 1.58 \) for Caucasians; \( M = 2.35, SD = 2.14 \) for African-Americans); and (2) SSQ S score \( (M = 5.44, SD = 0.87 \) for Caucasians; \( M = 4.65, SD = 1.86 \) for African-Americans) (see Table 5.9).

As shown in Table 5.10, means and standard deviations were computed for self-efficacy for both racial groups: (1) SE sugar testing \( (M = 27.83, SD = 4.87 \) for Caucasians; \( M = 25.96, SD = 6.16 \) for African-Americans); (2) SE exercise \( (M = 24.69, SD = 4.42 \) for Caucasians; \( M = 24.41, SD = 4.13 \) for African-Americans); (3) SE eating habits \( (M = 29.33, SD = 4.25 \) for Caucasians; \( M = 28.52, SD = 4.43 \) for African-Americans); (4) SE medication-taking \( (M = 14.05, SD = 2.55 \) for Caucasians; \( M = 13.73, SD = 1.82 \) for African-Americans); and (5) SE overall score \( (M = 95.95, SD = 11.94 \) for Caucasians; \( M = 92.15, SD = 12.36 \) for African-Americans).

As shown in Table 5.11, means and standard deviations were computed for outcome expectations for both racial groups. Analyses revealed an OE score \( (M = 61.68, SD = 7.47 \) for Caucasians; \( M = 61.81, SD = 4.28 \) for African-Americans).
Means and standard deviations were computed for self-care behaviors and glycemic control for both racial groups (see Table 5.12). For Caucasians, the mean for self-care behaviors was 37.77 (SD = 9.16) with a similar mean of 36.59 (SD = 9.46) for African-Americans. For Caucasians, the mean for glycemic control was 8.2% (SD = 0.02) with a similar mean of 8.1% (SD = 0.02) for African-Americans.

Two-sample t-tests revealed one significant difference in the variables between the two races (see Tables 5.9 to 5.12). As shown in Table 5.9, no significant difference was found in the SSQ number score (p = .40). However, the SSQ satisfaction score was significant (p = .05). Caucasians reported significantly greater satisfaction with social support than African-Americans.

Analyses revealed no significant differences in SE sugar testing (p = .13), SE exercise (p = .78), SE eating habits (p = .41), SE medication-taking (p = .57), and SE overall score (p = 0.18) (see Table 5.10). As shown in Table 5.11, no significant difference was found in OE scores (p = .92) for Caucasians and African-Americans. No significant differences were found in self-care behaviors (p = .58) and glycosylated hemoglobin (p = .85) (see Table 5.12). Since SSQ number scores, social support, self-efficacy, outcome expectations, self-care behaviors, and glycemic control did not significantly differ by race of the subjects, hypothesis 7 was not fully supported.
<table>
<thead>
<tr>
<th>Characteristic</th>
<th>All subjects $(N = 91)$</th>
<th>Caucasians $(n = 64)$</th>
<th>African-Americans $(n = 27)$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$M$</td>
<td>54.96</td>
<td>54.75</td>
<td>55.44</td>
</tr>
<tr>
<td>$SD$</td>
<td>12.51</td>
<td>11.66</td>
<td>14.57</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$N$ (%) Male</td>
<td>40 (44.0)</td>
<td>33 (51.6)</td>
<td>7 (25.9)</td>
</tr>
<tr>
<td>$N$ (%) Female</td>
<td>51 (56.0)</td>
<td>31 (48.4)</td>
<td>20 (74.1)</td>
</tr>
<tr>
<td><strong>Marital Status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$N$ (%) Never married</td>
<td>11 (12.4)</td>
<td>5 (7.8)</td>
<td>6 (24.0)</td>
</tr>
<tr>
<td>$N$ (%) Married</td>
<td>58 (65.2)</td>
<td>50 (78.1)</td>
<td>8 (32.0)</td>
</tr>
<tr>
<td>$N$ (%) Separated/ Divorced</td>
<td>10 (11.2)</td>
<td>5 (7.8)</td>
<td>5 (20.0)</td>
</tr>
<tr>
<td>$N$ (%) Widowed</td>
<td>10 (11.2)</td>
<td>4 (6.3)</td>
<td>6 (24.9)</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$N$ (%) Less than 8\textsuperscript{th} grade</td>
<td>5 (5.8)</td>
<td>2 (3.3)</td>
<td>3 (11.1)</td>
</tr>
<tr>
<td>$N$ (%) Some high school</td>
<td>10 (11.5)</td>
<td>6 (10.0)</td>
<td>4 (14.8)</td>
</tr>
<tr>
<td>$N$ (%) High school graduate</td>
<td>30 (34.5)</td>
<td>19 (31.7)</td>
<td>11 (40.7)</td>
</tr>
<tr>
<td>$N$ (%) Some college or technical school</td>
<td>18 (20.7)</td>
<td>12 (20.0)</td>
<td>6 (22.2)</td>
</tr>
<tr>
<td>$N$ (%) College graduate</td>
<td>24 (27.6)</td>
<td>21 (35.0)</td>
<td>3 (11.1)</td>
</tr>
<tr>
<td>Characteristic</td>
<td>All subjects</td>
<td>Caucasians</td>
<td>African-Americans</td>
</tr>
<tr>
<td>--------------------------------------------</td>
<td>--------------</td>
<td>------------</td>
<td>------------------</td>
</tr>
<tr>
<td></td>
<td>(N = 91)</td>
<td>(n = 64)</td>
<td>(n = 27)</td>
</tr>
<tr>
<td><strong>Occupation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N (%) Employed</td>
<td>32 (36.0)</td>
<td>27 (42.9)</td>
<td>5 (19.2)</td>
</tr>
<tr>
<td>N (%) Homemaker</td>
<td>12 (13.5)</td>
<td>8 (12.7)</td>
<td>4 (15.4)</td>
</tr>
<tr>
<td>N (%) Disabled</td>
<td>14 (15.7)</td>
<td>9 (14.3)</td>
<td>5 (19.2)</td>
</tr>
<tr>
<td>N (%) Unemployed</td>
<td>12 (13.5)</td>
<td>7 (11.1)</td>
<td>5 (19.2)</td>
</tr>
<tr>
<td>N (%) Retired</td>
<td>19 (21.3)</td>
<td>12 (19.0)</td>
<td>7 (26.9)</td>
</tr>
<tr>
<td><strong>Duration of diabetes</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>7.08</td>
<td>7.26</td>
<td>6.65</td>
</tr>
<tr>
<td>SD</td>
<td>6.48</td>
<td>6.41</td>
<td>6.75</td>
</tr>
<tr>
<td><strong>Medications</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N (%) None</td>
<td>7 (7.7)</td>
<td>5 (7.8)</td>
<td>2 (7.4)</td>
</tr>
<tr>
<td>N (%) Oral agents</td>
<td>55 (60.4)</td>
<td>40 (62.5)</td>
<td>15 (55.6)</td>
</tr>
<tr>
<td>N (%) Oral agents and insulin</td>
<td>19 (20.9)</td>
<td>12 (18.8)</td>
<td>7 (25.9)</td>
</tr>
<tr>
<td>N (%) Insulin</td>
<td>10 (11.0)</td>
<td>7 (10.9)</td>
<td>3 (11.1)</td>
</tr>
<tr>
<td><strong>Glycosylated hemoglobin</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>8.0</td>
<td>8.2</td>
<td>8.1</td>
</tr>
<tr>
<td>SD</td>
<td>0.02</td>
<td>0.02</td>
<td>0.02</td>
</tr>
</tbody>
</table>

Table 5.1: Select demographic and diabetes characteristics of all subjects, Caucasians, and African-Americans.
<table>
<thead>
<tr>
<th>Characteristic</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>.8104</td>
</tr>
<tr>
<td>Gender</td>
<td>.0367 *</td>
</tr>
<tr>
<td>Marital status</td>
<td>.0001 **</td>
</tr>
<tr>
<td>Education</td>
<td>.3659</td>
</tr>
<tr>
<td>Occupation</td>
<td>.2011</td>
</tr>
<tr>
<td>Duration of diabetes</td>
<td>.6907</td>
</tr>
<tr>
<td>Medication management</td>
<td>.5722</td>
</tr>
<tr>
<td>Glycosylated hemoglobin</td>
<td>.8480</td>
</tr>
</tbody>
</table>

* $p \leq .05$  ** $p \leq .01$

Table 5.2: Differences in demographic and diabetes characteristics between races.
<table>
<thead>
<tr>
<th>Variable</th>
<th>All subjects ($N = 91$)</th>
<th>Caucasians ($n = 64$)</th>
<th>African-Americans ($n = 27$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSQ number</td>
<td>.1256</td>
<td>.1152</td>
<td>.1291</td>
</tr>
<tr>
<td>SSQ satisfaction</td>
<td>.1209</td>
<td>.0549</td>
<td>.1727</td>
</tr>
</tbody>
</table>

*Note.* SSQ = Social Support Questionnaire

* $p \leq .05$

Table 5.3: Pearson product-moment correlation coefficients for social support with self-care behaviors for all subjects, Caucasians, and African-Americans.
<table>
<thead>
<tr>
<th>Variable</th>
<th>All subjects (N = 91)</th>
<th>Caucasians (n = 64)</th>
<th>African-Americans (n = 27)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SE sugar testing</td>
<td>.0654</td>
<td>.0364</td>
<td>.0955</td>
</tr>
<tr>
<td>SE exercise</td>
<td>-.0267</td>
<td>-.0487</td>
<td>.0222</td>
</tr>
<tr>
<td>SE eating habits</td>
<td>.1032</td>
<td>.1495</td>
<td>-.0159</td>
</tr>
<tr>
<td>SE medication-taking</td>
<td>.1282</td>
<td>.0924</td>
<td>.2428</td>
</tr>
<tr>
<td>SE overall score</td>
<td>.0902</td>
<td>.0626</td>
<td>.1333</td>
</tr>
</tbody>
</table>

*Note. SE = Self-efficacy

*p ≤ .05

Table 5.4: Pearson product-moment correlation coefficients for self-efficacy with self-care behaviors for all subjects, Caucasians, and African-Americans.
<table>
<thead>
<tr>
<th>Variable</th>
<th>All subjects $(N = 91)$</th>
<th>Caucasians $(n = 64)$</th>
<th>African-Americans $(n = 27)$</th>
</tr>
</thead>
<tbody>
<tr>
<td>OE score</td>
<td>0.2675 **</td>
<td>0.2393</td>
<td>0.4276 *</td>
</tr>
</tbody>
</table>

Note. OE = Outcome expectancy

* $p \leq 0.05$  ** $p \leq 0.01$

Table 5.5: Pearson product-moment correlation coefficients for outcome expectations with self-care behaviors for all subjects, Caucasians, and African-Americans.
<table>
<thead>
<tr>
<th>Variable</th>
<th>All subjects (N = 91)</th>
<th>Caucasians (n = 64)</th>
<th>African-Americans (n = 27)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSQ number</td>
<td>- .0721</td>
<td>- .0021</td>
<td>- .2203</td>
</tr>
<tr>
<td>SSQ satisfaction</td>
<td>- .1010</td>
<td>- .1944</td>
<td>- .0447</td>
</tr>
</tbody>
</table>

*Note.* SSQ = Social Support Questionnaire

* * p ≤ .05

Table 5.6: Pearson product-moment correlation coefficients for social support with glycemic control for all subjects, Caucasians, and African-Americans.
<table>
<thead>
<tr>
<th>Variable</th>
<th>All subjects (N = 91)</th>
<th>Caucasians (n = 64)</th>
<th>African-Americans (n = 27)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SE sugar testing</td>
<td>.0372</td>
<td>.2134</td>
<td>-.3284</td>
</tr>
<tr>
<td>SE exercise</td>
<td>-.1285</td>
<td>-.0890</td>
<td>-.2426</td>
</tr>
<tr>
<td>SE eating habits</td>
<td>-.0327</td>
<td>.0065</td>
<td>-.1412</td>
</tr>
<tr>
<td>SE medication-taking</td>
<td>.0488</td>
<td>.1033</td>
<td>-.1613</td>
</tr>
<tr>
<td>SE overall score</td>
<td>-.0254</td>
<td>.0710</td>
<td>-.2874</td>
</tr>
</tbody>
</table>

*Note.* SE = Self-efficacy

* *p ≤ .05*

Table 5.7: Pearson product-moment correlation coefficients for self-efficacy with glycemic control for all subjects, Caucasians, and African-Americans.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Glycemic control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All subjects</td>
</tr>
<tr>
<td></td>
<td>(N = 91)</td>
</tr>
<tr>
<td>OE score</td>
<td>-.0466</td>
</tr>
</tbody>
</table>

*Note.* OE = Outcome expectancy

\* \(p \leq .05\)

Table 5.8: Pearson product-moment correlation coefficients for outcome expectations with glycemic control for all subjects, Caucasians, and African-Americans.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Caucasians ($n = 64$)</th>
<th>African-Americans ($n = 27$)</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSQ number</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M (SD)</td>
<td>2.7 (1.58)</td>
<td>2.3 (2.14)</td>
<td>.40</td>
</tr>
<tr>
<td>Obtained range</td>
<td>.6 - 6.8</td>
<td>0.0 - 8.8</td>
<td></td>
</tr>
<tr>
<td>SSQ satisfaction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M (SD)</td>
<td>5.4 (0.87)</td>
<td>4.6 (1.86)</td>
<td>.05 *</td>
</tr>
<tr>
<td>Possible range</td>
<td>0.0 - 6.0</td>
<td>0.0 - 6.0</td>
<td></td>
</tr>
<tr>
<td>Obtained range</td>
<td>1.4 - 6.0</td>
<td>0.4 - 6.0</td>
<td></td>
</tr>
</tbody>
</table>

*Note. SSQ = Social Support Questionnaire*

* $p \leq .05$

Table 5.9: Differences in social support variables based on race.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Caucasians (n = 64)</th>
<th>African-Americans (n = 27)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>SE sugar testing</td>
<td></td>
<td></td>
<td>.13</td>
</tr>
<tr>
<td>( M (SD) )</td>
<td>27.8 (4.87)</td>
<td>26.0 (6.16)</td>
<td></td>
</tr>
<tr>
<td>Possible range</td>
<td>8.0 - 32.0</td>
<td>8.0 - 32.0</td>
<td></td>
</tr>
<tr>
<td>Obtained range</td>
<td>8.0 - 32.0</td>
<td>8.0 - 32.0</td>
<td></td>
</tr>
<tr>
<td>SE exercise</td>
<td></td>
<td></td>
<td>.78</td>
</tr>
<tr>
<td>( M (SD) )</td>
<td>24.7 (4.41)</td>
<td>24.4 (4.13)</td>
<td></td>
</tr>
<tr>
<td>Possible range</td>
<td>8.0 - 32.0</td>
<td>8.0 - 32.0</td>
<td></td>
</tr>
<tr>
<td>Obtained range</td>
<td>15.0 - 32.0</td>
<td>15.0 - 30.0</td>
<td></td>
</tr>
<tr>
<td>SE eating habits</td>
<td></td>
<td></td>
<td>.41</td>
</tr>
<tr>
<td>( M (SD) )</td>
<td>29.3 (4.25)</td>
<td>28.5 (4.43)</td>
<td></td>
</tr>
<tr>
<td>Possible range</td>
<td>9.0 - 36.0</td>
<td>9.0 - 36.0</td>
<td></td>
</tr>
<tr>
<td>Obtained range</td>
<td>20.0 - 36.0</td>
<td>21.0 - 36.0</td>
<td></td>
</tr>
<tr>
<td>SE medication-taking</td>
<td></td>
<td></td>
<td>.57</td>
</tr>
<tr>
<td>( M (SD) )</td>
<td>14.0 (2.55)</td>
<td>13.7 (1.82)</td>
<td></td>
</tr>
<tr>
<td>Possible range</td>
<td>0.0 - 16.0</td>
<td>0.0 - 16.0</td>
<td></td>
</tr>
<tr>
<td>Obtained range</td>
<td>2.0 - 16.0</td>
<td>1.0 - 16.0</td>
<td></td>
</tr>
<tr>
<td>SE overall score</td>
<td></td>
<td></td>
<td>.18</td>
</tr>
<tr>
<td>( M (SD) )</td>
<td>96.0 (11.94)</td>
<td>92.2 (12.36)</td>
<td></td>
</tr>
<tr>
<td>Possible range</td>
<td>29.0 - 116.0</td>
<td>29.0 - 116.0</td>
<td></td>
</tr>
<tr>
<td>Obtained range</td>
<td>66.0 - 116.0</td>
<td>61.0 - 116.0</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* SE = Self-efficacy

* \( p \leq .05 \)

Table 5.10: Differences in self-efficacy variables based on race.

75
<table>
<thead>
<tr>
<th>Variable</th>
<th>Caucasi ans $(n = 64)$</th>
<th>African-Americans $(n = 27)$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>OE score</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$M (SD)$</td>
<td>61.7 (7.47)</td>
<td>61.8 (4.28)</td>
<td>.92</td>
</tr>
<tr>
<td>Possible range</td>
<td>16.0 - 80.0</td>
<td>16.0 - 80.0</td>
<td></td>
</tr>
<tr>
<td>Obtained range</td>
<td>39.0 - 78.0</td>
<td>53.0 - 71.0</td>
<td></td>
</tr>
</tbody>
</table>

*Note. OE = Outcome expectancy*

* $p \leq .05$

Table 5.11: Differences in outcome expectancy variables based on race.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Caucasians (n = 64)</th>
<th>African-Americans (n = 27)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Self-care behavior</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$M \ (SD)$</td>
<td>37.8 (9.16)</td>
<td>36.6 (9.46)</td>
<td>.58</td>
</tr>
<tr>
<td>Possible range</td>
<td>13.0 - 52.0</td>
<td>13.0 - 52.0</td>
<td></td>
</tr>
<tr>
<td>Obtained range</td>
<td>13.0 - 52.0</td>
<td>16.0 - 51.0</td>
<td></td>
</tr>
<tr>
<td><strong>Glycosylated hemoglobin</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$M \ (SD)$</td>
<td>8.2 (0.02)</td>
<td>8.1 (0.02)</td>
<td>.85</td>
</tr>
<tr>
<td>Obtained range</td>
<td>5.1 - 15.9</td>
<td>5.9 - 14.0</td>
<td></td>
</tr>
</tbody>
</table>

* $p \leq .05$

Table 5.12: Differences in self-care behavior and glycosylated hemoglobin variables based on race.
CHAPTER 6

DISCUSSION

This study examined the relationships of psychosocial variables (social support, self-efficacy, and outcome expectations) to diabetes self-care behaviors and glycemic control in Caucasians and African-Americans with type 2 diabetes. Some of the study findings differ from other relevant existing studies. All findings, however, merit further discussion. This chapter will: (1) compare this study’s findings with existing findings; (2) discuss the study’s limitations; (3) identify recommendations for future research; and (4) discuss implications for clinical practice.

Relationship between Social Support and Self-Care Behaviors

In this study, social support was not significantly related to self-care behaviors for the total group, Caucasians, and African-Americans. Specifically, the number of social support persons and social support satisfaction were not significantly related to subjects’ adherence to the diabetes regimen.

Existing studies suggest that social support may positively influence the initiation and maintenance of diabetes self-care behaviors. Wilson et al. (1986) found health beliefs and social support as the most consistent and strongest predictors of self-care behaviors. Subjects who received support from friends and family reported higher
universal self-care behaviors than those without support (Wang & Fenske, 1996).

Similarly, Garay-Sevilla et al. (1995) found that higher adherence to diet and medication was positively associated with social support.

Previous studies have yielded different findings than the present one. Social support was conceptualized in different ways in previous studies since there is no universally accepted definition of social support. Further, social support was measured in various ways. For example, Wilson et al. (1986) used the ISEL to assess subjects' perceived availability of general social support. This questionnaire assessed four functions of social support (appraisal, belonging, tangible, self-esteem). Bailey and Lherisson-Cedeno (1997) used the SBI to measure general social support. Social support was conceptualized as emotional support, information support, appraisal support, and instrumental support (Bailey and Lherisson-Cedeno, 1997). In this study, social support was operationally defined as the comfort, emotional concern, and assistance individuals receive from family, friends, and/or significant others. The SSQ was used in this study to measure the number of support individuals and subjects' satisfaction with these individuals. Differences in study findings may possibly be due to: (1) different operational definitions of social support; and (2) different measurement scales for social support.

**Relationship between Self-Efficacy and Self-Care Behaviors**

In this study, analyses revealed no significant relationships between self-efficacy and self-care behaviors for the total group, Caucasians, and African-Americans. Specifically, subjects' SE sugar testing, SE exercise, SE eating habits, SE medication-
taking, and SE overall scores were not significantly related to their adherence to diabetes regimens.

Existing studies suggest that self-efficacy may positively influence diabetes self-care behaviors. Hurley and Shea (1992) found a positive relationship to exist between self-efficacy and self-care behaviors. Similarly, self-efficacy was found to be an important variable in relation to adherence to diabetes regimes (Ludlow & Gein, 1995). Kavanagh et al. (1993) revealed that self-efficacy was an effective predictor of adherence in the areas of diet and exercise. Kingery and Glasgow (1989) found that efficacy expectations were moderately strong predictors of self-care in the area of exercise and weaker predictors in the areas of blood glucose monitoring and diet. Efficacy expectations had the greatest effect on dietary adherence and exercise (Skelly et al., 1995).

Previous studies have yielded different results than the present one. However, some existing studies revealed significant relationships between self-efficacy and some self-care behaviors (e.g., diet and exercise), whereas other studies revealed weaker relationships between self-efficacy and self-care behaviors (e.g., diet and glucose testing). Self-efficacy was defined in a similar way in all existing studies and the present one. Differences in findings may be possibly due to different measurement scales for self-efficacy. For example, Ludlow and Gein (1995) used a slightly modified version of the IMDSES to measure levels of self-efficacy in four areas (general management, diet, medication-taking, exercise). In this study, the SEQ was used to measure subjects’
confidence in their abilities to perform a graded series of regimen behaviors in four regime areas (glucose testing, exercise, eating habits, medication-taking).

**Relationship between Outcome Expectations and Self-Care Behaviors**

In this study, analyses revealed a significant relationship between outcome expectations and self-care behaviors for the total group and African-Americans. Specifically, the OE score was significantly, positively correlated with self-care behaviors for these two groups. Therefore, the greater subjects’ beliefs that overall diabetes management will lead to certain outcomes, the greater subjects’ adherence to their diabetes regimens.

This study’s finding is consistent with existing studies. Outcome expectations may positively influence diabetes self-care behaviors. Glasgow et al. (1989) found that exercise and dietary modifications had the highest outcome expectations. Outcome expectations were moderately strong predictors of self-care in the area of exercise and weaker predictors in the areas of glucose testing and diet (Kingery & Glasgow, 1989). Similarly, Skelly et al. (1995) found that African-American subjects’ outcome expectations had an effect on glucose testing. Outcome expectations were defined in a similar way in all existing studies. In these studies, all investigators used the OEQ.

Although outcome expectancy subscale scores (e.g., exercise, glucose testing, diet, and medication-taking) are not reported in this study, findings suggest a significant relationship between the OE score and self-care behaviors in Caucasians and African-Americans with type 2 diabetes. These findings are congruent with other researchers who found significant relationships between these variables. This study’s results suggest that
the greater subjects’ beliefs that overall diabetes management will lead to certain outcomes, the greater subjects’ adherence to their diabetes regimens. Outcome expectations were defined in a similar way in all existing studies and the present one.

Relationship between Social Support and Glycemic Control

In this study, social support was not significantly related to glycemic control for the total group, Caucasians, and African-Americans. Specifically, the number of support persons and social support satisfaction were not significantly related to glycemic control.

Previous studies suggest that social support may be a predictor of glycemic control in individuals with diabetes. Greater social support was associated with better glycemic control in individuals with type 2 diabetes (Connell et al., 1992; Eriksson & Rosenqvist, 1993; Heitzmann & Kaplan, 1984; Schwartz et al., 1991). Contrary to these findings, however, social support was not a significant predictor of improved glycosylated hemoglobin levels (Griffith et al., 1990; Murphy et al., 1994; O'Connor et al., 1992). Heitzmann and Kaplan (1984) and Kaplan and Hartwell (1987) found that higher social support was negatively associated with glycemic control for men.

In this study, social support was not significantly related to glycemic control in the total group, Caucasians, and African-Americans. This study’s findings support the findings of Griffith et al. (1990), Murphy et al. (1994), and O'Connor et al. (1992). The relationship between social support and glycemic control is not clear. Mixed findings are cited in the literature. Differences in findings may be possibly due to: (1) different operational definitions of social support; and (2) different measurement scales for social support. For example, Eriksson and Rosenqvist (1993) developed and used a
questionnaire to assess the: (1) availability of and satisfaction with functional support; and (2) three functions of social support (emotional, practical, informative). In this study, social support was operationally defined as the comfort, emotional concern, and assistance individuals receive from family, friends, and/or significant others. The SSQ was used in this study to measure the number of support individuals and subjects' satisfaction with these individuals.

**Relationship between Self-Efficacy and Glycemic Control**

Few studies have explored the relationship between self-efficacy and glycemic control (as measured by glycosylated hemoglobin assays). In this study, self-efficacy was not significantly related to glycemic control for the total group, Caucasians, and African-Americans. Similarly, Ludlow and Gein (1995) found no significant relationships between: (1) exercise self-efficacy and glycosylated hemoglobin levels; and (2) medication self-efficacy and glycosylated hemoglobin levels. However, Ludlow and Gein (1995) also found that subjects with higher levels of general management self-efficacy and diet self-efficacy had lower glycosylated hemoglobin levels.

The relationship between self-efficacy and glycemic control is unclear. Mixed findings exist in the literature. Self-efficacy was defined in a similar way in all existing studies and the present one. Differences in findings may be possibly due to different measurement scales for self-efficacy. For example, Ludlow and Gein (1995) used a slightly modified version of the IMDES to measure levels of self-efficacy in four areas (general management, diet, medication-taking, exercise). In this study, the SEQ was used to measure subjects' confidence in their abilities to perform a graded series of regimen
behaviors in four regime areas (glucose testing, exercise, eating habits, medication-taking).

Relationship between Outcome Expectations and Glycemic Control

In this study, outcome expectations were not significantly related to glycemic control in the total group, Caucasians, and African-Americans. Previous studies have not explored the relationship between these variables. Therefore, this study yields new knowledge relevant to the variables impacting diabetes control in Caucasians and African-Americans with type 2 diabetes.

Differences in Variables According to Race

When considering the study variables (social support, self-efficacy, outcome expectations, self-care behaviors, and glycemic control), one significant difference was found between the two racial groups. A significant difference was found with regard to social support satisfaction. African-Americans in the study were less satisfied with their social support systems than Caucasians. No existing, published studies examined racial differences using the SSQ. Therefore, this finding yields new knowledge with regard to differences in variables between the two racial groups.

There are few existing, published studies that have examined differences in study variables between the two racial groups. Bailey and Lherisson-Cedano (1997) found no significant differences with regard to social support. In this study, no significant differences were found with regard to glycemic control. Contrary to this finding, Bailey and Lherisson-Cedano (1997) and Connell et al. (1992) found that African-Americans
had significantly higher glycosylated hemoglobin levels than Caucasians. Differences in findings may possibly be due to the heterogeneity of the racial groups in each study. In this study, the two racial groups were homogeneous with few significant differences in demographic and diabetes characteristics.

Few studies have examined the racial differences with regard to diabetes self-care behaviors. Schoenberg and Drungle (2001) found that African-Americans reported more financial, visual, and pain barriers to self-care than Caucasians. However, Schoenberg and Drungle (2001) found that both racial groups reported a reluctance to exercise and perform glucose testing. Similarly, in this study, no significant differences were revealed with regard to diabetes self-care behaviors.

Limitations

Like any single study, this investigation has limitations. The first limitation pertains to the number and type of questionnaires used in this study. Of the 170 subjects who provided informed consent to participate, only 91 actually completed all four questionnaires during the 36-month data collection period for a return rate of 54%. Five subjects (who withdrew from the study) verbally indicated that too much time was required to complete the four questionnaires. Four subjects completed three of the four questionnaires and did not respond to the SSQ (due to the time needed for completion of this lengthy instrument). It is also important to note that the study sample consisted of well-educated subjects with over 48% having some college or technical school experience. Also, the use of self-report measures created the potential for response bias with subjects responding as they deemed desirable. If fewer questionnaires would be
used, then perhaps: (1) subjects would be more willing to complete all of the
questionnaires; (2) less educated subjects would participate in the study; and (3) there
would be less likelihood of bias.

The second limitation pertains to the study’s design. At Sites B and C, it was
very difficult for subjects to complete all four of the instruments during their one-hour
clinic visits. Therefore, subjects were given the opportunity to mail their completed
questionnaires in self-addressed envelopes. If subjects had been able to complete all
questionnaires at the time of their clinic visits, then the return rate would have been closer
to 100%. Thus, the study should be redesigned to: (1) allow subjects adequate time to
complete all questionnaires at the time of their clinic visits; and/or (2) conduct personal
interviews to obtain the necessary data. It is important to note that a volunteer sample
was recruited from Sites A, B, and C. Subjects who agreed to participate were
individuals interested in the study.

The third limitation pertains to the use of multiple data collection sites (Sites A,
B, and C). Multiple data collection sites were necessary to obtain an adequate number of
subjects for the study. It was extremely difficult for one investigator to manage data
collection at these three sites. Further, Site A was approximately 90 miles from the PI’s
hometown.

The fourth limitation pertains to the study’s sample size. In this study, many
insignificant relationships were revealed between the study variables even though this
study's sample size was comparable to other relevant existing studies. Also, only one
significant difference was found between the racial groups. Perhaps more significant
differences would be found if a larger sample size was obtained. A larger sample would provide more power to detect significant correlations between the variables and/or significant differences between the groups. Thus, further investigation with a larger size may suggest the existence or nonexistence of the relationships of these variables and/or significant differences between the racial groups.

Recommendations

After completion of this study, four recommendations are suggested. The first recommendation is to further investigate the study variables by conducting multiple studies each examining fewer variables. For example, the PI may solely examine the relationship between: (1) self-efficacy and self-care behaviors; and (2) outcome expectancy and self-care behaviors in Caucasians and African-Americans. This approach would: (1) decrease the number of questionnaires used in the study and permit easier subject questionnaire completion; and (2) lessen the complexity of this study.

The second recommendation involves modifying the study design to maximize the return rate of subjects' questionnaires. This can best be accomplished by: (1) allowing adequate time for subjects to complete all questionnaires; and/or (2) conducting personal interviews to obtain necessary data. If fewer variables are studied, then less time is needed for questionnaire completion.

The third recommendation involves having multiple investigators manage data collection at the various sites. This approach would: (1) simplify the data collection process for the PI; and (2) assist with the recruitment of more subjects for the study. All
investigators would be trained by the PI to insure consistency during the data collection process.

The final recommendation is to investigate the availability of current and less complex instruments to measure the study variables. Since some subjects found the SSQ difficult to complete, it is important to examine other instruments that measure social support. The PI may find it appropriate to modify an existing questionnaire or design a new one.

This study poses the following additional questions:

1. With a larger sample size, will there be significant relationships between the study variables for Caucasians and African-Americans?

2. With a larger sample size, will there be significant differences in the variables according to race?

3. What is the relationship between subject age and adherence to the diabetes regimen for Caucasians and African-Americans?

4. What is the relationship between subject age and glycemic control for Caucasians and African-Americans?

5. What is the relationship between duration of diabetes and adherence to the diabetes regimen for Caucasians and African-Americans?

6. What is the relationship between duration of diabetes and glycemic control for Caucasians and African-Americans?

7. What is the relationship between education and adherence to the diabetes regimen for Caucasians and African-Americans?
8. What is the relationship between education and glycemic control for Caucasians and African-Americans?

9. Are there other psychosocial variables that can explain the diabetes health disparities between Caucasians and African-Americans?

10. What other variables can explain the health disparities between Caucasians and African-Americans?

It is important to investigate the relationships between other variables (e.g., age, duration of diabetes, education) and self-care behaviors and glycemic control. Specifically, are there racial differences that may help to explain the diabetes health disparities between Caucasians and African-Americans?

Implications for Clinical Practice

The results of this study have implications for diabetes educators and health care providers. One implication is that outcome expectations affect individuals’ adherence to their diabetes regimens. The greater individuals’ beliefs that overall diabetes management will lead to certain outcomes, the greater their adherence to diabetes regimens. This evidence can be useful in planning professional interventions (e.g., education, consultation). For example, during an education session with a client and family members, the diabetes educator may wish to emphasize the short and long-term benefits of diabetes management to promote adherence to diabetes regimens. Or, during consultation with the client, the health care provider may wish to allow additional time for the expression of beliefs about diabetes management. Perhaps these professional
interventions will enhance self-care management in Caucasians and African-Americans with type 2 diabetes.

When considering the study variables, one significant difference was found between the racial groups. African-Americans reported less social support satisfaction than Caucasians. The availability of social support may directly affect African-Americans' ability to adapt to life-style changes associated with type 2 diabetes. This finding can be helpful as health care providers care for African-Americans with type 2 diabetes.

Other than social support, no other significant differences were found in the study variables between Caucasians and African-Americans. This evidence suggests that with homogeneous groups (e.g., similar age, duration of diabetes, education) there are no significant differences between the racial groups. Although health disparities exist between Caucasians and African-Americans, these disparities may not be related to psychosocial variables. The existing disparities may possibly be due to other factors (e.g., heredity, financial barriers, inadequate health care). This finding yields new knowledge for diabetes educators and health care providers and suggests areas for future research.

Conclusion

Type 2 diabetes continues to be a major health and financial concern in the United States. Caucasians and African-Americans with type 2 diabetes continue to experience preventable diabetes-related life-threatening complications despite medical advances and health care availability. African-Americans are more likely to suffer from diabetes-
related complications and experience a higher diabetes-related mortality rate than Caucasiann.

In this study, no significant relationships were found between: (1) social support and self-care behaviors; and (2) self-efficacy and self-care behaviors. Outcome expectations were found to positively affect individuals' adherence to their diabetes regimens. African-Americans reported less social support satisfaction than Caucasians. No other significant differences were found in study variables between Caucasians and African-Americans. Analyses revealed that with homogenous groups (e.g., similar age, duration of diabetes, education), there were no significant differences between the racial groups.

Although health disparities exist between Caucasians and African-Americans, these disparities may not be related to psychosocial variables. The existing disparities may possibly be due to other factors (e.g., heredity, financial barriers, inadequate health care). Additional investigations to study the: (1) relationships of age, duration of diabetes, and education to diabetes control; and (2) relationships of other variables (e.g., heredity, financial barriers, inadequate health care) to diabetes control are warranted.
REFERENCES


APPENDIX A

THE OHIO STATE UNIVERSITY IRB APPROVAL LETTERS
ACTION OF THE INSTITUTIONAL REVIEW BOARD

With regard to the employment of human subjects in the proposed research protocol:

96B0087 IMPACT OF SOCIAL SUPPORT, SELF-EFFICACY, AND OUTCOME EXPECTATIONS ON SELF-CARE BEHAVIORS AND GLYCEMIC CONTROL IN CAUCASIAN AND AFRICAN-AMERICAN ADULTS WITH NON-INSULIN-DEPENDENT DIABETES; Bonnie J. Garvin, Diane Orr Chlebaw, Adult Health and Illness

THE BEHAVIORAL AND SOCIAL SCIENCES HUMAN SUBJECTS IRB HAS TAKEN THE FOLLOWING ACTION:

_____ APPROVED  _____ DISAPPROVED  
____ X APPOVED WITH CONDITIONS*  _____ WAIVER OF WRITTEN CONSENT GRANTED

* Conditions stated by the IRB have been met by the investigator and, therefore, the protocol is APPROVED.

It is the responsibility of the principal investigator to retain a copy of each signed consent form for at least three (3) years beyond the termination of the subject's participation in the proposed activity. Should the principal investigator leave the University, signed consent forms are to be transferred to the Human Subjects IRB for the required retention period. This application has been approved for the period of one year. You are reminded that you must promptly report any problems to the IRB, and that no procedural changes may be made without prior review and approval. You are also reminded that the identity of the research participants must be kept confidential.

Date: August 21, 1998

Signed: ____________________________________

(Chairperson)
BEHAVIORAL AND SOCIAL SCIENCES
HUMAN SUBJECTS INSTITUTIONAL REVIEW BOARD (IRB)
THE OHIO STATE UNIVERSITY

Research Involving Human Subjects

ACTION OF THE INSTITUTIONAL REVIEW BOARD

With regard to the employment of human subjects in the proposed research protocol:

98B0067 IMPACT OF SOCIAL SUPPORT, SELF-EFFICACY, AND OUTCOME EXPECTATIONS ON SELF-CARE BEHAVIORS AND GLYCEMIC CONTROL IN CAUCASIAN AND AFRICAN-AMERICAN ADULTS WITH NON-INSULIN-DEPENDENT DIABETES, Bonnie J. Garvin, Diane Orr Chlobovy, Adult Health and Illness

THE BEHAVIORAL AND SOCIAL SCIENCES HUMAN SUBJECTS IRB HAS TAKEN THE FOLLOWING ACTION:

____ APPROVED  ______ DISAPPROVED

____x____ APPROVED WITH CONDITIONS*  ______ WAIVER OF WRITTEN CONSENT GRANTED

* Conditions stated by the IRB have been met by the Investigator and, therefore, the protocol is APPROVED.

It is the responsibility of the principal investigator to retain a copy of each signed consent form for at least three (3) years beyond the termination of the subject's participation in the proposed activity. Should the principal investigator leave the University, signed consent forms are to be transferred to the Human Subjects IRB for the required retention period. This application has been approved for the period of one year. You are reminded that you must promptly report any problems to the IRB, and that no procedural changes may be made without prior review and approval. You are also reminded that the identity of the research participants must be kept confidential.

Date: July 16, 1999

Signed: Don M. Adler

(Chairperson)

HS-25B (Rev. 2/94)
research involving human subjects

**action of the institutional review board**

With regard to the employment of human subjects in the proposed research protocol:

**SB0087** IMPACT OF SOCIAL SUPPORT, SELF-EFFICACY, AND OUTCOME EXPECTATIONS ON SELF-CARE BEHAVIORS AND GLYCEMIC CONTROL IN CAUCASIAN AND AFRICAN-AMERICAN ADULTS WITH NON-INSULIN-DEPENDENT DIABETES, Bonnie J. Garvin, Diane Orr Chlebowy, Adult Health and Illness Nursing

**the behavioral and social sciences human subjects IRB has taken the following action:**

- **X** APPROVED
- _____ DISAPPROVED
- _____ APPROVED WITH CONDITIONS
- _____ WAIVER OF WRITTEN CONSENT GRANTED

* Conditions stated by the IRB have been met by the investigator and, therefore, the protocol is APPROVED.

It is the responsibility of the principal investigator to retain a copy of each signed consent form for at least three (3) years beyond the termination of the subject's participation in the proposed activity. Should the principal investigator leave the University, signed consent forms are to be transferred to the Human Subjects IRB for the required retention period. This application has been approved for the period of one year. You are reminded that you must promptly report any problems to the IRB, and that no procedural changes may be made without prior review and approval. You are also reminded that the identity of the research participants must be kept confidential.

**Date:** July 14, 2000

**Signed:**

(Chairperson)
BEHAVIORAL AND SOCIAL SCIENCES
HUMAN SUBJECTS INSTITUTIONAL REVIEW BOARD (IRB)
The Ohio State University, Columbus, OH 43210

Research Involving Human Subjects
ACTION OF THE INSTITUTIONAL REVIEW BOARD

X Full Committee Review  X Original Review
X Expedited Review  X Continuing Review
X Amendment

With regard to the employment of human subjects in the proposed research protocol:

9380687 IMPACT OF SOCIAL SUPPORT, SELF-EFFICACY, AND OUTCOME EXPECTATIONS ON SELF-CARE BEHAVIORS AND GLYCEMIC CONTROL IN CAUCASIAN AND AFRICAN-AMERICAN ADULTS WITH TYPE 2 DIABETES MELLITUS, Bonnie J. Gervin, Diane Orr Chiebowy, Adult Health and Illness Nursing

Request to amend the protocol as outlined in a letter dated June 22, 2001, was APPROVED BY EXPEDITED REVIEW (category 7) on July 10, 2001. The following changes were approved: (a) change of title. The last words are now “with type 2 diabetes mellitus” instead of “with non-insulin dependent diabetes”; (b) change of site to the University of Kentucky outpatient clinic; (c) change in incentive from $5 gift certificate to $5 cash for each phase of the study; (d) changes to the information letter and the “thank you” letter to reflect the change in incentive; and (e) approval for use of the consent form that was approved by the University of Kentucky IRB, instead of the version originally approved by the OSU IRB.

THE BEHAVIORAL AND SOCIAL SCIENCES HUMAN SUBJECTS IRB HAS TAKEN THE FOLLOWING ACTION:

X APPROVED  DISAPPROVED

APPROVED WITH CONDITIONS * WAIVER OF WRITTEN CONSENT GRANTED

* Conditions stated by the IRB have been met by the investigator and, therefore, the protocol is APPROVED.

- It is the responsibility of the principal investigator to retain a copy of each signed consent form for at least three (3) years beyond the termination of the subject’s participation in the proposed activity. Should the principal investigator leave the University, signed consent forms are to be transferred to the Human Subjects IRB for the required retention period.

- This application has been approved for the period of one year.

- You are reminded that you must promptly report any problems to the IRB and that no procedural changes may be made without prior review and approval.

- You are also reminded that the identity of the research participants must be kept confidential.

Date: July 10, 2001
Signed: [Signature]

(HS-025B (Rev. 2/64)
BEHAVIORAL AND SOCIAL SCIENCES
HUMAN SUBJECTS INSTITUTIONAL REVIEW BOARD (IRB)
The Ohio State University, Columbus, OH 43210

Research Involving Human Subjects
ACTION OF THE INSTITUTIONAL REVIEW BOARD

X Full Committee Review  X Original Review
_____ Expedited Review  _____ Continuing Review

_____ Amendment

With regard to the employment of human subjects in the proposed research protocol:

98B0087 IMPACT OF SOCIAL SUPPORT, SELF-EFFICACY, AND OUTCOME EXPECTATIONS ON SELF-CARE BEHAVIORS AND GLYCEMIC CONTROL IN CAUCASIAN AND AFRICAN-AMERICAN ADULTS WITH TYPE 2 DIABETES MELLITUS, Bonnie J. Garvin, Diane Orr Chebowy, Adult Health and Illness Nursing

THE BEHAVIORAL AND SOCIAL SCIENCES HUMAN SUBJECTS IRB HAS TAKEN THE FOLLOWING ACTION:

X APPROVED  _____ DISAPPROVED

_____ APPROVED WITH CONDITIONS *

* Conditions stated by the IRB have been met by the investigator and, therefore, the protocol is APPROVED.

- It is the responsibility of the principal investigator to retain a copy of each signed consent form for at least three (3) years beyond the termination of the subject's participation in the proposed activity. Should the principal investigator leave the University, signed consent forms are to be transferred to the Human Subjects IRB for the required retention period.

- This application has been approved for the period of one year.

- You are reminded that you must promptly report any problems to the IRB and that no procedural changes may be made without prior review and approval.

- You are also reminded that the identity of the research participants must be kept confidential.

Date: ___________________ Signed: ___________________

(Chairperson)

HS-025B (Rev. 2/94)
BEHAVIORAL AND SOCIAL SCIENCES
HUMAN SUBJECTS INSTITUTIONAL REVIEW BOARD (IRB)
The Ohio State University, Columbus, OH 43210

Research Involving Human Subjects
ACTION OF THE INSTITUTIONAL REVIEW BOARD

__________________________  ________________  ________________  ________________
Full Committee Review       Original Review               Continuation Review
Expedited Review               X                      X

Amendment

With regard to the employment of human subjects in the proposed research protocol:

9850087  IMPACT OF SOCIAL SUPPORT, SELF-EFFICACY, AND OUTCOME EXPECTATIONS ON SELF-CARE BEHAVIORS AND GLYCEMIC CONTROL IN CAUCASIAN AND AFRICAN-AMERICAN ADULTS WITH TYPE 2 DIABETES MELLITUS, Bonnie J. Garvin, Diane Orr Chlebowy, Adult Health and Illness Nursing

Request to amend the protocol as outlined in a letter dated August 31, 2001, was APPROVED WITH CONDITIONS by means of expedited review (category 7) on September 12, 2001. The following changes were approved: (a) collection of data from approximately 36 subjects at Lexington-Fayette County Health Department, and (b) revision of the Consent to Participate in Study to reflect the new site.

THE BEHAVIORAL AND SOCIAL SCIENCES HUMAN SUBJECTS IRB HAS TAKEN THE FOLLOWING ACTION:

__________________________  ________________  ________________  ________________
APPROVED                      DISAPPROVED         WAIVER OF WRITTEN CONSENT GRANTED

X  APPROVED WITH CONDITIONS *

* Conditions stated by the IRB have been met by the investigator and, therefore, the protocol is APPROVED.

- It is the responsibility of the principal investigator to retain a copy of each signed consent form for at least three (3) years beyond the termination of the subject's participation in the proposed activity. Should the principal investigator leave the University, signed consent forms are to be transferred to the Human Subjects IRB for the required retention period.

- This application has been approved for the period of one year.

- You are reminded that you must promptly report any problems to the IRB and that no procedural changes may be made without prior review and approval.

- You are also reminded that the identity of the research participants must be kept confidential.

Data:  September 12, 2001       Signed:  
(Chairperson)

HS-025B (Rev. 2/94)

105
BEHAVIORAL AND SOCIAL SCIENCES
HUMAN SUBJECTS INSTITUTIONAL REVIEW BOARD (IRB)
The Ohio State University, Columbus, OH 43210

Research Involving Human Subjects
ACTION OF THE INSTITUTIONAL REVIEW BOARD

Full Committee Review Expedited Review Original Review Continuing Review Amendment

With regard to the employment of human subjects in the proposed research protocol:

SB0657 IMPACT OF SOCIAL SUPPORT, SELF-EFFICACY, AND OUTCOME EXPECTATIONS ON SELF-CARE BEHAVIORS AND GLYCEMIC CONTROL IN CAUCASIAN AND AFRICAN-AMERICAN ADULTS WITH TYPE II DIABETES MELLITUS, Donna J. Garvin, Diane Orr Cheiboway, Adult Health and Illness Nursing

Request to amend the protocol as outlined in a letter dated September 24, 2001, was APPROVED by means of expedited review (category 7) on October 12, 2001. The committee approved the following: (a) addition of Kentucky Clinic North as a data collection site, (b) recruitment of approximately 24 subjects at this site, and (c) revision of the consent form for use at this site.

THE BEHAVIORAL AND SOCIAL SCIENCES HUMAN SUBJECTS IRB HAS TAKEN THE FOLLOWING ACTION:

X APPROVED

DISAPPROVED

APPROVED WITH CONDITIONS *

WAIVER OF WRITTEN CONSENT GRANTED

* Conditions stated by the IRB have been met by the investigator and, therefore, the protocol is APPROVED.

- It is the responsibility of the principal investigator to retain a copy of each signed consent form for at least three (3) years beyond the termination of the subject’s participation in the proposed activity. Should the principal investigator leave the University, signed consent forms are to be transferred to the Human Subjects IRB for the required retention period.
- This application has been approved for the period of one year.
- You are reminded that you must promptly report any problems to the IRB and that no procedural changes may be made without prior review and approval.
- You are also reminded that the identity of the research participants must be kept confidential.

Date: October 12, 2001

Signed:

(Chairperson)

HS-025B (Rev. 2/94)

106
BEHAVIORAL AND SOCIAL SCIENCES
HUMAN SUBJECTS INSTITUTIONAL REVIEW BOARD (IRB)
The Ohio State University, Columbus, OH 43210

Research Involving Human Subjects
ACTION OF THE INSTITUTIONAL REVIEW BOARD

X Full Committee Review _____ Original Review
_____ Expedited Review ______ Continuing Review
_____ Amendment

With regard to the employment of human subjects in the proposed research protocol:

98B0087 IMPACT OF SOCIAL SUPPORT, SELF-EFFICACY, AND OUTCOME EXPECTATIONS ON SELF-CARE BEHAVIORS AND GLYCEMIC CONTROL IN CAUCASIAN AND AFRICAN-AMERICAN ADULTS WITH TYPE 2 DIABETES MELLITUS, Bonnie J. Garvin, Diane Orr Chlebowski, Nursing

THE BEHAVIORAL AND SOCIAL SCIENCES HUMAN SUBJECTS IRB HAS TAKEN THE FOLLOWING ACTION:

X APPROVED _______ DISAPPROVED

____ APPROVED WITH CONDITIONS *

* Conditions stated by the IRB have been met by the investigator and, therefore, the protocol is APPROVED.

- It is the responsibility of the principal investigator to retain a copy of each signed consent form for at least three (3) years beyond the termination of the subject's participation in the proposed activity. Should the principal investigator leave the University, signed consent forms are to be transferred to the Human Subjects IRB for the required retention period.

- This application has been approved for the period of one year.

- You are reminded that you must promptly report any problems to the IRB and that no procedural changes may be made without prior review and approval.

- You are also reminded that the identity of the research participants must be kept confidential.

Date: June 28, 2002 Signed: [Signature]

(Chairperson)

HS-025B (Rev. 2/94)
APPENDIX B

THE UNIVERSITY OF KENTUCKY IRB APPROVAL LETTERS
TO: Diane Chlobowy, MS, MA, RN  
Nursing Administration  
315 Health Sciences Learning Ctr.  
0332

FROM: Chairperson/Vice Chairperson  
Medical Institutional Review Board (IRB)

SUBJECT: Approval of Protocol Number 01-0378-P2R

DATE: June 13, 2001

On June 12, 2001, the Medical Institutional Review Board approved your protocol entitled:

_Caucasian and African-American Adults with Type 2 Diabetes Mellitus_

This approval extends to any consent/assent document unless the IRB has waived the requirement for documentation of informed consent.

Approval is effective from June 12, 2001 until June 11, 2002. If applicable, attached is the IRB approved consent/assent document(s) to be used when enrolling subjects. [Note, subjects can only be enrolled using consent/assent forms which have a valid "IRB Approval" stamp unless special waiver has been obtained from the IRB.] Prior to the end of this period, you will be sent a Continuation Review Report Form which must be completed and returned to the Office of Research Integrity so that the protocol can be reviewed and approved for the next period.

In implementing the research activities, you are responsible for complying with IRB decisions, conditions, and requirements. The research procedures should be implemented as approved in the IRB protocol. It is the principal investigator/’s responsibility to ensure any changes planned for the research are submitted for review and approval by the IRB prior to implementation.

Attached for your review is a booklet describing investigator responsibilities after IRB approval has been obtained. Please read the information carefully and retain a copy for your files. If you have questions or need additional information, contact the Office of Research Integrity at (859) 257-8315 (Medical) or (859) 257-3138 (Nonmedical).

_Chiristopher Shear, MD, FIDC_
Chairperson/Vice Chairperson
TO: Diane Chlebawy, MS, MA, RN
    Nursing Administration
    315 Health Sciences Learning Ctr.
    0232

FROM: Chairperson/Vice Chairperson
    Institutional Review Board (IRB)

SUBJECT: Approval of Modification Request for Protocol 01-0378-P2R

DATE: September 7, 2001

On September 5, 2001, the Institutional Review Board approved your request for modifications in your protocol entitled:

    Caucasian and African-American Adults with Type 2 Diabetes Mellitus

If your modification request necessitated a change in your approved informed consent/assent form(s), attached is the new IRB approved consent/assent form(s) to be used when enrolling subjects. [Note: subjects can only be enrolled using informed consent/assent forms which have a valid "IRB Approval" stamp, unless waiver from this requirement was granted by the IRB.]

If you need further assistance or have questions, please call the Institutional Review Board, Office of Research Integrity, at 257-8315 (Medical) or 257-3138 (Nonmedical).

[Signature]
Chairperson/Vice Chairperson
Amendment Review  
New site - KY Clinic North  
Approval Ends  
June 11, 2002  
IRB Number  
01-0378-P2R

TO:  
Diane Chiebowy, MS, MA, RN  
Nursing Administration  
315 Health Sciences Learning Ctr.  
0232

FROM:  
Chairperson/Vice Chairperson  
Institutional Review Board (IRB)

SUBJECT:  
Approval of Modification Request for Protocol 01-0378-P2R

DATE:  
September 19, 2001

On September 5, 2001, the Institutional Review Board approved your request for modifications in your protocol entitled:

_Caucasian and African-American Adults with Type 2 Diabetes Mellitus_

If your modification request necessitated a change in your approved informed consent/assent form(s), attached is the new IRB approved consent/assent form(s) to be used when enrolling subjects. [Note, subjects can only be enrolled using informed consent/assent forms which have a valid "IRB Approval" stamp, unless waiver from this requirement was granted by the IRB.]

If you need further assistance or have questions, please call the Institutional Review Board, Office of Research Integrity, at 257-8315 (Medical) or 257-3138 (Nonmedical).

[Signature]
Chairperson/Vice Chairperson
Continuation Expedited Review
Amendment Approved - Age level of subjects
Exemption Approved

Approval Ends Project Ends IRB Number
May 20, 2003 December 31, 2002 01-0378-P2R

TO: Diane Chlebowy, MS, MA, RN
Nursing Administration
315 Health Sciences Learning Ctr.
0231

FROM: Chairperson/Vice Chairperson
Medical Institutional Review Board (IRB)

SUBJECT: Approval of Protocol Number 01-0378-P2R

DATE: May 21, 2002

On May 21, 2002, the Medical Institutional Review Board approved your protocol entitled:

Caucasian and African-American Adults with Type 2 Diabetes Mellitus

Approval is effective from May 21, 2002 until May 20, 2003. This approval extends to any consent/assent document unless the IRB has waived the requirement for documentation of informed consent. If applicable, attached is the IRB approved consent/assent document(s) to be used when enrolling subjects. [Note, subjects can only be enrolled using consent/assent forms which have a valid "IRB Approval" stamp unless special waiver has been obtained from the IRB.] Prior to the end of this period, you will be sent a Continuation Review Report Form which must be completed and returned to the Office of Research Integrity so that the protocol can be reviewed and approved for the next period.

In implementing the research activities, you are responsible for complying with IRB decisions, conditions and requirements. The research procedures should be implemented as approved in the IRB protocol. It is the principal investigator's responsibility to ensure any changes planned for the research are submitted for review and approval by the IRB prior to implementation.

Attached for your review is a booklet describing investigator responsibilities after IRB approval has been obtained. Please read the information carefully and retain a copy for your files. If you have questions or need additional information, contact the Office of Research Integrity at 859-257-4315 (Medical) or 859-257-3138 (Nonmedical).

Chairperson/Vice Chairperson

An Equal Opportunity/University
APPENDIX C

JEWISH HOSPITAL APPROVAL LETTER
August 17, 1998

Diane Chlebowski
4809 Matthew Ct.
Lexington, KY 40514

Re: Impact of Social Support, Self-Efficacy, and Outcome Expectations on Self-Care Behaviors and Glycemic Control in Caucasian and African-American Adults with Non-Insulin-Dependent Diabetes Mellitus

Dear Ms. Chlebowski,

I have reviewed the above named protocol and this letter will notify you of approval of the Jewish Hospital Institutional Review Board for this project.

The committee will request an annual report which will include the number of patients enrolled. When the study is completed, the committee will request a similar report notifying it of the termination of the study and the number of patients enrolled. If a paper is published as a result of this study, the committee requests that you send a copy.

Sincerely,

John Ogden, M.D., Chairman
Institutional Review Board

LO/ep
APPENDIX D

SCRIPT FOR OBTAINING INFORMED CONSENT
As each potential subject registers for the educational sessions, the organization's secretary will read the following script to obtain informed consent for mailing of the letter and consent form.

A research nurse who is interested in helping persons with diabetes is doing a study to look at different factors which may affect diabetes behaviors and blood sugar control in persons with diabetes. She is requesting your participation in this study. Your participation is voluntary and your decision to participate or not participate in the study will not affect in any way the education and care that you receive. Does she have your permission to mail you written materials which will further explain this study? Thank you for your time.
APPENDIX E

INFORMATION LETTER
Dear Diabetes Patient,

We are research nurses interested in helping persons with diabetes. We are also very interested in patient teaching and the ways in which diabetes classes can help those with diabetes. Presently, we are doing a study which looks at different factors which may affect diabetes behaviors and blood sugar control in persons with diabetes.

We are requesting your participation in this study. Before you go to your first diabetes class, you will be asked to answer four forms about your feelings, beliefs, and usual behaviors. It will take you about 45 minutes to complete these forms. You will receive a $5 gift certificate in appreciation for your time and effort. Four months after your last diabetes class, you will be again asked to answer these same forms. It will again take you about 45 minutes to complete these forms and you will receive a $5 gift certificate in appreciation for your time and effort. As part of the study, your blood sugar values and some information about you will be obtained from your medical record. Also, a few of the classes will be audiotaped to allow us to determine what is being taught and the ways in which content is presented in the program. After this study is completed, this audiotaped information will be erased.

Your participation is voluntary. If you agree to participate and then change your mind, at any time, you can withdraw your participation from the study. Your decision to participate or not participate in the study will not affect in any way the education and care that you receive. Your identity will remain confidential. You will be assigned a number and this will be used on the information we get from you. Your information will be added to information obtained from others in the study and will be reported as group information.
The information from this study will help nurses and other health care team members to better understand factors which may affect diabetes behaviors and blood sugar control in persons with diabetes. If you are willing to participate in this study, please sign the enclosed consent form and complete the enclosed questionnaires. Then, please return the signed consent form and the completed questionnaires in the self-addressed envelope prior to attending your first diabetes class. If you have any questions about this study feel free to call us at (606)257-4204. Thank you for your time.

Sincerely,

Bonnie J. Darvin, Ph.D., R.N.
Principal Investigator
Associate Professor and Chair, The Ohio State University

Diane Orr Chlebowy, M.S., M.A., R.N.
Co-Investigator
Doctoral Candidate, The Ohio State University
APPENDIX F

CONSENT FORM FOR USE AT JEWISH HOSPITAL
CONSENT FOR PARTICIPATION IN SOCIAL AND BEHAVIORAL RESEARCH

I consent to participating in the research study entitled:

Impact of Social Support, Self-Efficacy, and Outcome Expectations on Self-Care Behaviors and Glycemic Control in Caucasian and African-American Adults with Non-Insulin-Dependent Diabetes Mellitus

Diane Orr-Chlebowski or her authorized representative has explained the purpose of the study, the procedures to be followed, and the expected duration of my participation. Possible benefits of the study have been described as have alternative procedures, if such procedures are applicable and available.

I acknowledge that I have had the opportunity to obtain additional information regarding the study and that any questions I have asked have been answered to my full satisfaction. Furthermore, I understand that I am free to withdraw consent at any time and to discontinue participation in the study without prejudice to me.

Finally, I acknowledge that I have read and fully understand the consent form. I sign it freely and voluntarily. A copy has been given to me.

Date: 1/26/99

Signed: ____________________________
(Participant)

Signed: ____________________________
(Principal Investigator)

Signed: ____________________________
(Person authorized to consent for participant)

Signed: ____________________________
(Co-Principal Investigator or her authorized representative)

Witness: ____________________________

The most comprehensive health sciences center in America
College of Dentistry / College of Medicine and Public Health / College of Nursing / College of Optometry / College of Pharmacy / College of Veterinary Medicine / School of Allied Medical Professions / The Ohio State University Hospitals / The Arthur G. James Cancer Hospital and Research Institute

121
APPENDIX G

SOCIAL SUPPORT QUESTIONNAIRE
Social Support Questionnaire
SSQ

INSTRUCTIONS:

The following questions ask about people in your environment who provide you with help or support. Each question has two parts. For the first part, list all the people you know, excluding yourself, whom you can count on for help or support in the manner described. Give the person's initials and their relationship to you (see example). Do not list more than one person next to each of the letters beneath the question.

For the second part, circle how satisfied you are with the overall support you have.

If you have no support for a question, check the words "No one," but still rate your level of satisfaction. Do not list more than nine persons per question.

Please answer all questions as best you can. All your responses will be kept confidential.

EXAMPLE:

Who do you know whom you can trust with information that could get you in trouble?

No one 1) T.N. (brother) 4) T.N. (father) 7)
2) L.M. (friend) 5) L.M. (employer) 8)
3) R.S. (friend) 6) 9)

How satisfied?
6 - very satisfied 5 - fairly satisfied 4 - a little satisfied 3 - a little dissatisfied 2 - fairly dissatisfied 1 - very dissatisfied
1. Whom can you really count on to listen to you when you need to talk?

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2. Whom could you really count on to help you if a person whom you thought was a good friend insulted you and told you that he/she didn’t want to see you again?

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3. Whose lives do you feel that you are an important part of?

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4. Whom do you feel would help you if you were married and had just separated from your spouse?

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5. Whom could you really count on to help you out in a crisis situation, even though they would have to go out of their way to do so?

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6. Whom can you talk with frankly, without having to watch what you say?

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7. Who helps you feel that you truly have something positive to contribute to others?

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8. Whom can you really count on to distract you from your worries when you feel under stress?

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9. Whom can you really count on to be dependable when you need help?

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10. Whom could you really count on to help you out if you had just been fired from your job or expelled from school?

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11. With whom can you totally be yourself?

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12. Whom do you feel really appreciates you as a person?

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13. Whom can you really count on to give you useful suggestions that help you to avoid making mistakes?

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<td>4 - a little satisfied</td>
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<td>3 - a little dissatisfied</td>
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<tr>
<td>2 - fairly dissatisfied</td>
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<tr>
<td>1 - very dissatisfied</td>
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</tbody>
</table>

No one 1) 2) 3) 4) 5) 6) 7) 8) 9)

14. Whom can you count on to listen openly and uncritically to your innermost feelings?

<table>
<thead>
<tr>
<th>How satisfied?</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 - very satisfied</td>
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<td>2 - fairly dissatisfied</td>
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<tr>
<td>1 - very dissatisfied</td>
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</tbody>
</table>

No one 1) 2) 3) 4) 5) 6) 7) 8) 9)

15. Who will comfort you when you need it by holding you in their arms?

<table>
<thead>
<tr>
<th>How satisfied?</th>
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<tbody>
<tr>
<td>6 - very satisfied</td>
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<td>2 - fairly dissatisfied</td>
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<td>1 - very dissatisfied</td>
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No one 1) 2) 3) 4) 5) 6) 7) 8) 9)

16. Whom do you feel would help if a good friend of yours had been in a car accident and was hospitalized in serious condition?

<table>
<thead>
<tr>
<th>How satisfied?</th>
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<tbody>
<tr>
<td>6 - very satisfied</td>
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<td>1 - very dissatisfied</td>
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No one 1) 2) 3) 4) 5) 6) 7) 8) 9)

17. Whom can you really count on to help you feel more relaxed when you are under pressure or tense?

<table>
<thead>
<tr>
<th>How satisfied?</th>
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<tbody>
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<td>6 - very satisfied</td>
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<td>2 - fairly dissatisfied</td>
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<td>1 - very dissatisfied</td>
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</tbody>
</table>

No one 1) 2) 3) 4) 5) 6) 7) 8) 9)

18. Whom do you feel would help if a family member very close to you died?

<table>
<thead>
<tr>
<th>How satisfied?</th>
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<tbody>
<tr>
<td>6 - very satisfied</td>
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<td>5 - fairly satisfied</td>
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<td>4 - a little satisfied</td>
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<td>3 - a little dissatisfied</td>
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<tr>
<td>2 - fairly dissatisfied</td>
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<tr>
<td>1 - very dissatisfied</td>
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</table>

No one 1) 2) 3) 4) 5) 6) 7) 8) 9)
19. Who accepts you totally, including both your worst and your best points?

<table>
<thead>
<tr>
<th>No one</th>
<th>1)</th>
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<th>4)</th>
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How satisfied?

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<th>5 - fairly satisfied</th>
<th>4 - a little satisfied</th>
<th>3 - a little dissatisfied</th>
<th>2 - fairly dissatisfied</th>
<th>1 - very dissatisfied</th>
</tr>
</thead>
</table>

20. Whom can you really count on to care about you, regardless of what is happening to you?

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<thead>
<tr>
<th>No one</th>
<th>1)</th>
<th>2)</th>
<th>3)</th>
<th>4)</th>
<th>5)</th>
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<th>7)</th>
<th>8)</th>
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How satisfied?

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<th>4 - a little satisfied</th>
<th>3 - a little dissatisfied</th>
<th>2 - fairly dissatisfied</th>
<th>1 - very dissatisfied</th>
</tr>
</thead>
</table>

21. Whom can you really count on to listen to you when you are very angry at someone else?

<table>
<thead>
<tr>
<th>No one</th>
<th>1)</th>
<th>2)</th>
<th>3)</th>
<th>4)</th>
<th>5)</th>
<th>6)</th>
<th>7)</th>
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How satisfied?

<table>
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<tr>
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<th>4 - a little satisfied</th>
<th>3 - a little dissatisfied</th>
<th>2 - fairly dissatisfied</th>
<th>1 - very dissatisfied</th>
</tr>
</thead>
</table>

22. Whom can you really count on to tell you, in a thoughtful manner, when you need to improve in some way?

<table>
<thead>
<tr>
<th>No one</th>
<th>1)</th>
<th>2)</th>
<th>3)</th>
<th>4)</th>
<th>5)</th>
<th>6)</th>
<th>7)</th>
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</tr>
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</table>

How satisfied?

<table>
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<th>4 - a little satisfied</th>
<th>3 - a little dissatisfied</th>
<th>2 - fairly dissatisfied</th>
<th>1 - very dissatisfied</th>
</tr>
</thead>
</table>

23. Whom can you really count on to help you feel better when you are feeling generally down-in-the-dumps?

<table>
<thead>
<tr>
<th>No one</th>
<th>1)</th>
<th>2)</th>
<th>3)</th>
<th>4)</th>
<th>5)</th>
<th>6)</th>
<th>7)</th>
<th>8)</th>
<th>9)</th>
</tr>
</thead>
</table>

How satisfied?

<table>
<thead>
<tr>
<th>6 - very satisfied</th>
<th>5 - fairly satisfied</th>
<th>4 - a little satisfied</th>
<th>3 - a little dissatisfied</th>
<th>2 - fairly dissatisfied</th>
<th>1 - very dissatisfied</th>
</tr>
</thead>
</table>

24. Whom do you feel truly loves you deeply?

<table>
<thead>
<tr>
<th>No one</th>
<th>1)</th>
<th>2)</th>
<th>3)</th>
<th>4)</th>
<th>5)</th>
<th>6)</th>
<th>7)</th>
<th>8)</th>
<th>9)</th>
</tr>
</thead>
</table>

How satisfied?

<table>
<thead>
<tr>
<th>6 - very satisfied</th>
<th>5 - fairly satisfied</th>
<th>4 - a little satisfied</th>
<th>3 - a little dissatisfied</th>
<th>2 - fairly dissatisfied</th>
<th>1 - very dissatisfied</th>
</tr>
</thead>
</table>
25. Whom can you count on to console you when you are very upset?

<table>
<thead>
<tr>
<th>No one</th>
<th>1)</th>
<th>2)</th>
<th>3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>How satisfied?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 - very satisfied</td>
<td>5 - fairly satisfied</td>
<td>4 - a little satisfied</td>
<td>3 - a little dissatisfied</td>
</tr>
</tbody>
</table>

26. Whom can you really count on to support you in major decisions you make?

<table>
<thead>
<tr>
<th>No one</th>
<th>1)</th>
<th>2)</th>
<th>3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>How satisfied?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 - very satisfied</td>
<td>5 - fairly satisfied</td>
<td>4 - a little satisfied</td>
<td>3 - a little dissatisfied</td>
</tr>
</tbody>
</table>

27. Whom can you really count on to help you feel better when you are very irritable, ready to get angry at almost anything?

<table>
<thead>
<tr>
<th>No one</th>
<th>1)</th>
<th>2)</th>
<th>3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>How satisfied?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 - very satisfied</td>
<td>5 - fairly satisfied</td>
<td>4 - a little satisfied</td>
<td>3 - a little dissatisfied</td>
</tr>
</tbody>
</table>

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TO SCORE SSQ:

1. Add total number of people for all 27 items. (Max. is 243).
   Divide by 27 for per item score. This gives you SSQ Number Score, or SSQN.
2. Total Satisfaction scores for all 27 items (Max. is 162).
   Divide by 27 for per item score. This gives you SSQ Satisfaction score or SSQS.
3. You can also add up total number of people that are family members and that can give the SSQ Family score.

Reference for reliability and validity of SSQ in addition to 1983 Sarason, Levine, Basham, and Sarason article:

APPENDIX H

SELF-EFFICACY QUESTIONNAIRE
PSYCHOSOCIAL DETERMINANTS OF SELF-CARE PRACTICES  
Self-Efficacy Questionnaire

After considering each activity listed below, rate how certain you are that you could perform each activity (if you decided to) in the next few months. Rate each item using the following scale: 4=strongly agree, 3=agree, 2=disagree, 1=strongly disagree. Circle the number which best describes how you feel about each item.

**Sugar Testing**

1. I could test my (urine or blood) sugar level at least once a week.
   - 4 strongly agree
   - 3 agree
   - 2 disagree
   - 1 strongly disagree

2. I could test my sugar level at least every other day.
   - 4 strongly agree
   - 3 agree
   - 2 disagree
   - 1 strongly disagree

3. I could test my sugar level at least once a day.
   - 4 strongly agree
   - 3 agree
   - 2 disagree
   - 1 strongly disagree

4. I could test my sugar level at least twice a day.
   - 4 strongly agree
   - 3 agree
   - 2 disagree
   - 1 strongly disagree

5. I could test my sugar level as instructed by my doctor.
   - 4 strongly agree
   - 3 agree
   - 2 disagree
   - 1 strongly disagree

6. I could test my sugar levels regularly when I'm at home.
   - 4 strongly agree
   - 3 agree
   - 2 disagree
   - 1 strongly disagree

7. I could test my sugar levels regularly at work.
   - 4 strongly agree
   - 3 agree
   - 2 disagree
   - 1 strongly disagree

8. I could test my sugar levels regularly while I am on trips away from home.
   - 4 strongly agree
   - 3 agree
   - 2 disagree
   - 1 strongly disagree
Exercise

9. I could exercise for at least 20 minutes once per week.
   4 strongly agree
   3 agree
   2 disagree
   1 strongly disagree

10. I could exercise for at least 20 minutes two times each week.
    4 strongly agree
    3 agree
    2 disagree
    1 strongly disagree

11. I could exercise for at least 20 minutes every other day.
    4 strongly agree
    3 agree
    2 disagree
    1 strongly disagree

12. I could exercise for at least 20 minutes a day.
    4 strongly agree
    3 agree
    2 disagree
    1 strongly disagree

13. I could do mild exercise (like walking) regularly.
    4 strongly agree
    3 agree
    2 disagree
    1 strongly disagree

14. I could do moderately strenuous exercise (like biking or walking quickly) regularly.
    4 strongly agree
    3 agree
    2 disagree
    1 strongly disagree

15. I could exercise by performing strenuous activities (like running, playing racquetball, or swimming) regularly.
    4 strongly agree
    3 agree
    2 disagree
    1 strongly disagree

16. I could regular exercise as instructed by my doctor.
    4 strongly agree
    3 agree
    2 disagree
    1 strongly disagree
Eating Habits

17. I could limit how many calories I eat as instructed by my doctor or nutritionist.
   4 strongly agree
   3 agree
   2 disagree
   1 strongly disagree

18. I could eat foods from the appropriate (exchange) food groups.
   4 strongly agree
   3 agree
   2 disagree
   1 strongly disagree

19. I could limit how many sweets and simple sugars (like bakery goods or candies I eat).
   4 strongly agree
   3 agree
   2 disagree
   1 strongly disagree

20. I could limit how many foods I eat that are high in fat and cholesterol.
   4 strongly agree
   3 agree
   2 disagree
   1 strongly disagree

21. I could limit the number of alcoholic drinks I have.
   4 strongly agree
   3 agree
   2 disagree
   1 strongly disagree

22. I could follow my diet when away from home (like when with friends or on vacation).
   4 strongly agree
   3 agree
   2 disagree
   1 strongly disagree

23. I could stick to my diet plan when at parties and social events.
   4 strongly agree
   3 agree
   2 disagree
   1 strongly disagree

24. I could follow my diet plan when eating at restaurants.
   4 strongly agree
   3 agree
   2 disagree
   1 strongly disagree

25. I could regularly eat foods high in fiber (like bran muffins, dried beans, or peas).
   4 strongly agree
   3 agree
   2 disagree
   1 strongly disagree
Medicine Taking (Mark NA if diabetes medicines have not been prescribed for you)

NA

26. I could regularly take my diabetes medicine (pills or insulin) as prescribed by my doctor.

4 strongly agree
3 agree
2 disagree
1 strongly disagree

27. I could take my diabetes medicine at the times I'm supposed to.

4 strongly agree
3 agree
2 disagree
1 strongly disagree

28. I could take my diabetes medicine regularly even when away from home.

4 strongly agree
3 agree
2 disagree
1 strongly disagree

29. I could adjust my level of diabetes medicine to changes in my activity (exercise) level.

4 strongly agree
3 agree
2 disagree
1 strongly disagree

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APPENDIX I

OUTCOME EXPECTANCY QUESTIONNAIRE
PSYCHOSOCIAL DETERMINANTS OF SELF-CARE PRACTICES
Outcome Expectancy Questionnaire

Indicate how much you agree or disagree with each of the following items. Rate each item using the following scale: 4=strongly disagree, 3=agree, 2=disagree, 1=strongly disagree. Circle the number which best describes how you feel about each item.

Sugar Testing

1. I will NOT feel any better if I test my sugar levels several times a day. 4 strongly agree
   3 agree
   2 disagree
   1 strongly disagree

2. If I test my sugar level daily, my diabetes will be better controlled. 4 strongly agree
   3 agree
   2 disagree
   1 strongly disagree

3. Testing my sugar level is unpleasant. 4 strongly agree
   3 agree
   2 disagree
   1 strongly disagree

4. Recording my sugar testing results is important for good control of my diabetes. 4 strongly agree
   3 agree
   2 disagree
   1 strongly disagree

135
## Exercise

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exercising will interfere with my daily schedule.</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Exercising regularly will make me feel healthier.</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Exercising regularly will reduce my chances of developing chronic health problems (like heart disease and stroke).</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>I will get sore if I exercise.</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
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</table>

## Eating Habits

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>My range of social activities will be limited if I follow my diet closely.</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>I will be healthier in the long run if I follow my diet.</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>I will feel deprived if I avoid some of my favorite foods.</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Following my diet plan will allow me to lose weight.</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>
Medicine Taking (Mark NA if diabetes medicines have not been prescribed for you)

NA _______

13. Taking my diabetes medicines regularly will make me feel better.  
   4 strongly agree  
   3 agree  
   2 disagree  
   1 strongly disagree

14. My diabetes medicine produces unpleasant side effects.  
   4 strongly agree  
   3 agree  
   2 disagree  
   1 strongly disagree

15. Taking my diabetes medicine consistently is necessary for good control of my diabetes.  
   4 strongly agree  
   3 agree  
   2 disagree  
   1 strongly disagree

16. Taking my diabetes medicine regularly will cost me a lot of money over the next few months.  
   4 strongly agree  
   3 agree  
   2 disagree  
   1 strongly disagree

Self-Care Activities

17. Doing my diabetes self-care activities (like sugar testing, following my diet, exercising, and taking my medicines) will help me to be in better control of my diabetes.  
   4 strongly agree  
   3 agree  
   2 disagree  
   1 strongly disagree

18. Doing my diabetes self-care activities will make little difference in how I feel each day.  
   4 strongly agree  
   3 agree  
   2 disagree  
   1 strongly disagree

   4 strongly agree  
   3 agree  
   2 disagree  
   1 strongly disagree

20. Completing all of my diabetes self-care activities takes a large share of day that I could devote to other things.  
   4 strongly agree  
   3 agree  
   2 disagree  
   1 strongly disagree

Modified with permission of the author.
APPENDIX J

DIABETES ACTIVITIES QUESTIONNAIRE
THE DIABETES ACTIVITIES QUESTIONNAIRE

The questions below will ask you about your personal experience with diabetes. Each question is designed to find out about your experience with the activities related to your diabetes. Remember that the word educator can refer to any member of the health care team (doctor, dietitian, nurse, exercise therapist, etc.). For each of the questions below, rate each item using the following scale: 4=always, 3=sometimes, 2=never, 1=not applicable. Circle the number which best describes how you feel about each item.

1. I follow my meal plan exactly as suggested by my dietitian.
   4 always
   3 sometimes
   2 never
   1 not applicable

2. I try to keep my weight within the range suggested by my educator.
   4 always
   3 sometimes
   2 never
   1 not applicable

3. I exercise as often as my educator advised me to.
   4 always
   3 sometimes
   2 never
   1 not applicable

4. I only do exercises/activities recommended by my educator.
   4 always
   3 sometimes
   2 never
   1 not applicable

5. I exercise at the times suggested by my educator.
   4 always
   3 sometimes
   2 never
   1 not applicable

6. Each day I take exactly the number of injections/pills prescribed by my doctor.
   4 always
   3 sometimes
   2 never
   1 not applicable

7. I take insulin/pills at the times prescribed by my educator.
   4 always
   3 sometimes
   2 never
   1 not applicable

8. I only adjust the dose of my insulin/pills if my educator tells me to.
   4 always
   3 sometimes
   2 never
   1 not applicable
9. I test my blood sugar as often as suggested by my educator.

   4 always
   3 sometimes
   2 never
   1 not applicable

10. I test my blood sugar at the times suggested by my educator.

    4 always
    3 sometimes
    2 never
    1 not applicable

11. I treat low blood sugar reactions with the type of food/drink/candy advised by my educator.

    4 always
    3 sometimes
    2 never
    1 not applicable

12. When I have a reaction I only eat/drink the amount suggested by my educator.

    4 always
    3 sometimes
    2 never
    1 not applicable

13. I examine my feet daily.

    4 always
    3 sometimes
    2 never
    1 not applicable

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APPENDIX K

THANK-YOU LETTER
June 12, 2001

Dear Diabetes Patient,

Thank you for your participation in the study titled, "Impact of Social Support, Self-Efficacy, and Outcome Expectations on Self-Care Behaviors and Glycemic Control in Caucasian and African-American Adults with Type 2 Diabetes Mellitus." You will receive a $5.00 incentive in the mail in appreciation of your time and effort.

At the time of your four-month follow-up diabetes outpatient clinic visit, you will be again asked to answer the same forms that you've just completed. In appreciation of your time and effort, you will received another $5.00 incentive in the mail.

Again, thank you for your participation in this study. Because of your time we hope to be able to better help persons with diabetes. If you have any questions about this study, feel free to call me at (859) 257-4204.

Sincerely,

Bonnie J. Garvin, PhD, RN
Principal Investigator
Associate Professor and Chair, The Ohio State University

Diane Ortebo, PhD(s), MS, MA, RN
Co-Investigator
Doctoral Candidate, The Ohio State University
APPENDIX L

KENTUCKY CLINIC APPROVAL LETTER
April 30, 2001

To Whom It May Concern:

I am fully aware of the research study being conducted by Diane Orr Chlebowy, PhD (c), RN and support that data collection occur at the Kentucky Clinic. Patients with type 2 diabetes mellitus who are seen in the Medicine Clinic at the Kentucky Clinic will be potential subjects in this study.

Sincerely,

Dennis Karounos, MD

DC/kb
Karounos
5/2/01
APPENDIX M

CONSENT FORM FOR USE AT THE KENTUCKY CLINIC
CONSENT TO PARTICIPATE IN STUDY

IMPACT OF SOCIAL SUPPORT, SELF-EFFICACY, AND OUTCOME EXPECTATIONS ON SELF-CARE BEHAVIORS AND GLYCEMIC CONTROL IN CAUCASIAN AND AFRICAN-AMERICAN ADULTS WITH TYPE 2 DIABETES MELLITUS

WHY AM I BEING INVITED TO TAKE PART IN THIS RESEARCH?

You are being invited to take part in this research study about the different things that may affect diabetes behaviors and blood sugar control in persons with diabetes. You are being invited to take part in this research study because you have type 2 diabetes. If you volunteer to take part in this study, you will be one of about 120 people to do so.

WHO IS DOING THE STUDY?

The person in charge of this study is Diane Orr Chlebowy, PhD (c), MS, MA, RN. She is guided in this research by Bonnie Garvin, PhD, RN, her advisor at The Ohio State University College of Nursing.

WHAT IS THE PURPOSE OF THIS STUDY?

The purpose of this study is to look at the different things that may affect diabetes behaviors and blood sugar control in persons with type 2 diabetes. The study will also assist healthcare persons to look at ways in which teaching can help those with diabetes.

WHERE IS THE STUDY GOING TO TAKE PLACE AND HOW LONG WILL IT LAST?

The research study will be conducted in the Medicine Clinic at the Kentucky Clinic. You will complete four forms at the time of your initial diabetes outpatient clinic visit. The total amount of time you will be used to answer all of the forms will be about 45 minutes. Four months after your initial visit, you will again be asked to complete the same forms which will take about 45 minutes to complete.

WHAT WILL I BE ASKED TO DO?

At the time of your initial clinic visit, you will be asked to answer four forms about your feelings, beliefs, and usual behaviors. It will take you about 45 minutes to complete these forms. You will receive a $5.00 incentive in appreciation for your time and effort. At the time of your four-month follow-up visit, you will again be asked to answer these same forms. It will again take you about 45 minutes to complete these forms and you will receive another $5.00 incentive for your time and effort. As part of the study, your blood sugar values and some information about you will be obtained from your medical record.
ARE THERE REASONS WHY I SHOULD NOT TAKE PART IN THIS STUDY?

There are no reasons why a person should not take part in this study.

WHAT ARE THE POSSIBLE RISKS AND DISCOMFORTS?

There are minimal psychological risks associated with this study. When completing one form, you will be asked to share some personal feelings regarding your social support. This may cause you to feel some sadness if you lack such support.

WILL I BENEFIT FROM TAKING PART IN THIS STUDY?

There is no guarantee that you will get any benefit from taking part in this study. However, some people may find it helpful to look at their feelings, beliefs, and usual behaviors regarding their diabetes management. We cannot and do not guarantee that you will receive any benefits from taking part in this study.

DO I HAVE TO TAKE PART IN THE STUDY?

If you decide to take part in the study, it should be because you really want to volunteer. You will not lose any benefits or rights you would normally have if you choose not to volunteer. You can stop at any time during the study and still keep the benefits and rights you had before volunteering. If you decide not to take part in the study, your decision will have no effect on the quality of medical care you receive.

If you decide to take part in the study you still have the right to decide at any time that you no longer want to continue. You will not be treated differently if you decide to stop taking part in the study.

IF I DON'T WANT TO TAKE PART IN THE STUDY, ARE THERE OTHER CHOICES?

If you do not want to be in the study, there are no other choices except not to take part in the study.

WHAT WILL IT COST ME TO PARTICIPATE?

You and/or your insurance company, Medicare, or Medicaid will be responsible for the costs of care and treatment you receive during this study that you would normally receive for your condition. There are costs that are considered medically reasonable and necessary and will be part of the care you receive even if you do not take part in this study.
WHO WILL SEE THE INFORMATION THAT I GIVE?

We will keep private all research records that identify you to the extent allowed by law.

Your information will be combined with information from other people taking part in the study. When we write about the study to share it with other researchers, we will write about the combined information we have gathered. You will not be identified in these written materials. We may publish the results of this study; however, we will keep your name and other identifying information private.

We make every effort to prevent anyone who is not on the research team from knowing that you gave us information, or what that information is. For example, your name will be kept separate from the information you give, and these two things will be stored in different places in the principal investigator's office under lock and key.

WHAT HAPPENS IF I GET HURT OR SICK DURING THE STUDY?

If you believe you are hurt or if you get sick because of something that is done during the study, you should call Diane Orr Chlebowy at 859-257-4204 immediately. It is important for you to understand that the University of Kentucky will not pay for the cost of any medical care or treatment that might be necessary because you get hurt or sick while taking part in the study. That cost will be your responsibility. Your health care insurer (Medicare, Medicaid, private insurer) may or may not cover these costs. However, any questions you have about this should be directed to your insurer. Also, the University of Kentucky will not pay for any wages you may lose if you are harmed by this study.

Usually, medical costs that result from research-related harm cannot be included as regular medical costs. The University of Kentucky is not allowed to bill your insurance company, Medicare, or Medicaid for these costs without first getting permission. You should ask your insurer if you have any questions about your insurer's willingness to pay under these circumstances. Therefore, the costs related to your care and treatment because of something that is done during the study will be your responsibility.

If you are eligible for Veterans Affairs medical benefits, the VA may provide medical care if you get hurt or get sick as a result of taking part in this study.

WILL I RECEIVE ANY REWARDS FOR TAKING PART IN THIS STUDY?

At your initial clinic visit, you will receive a $5.00 incentive after you have completed the forms. At the time of your four-month follow-up visit, you will again receive another $5.00 incentive after completion of the forms. Your willingness to take part, however, may, in the future, help health care persons better understand and/or treat others who have diabetes.
WHAT IF I HAVE QUESTIONS?

Before you decide whether to accept this invitation to take part in this study, please ask any questions that might come to mind now. Later, if you have questions about the study, you can contact the principal investigator, Diane Orr Chlebowy at 859-257-4204 (office phone) or 859-260-8934 (pager). If you have any questions about your rights as a volunteer in this research, contact the staff in the Office of Research Integrity at the University of Kentucky at 859-257-3138.

We will give you a copy of this consent form to take with you.

WHAT ELSE DO I NEED TO KNOW?

American Association of Diabetes Educators is providing financial support and/or material for this study.

You will be told if any new information is learned which may affect your condition or influence your willingness to continue taking part in this study.

______________________________  _______________________
Signature of person agreeing to take part in the study                  Date

______________________________
Printed name of person taking part in the study

______________________________
Name of person providing information to the subject

______________________________
Signature of Investigator
APPENDIX N

W-9 FORM
Form W-9

Request for Taxpayer Identification Number and Certification

Give form to the requester. Do not send to the IRS.

Name (See Specific Instructions on page 2)

Business name, if different from above. (See Specific Instructions on page 2)

Check appropriate box: □ Individual/Sole proprietor □ Corporation □ Partnership □ Other □

Address (number, street, and apt. or suite no.)

City, state, and ZIP code

Requestor's name and address (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. For individuals, this is your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the Part I instructions on page 2. For other entities, it is your employer identification number (EIN). If you do not have a number, see How to get a TIN on page 2.

Notes: If the account is in more than one name, see the chart on page 2 for guidelines on whose number to enter.

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me), and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding,
3. I am a U.S. person (including a U.S. resident alien).

Certification Instructions. You must cross out Item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, Item 3 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the Certification, but you must provide your correct TIN. (See the instructions on page 2.)

Sign Here

Signature of U.S. person

Date

Purpose of Form

A person who is required to file an information return with the IRS must get your correct taxpayer identification number (TIN) to report, for example, income paid to you, real estate transactions, mortgage interest you paid, acquisition or abandonment of secured property, cancellation of debt, or contributions you made to an IRA.

Use Form W-9 only if you are a U.S. person (including a resident alien). To give your correct TIN to the person requesting it (the requester) and, when applicable, to:

1. Certify the TIN you are giving is correct (or you are waiting for a number to be issued),
2. Certify you are not subject to backup withholding, or
3. Claim exemption from backup withholding if you are a U.S. exempt payee.

If you are a foreign person, use the appropriate Form W-8. See Pub. 918, Withholding of Tax on Nonresident Aliens and Foreign Corporations.

Notes: If a requester gives you a form other than Form W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9.

What is backup withholding? Persons making certain payments to you must withhold and pay to the IRS 31% of such payments under certain conditions. This is called "backup withholding." Payments that may be subject to backup withholding include interest, dividends, broker and barter exchange transactions, rents, royalties, nonemployee pay, and certain payments from fishing boat operators. Real estate transactions are not subject to backup withholding.

If you give the requester your correct TIN, make the proper certifications, and report all your taxable interest and dividends on your tax return, payments you receive will not be subject to backup withholding. Payments you receive will be subject to backup withholding if:

1. Your TIN is incorrect or not furnished to the requester, or
2. You do not certify your TIN when required (see the Part II instructions on page 2 for details), or
3. An IRS notifies the requester that you furnished an incorrect TIN, or
4. The IRS tells you that you are subject to backup withholding because you did not report all your interest and dividends on your tax return (for reportable interest and dividends only), or
5. You do not certify to the requester that you are not subject to backup withholding under 4 above (for reportable interest and dividend accounts opened after 1963 only). Certain payees and payments are exempt from backup withholding. See Part II instructions and the separate Instructions for the Requesters of Form W-8.

Penalties

Failure to furnish TIN. If you fail to furnish your correct TIN to a requester, you are subject to a penalty of $50 for each such failure unless your failure is due to reasonable cause and not to willful neglect.

Civil penalty for false information with respect to withholding. If you make a false statement with no reasonable basis that results in no backup withholding, you are subject to a $500 penalty.

Criminal penalty for falsifying information. Willfully falsifying certifications or affirmations may subject you to criminal penalties including fines and/or imprisonment.

Misuse of TINs. If the requester discloses or uses TINs in violation of Federal law, the requester may be subject to civil and criminal penalties.

Cat. No. 10231X

Form W-9 (Rev. 12-2000)

151
Specific Instructions

Name. If you are an individual, you must generally enter the name shown on your social security card. However, if you have changed your last name, for instance, due to marriage without informing the Social Security Administration of the name change, enter your first name, the last name shown on your social security card, and your new last name.

If the account is in joint names, list each and then circle the name of the person or entity whose number you enter in Part I of the form.

Sole proprietor. Enter your individual name or the name of the business as DBA (Doing Business As) name on the “Name” line. You may enter your business, trade, or “doing business as” business name of the “Business name” line.

Limited liability company (LLC). If you are a single-member LLC (including a foreign LLC with a domestic owner) that is disregarded as an entity separate from its owner under Treasury regulations section 301.7701-3, enter the owner’s name on the “Name” line. Enter the LLC’s name on the “Business name” line.

Caution: A disregarded domestic entity that has a foreign owner must use the appropriate Form W-8-M.

Other entities. Enter your business name as it is shown on the federal tax documents or on the “Name” line. This name must be the same name that is shown on the charter or legal document creating the entity. You must enter any business, trade, or DBA name on the “Business name” line.

Part I—Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box.

If you are a resident alien and you do not have and are not eligible to get an SSN, your TIN is your IRS individual taxpayer identification number (ITIN). Enter it in the social security number box. If you do not have an ITIN, see how to get a TIN below.

If you are a sole proprietor and you have an EIN, you may enter either your SSN or EIN. However, the IRS prefers that you use your SSN.

If you are an LLC that is disregarded as an entity separate from its owner (see Limited Liability Company, LLC, above) and owned by an individual, enter your SSN for “pre-LLC” EIN, if desired. If the owner of a disregarded LLC (or corporation, partnership, etc.) enters the owner’s EIN.

Note: See the chart on this page for further identification of name and TIN combinations.

How to get a TIN

If you do not have a TIN, you may apply for one immediately. To apply for an SSN, get Form SS-5, Application for a Social Security Card, from your local Social Security Administration office. Get Form W-7, Application for IRS Individual Taxpayer Identification Number, to apply for ITIN. You can get Forms W-7 and SS-5 from the IRS by calling 1-800-TAX-FORM (1-800-829-3676) or from the IRS’s Internet Web site.

If you do not have a TIN, write “Applied For” in the space for the TIN, sign and date the form, and give it to the requester. For interest and dividend payments and certain payments made with respect to readily tradable instruments, generally you will have 60 days to get a TIN and give it to the requester before you are subject to backup withholding on payments. The 60-day rule does not apply to other types of payments. You will be subject to backup withholding on all such payments until you provide your TIN to the requester.

Note: Writing “Applied For” means that you have already applied for a TIN or that you intend to apply for one soon.

Part II—For U.S. Payees Exempt From Backup Withholding

Individuals (including sole proprietors) are not exempt from backup withholding. Corporations are exempt from backup withholding for certain payments, such as interest and dividends. For more information on exempt payees, see the separate Instructions for the Requester of Form W-8.

If you are exempt from backup withholding, you should still complete this form to avoid possible erroneous backup withholding. Enter your EIN in Part II, and sign and date the form.

If you are a nonresident alien or a foreign entity not subject to backup withholding, give the requester the appropriate completed Form W-8.

Part III—Certification

To establish to the withholding agent that you are a U.S. person, or resident alien, sign Form W-8. You may be requested to sign by the withholding agent even if items 1, 3, and 5 below indicate otherwise.

For a joint account, only the person whose TIN is shown in Part I should sign (when required).

1. Interest, dividend, and barter exchange accounts opened before 1984 and broker accounts considered active during 1983. You must give your correct TIN, but you do not have to sign the certification.

2. Interest, dividend, broker, and barter exchange accounts opened after 1983 and broker accounts considered inactive during 1983. You must sign the certification or backup withholding will apply. If you are subject to backup withholding and you are merely providing your correct TIN to the requester, you must cross out Item 2 in the certification before signing the form.

3. Real estate transactions. You must sign the certification. You may cross out item 2 of the certification.

4. Other payments. You must give your correct TIN, but you do not have to sign the certification unless you have previously given an incorrect TIN. "Other payments" include payments made in the course of the requester’s trade or business for rents, royalties, goods (other than buildings for merchandise), medical, and health care services (including payments to corporations), payments to a nonemployee for services, payments to certain fishing boat crew members and fishermen, and gross proceeds paid to attorneys (including payments to corporations).

5. Mortgage Interest paid to you, acquisition or abandonment of secured property, cancellation of debt, qualified tuition payments made by IRA, excess MSA contributions or distributions, and pension distributions. You must give your correct TIN, but you do not have to sign the certification.

Privacy Act Notice

Section 6109 of the Internal Revenue Code requires you to give your correct TIN to persons who must file information returns with the IRS to report interest, dividends, and certain other income paid to you, mortgage interest paid, the acquisition or abandonment of secured property, cancellation of debt, or contributions you made to an IRA or MSA. The IRS uses the numbers for identification purposes and to help verify the accuracy of your tax return. The IRS may also provide this information to the Department of Justice for civil and criminal litigation, and to cities, states, and the District of Columbia to carry out their tax laws.

You must provide your TIN whether or not you are required to file a tax return. Payments must generally withhold 31% of taxable interest, dividends, and certain other payments to a payee who does not give a TIN to a payer. Certain penalties may also apply.

What Name and Number To Give the Requester

For this type of account:

Give name and SSN of:

1. Individual

The individual or the owner of the account or, if combined funds, the first individual on the account.

2. Two or more individuals (joint account)

The actual owner of the account or, if combined funds, the first individual on the account.

3. Custodian account of a minor (Uniform Gift to Minors Act)

The grantor-trustee.

4. a. The usual revocable savings trust (grantor is also trustee)

The actual owner.

b. So-called trust account that has not a legal or valid trust under state law

The owner.

5. Sole proprietorship

The owner.

For this type of account:

Give name and EIN of:

6. Sole proprietorship

The owner

7. A valid trust, estate, or pension trust

Legal entity

8. Corporation

The corporation

9. Association, club, religious, charitable, educational, or other tax-exempt organization

The organization

10. Partnership

The partnership

11. A broker or registered nominee

The broker or nominee

12. Accounts with the Department of Agriculture in the name of a public entity (such as a state, county, school district, or political unit) that are statutory program payments

The public entity

1. List first and circle the name of the person whose number you furnish. If only one person on a joint account has an SSN, that person’s number must be furnished.

2. Circle the minor’s name and furnish the minor’s SSN.

3. You must show your individual name, but you may also enter your business or "DBA" name. You may use either your SSN or EIN (if you have one).

4. List first and circle the name of the legal trust, estate, or pension trust. Do not furnish the TIN of the personal representative or trustee unless the legal entity itself is not designated in the account title.

Note: If no name is circled when more than one name is listed, the number will be considered to be that of the first name listed.
APPENDIX O

GENERAL INFORMATION FORM
NOTICE OF PAYMENT

__________________________________________ will receive $5 for participation in the study entitled:

Impact of Social Support, Self-Efficacy, and Outcome Expectations on Self-Care Behaviors and Glycemic Control in Caucasian and African-American Adults with Type 2 Diabetes Mellitus

Subject Signature _____________________________ Date _____________________________

Social Security Number _____________________________

Address _________________________________________

Study Representative _____________________________

154
APPENDIX P

LEXINGTON-FAYETTE COUNTY HEALTH DEPARTMENT APPROVAL LETTER
August 22, 2001

Ms. Diane Chlebowy, MS, MA, RN
Nursing Administration
315 Health Science Learning Center
University of Kentucky
Lexington, Kentucky 40506-0232

Dear Ms. Chlebowy,

We have received a copy of the University of Kentucky Institutional Review Board’s approval of your research project protocols number 01-0378-P2R.

The research project, “Caucasian and African-American Adults with Type 2 Diabetes Mellitus” has potential to assist our community in its efforts to provide support to individuals with type 2 Diabetes.

If there are any changes in the research project or protocols, we will expect notification immediately.

Ms. Maryann Myre, Deputy Commissioner for Nutrition and Health Education, will assist you while you are at the Lexington - Fayette County Health Department.

Sincerely,

[Signature]

John Poundstone MD, MPH
Commissioner
Chairman, Human Subjects Review Committee
APPENDIX Q

CONSENT FORM FOR USE AT THE

LEXINGTON-FAYETTE COUNTY HEALTH DEPARTMENT
CONSENT TO PARTICIPATE IN STUDY

IMPACT OF SOCIAL SUPPORT, SELF-EFFICACY, AND OUTCOME EXPECTATIONS ON SELF-CARE BEHAVIORS AND GLYCEMIC CONTROL IN CAUCASIAN AND AFRICAN-AMERICAN ADULTS WITH TYPE 2 DIABETES MELLITUS

WHY AM I BEING INVITED TO TAKE PART IN THIS RESEARCH?

You are being invited to take part in this research study about the different things that may affect diabetes behaviors and blood sugar control in persons with diabetes. You are being invited to take part in this research study because you have type 2 diabetes. If you volunteer to take part in this study, you will be one of about 120 people to do so.

WHO IS DOING THE STUDY?

The person in charge of this study is Diane Orr Chlebowy, PhD (c), MS, MA, RN. She is guided in this research by Bonnie Garvin, PhD, RN, her advisor at The Ohio State University College of Nursing.

WHAT IS THE PURPOSE OF THIS STUDY?

The purpose of this study is to look at the different things that may affect diabetes behaviors and blood sugar control in persons with type 2 diabetes. The study will also assist health care persons to look at ways in which teaching can help those with diabetes.

WHERE IS THE STUDY GOING TO TAKE PLACE AND HOW LONG WILL IT LAST?

The research study will be conducted at the Lexington-Fayette County Health Department. You will complete four forms at the time of your initial diabetes outpatient clinic visit. The total amount of time you will be need to answer all of the forms will be about 45 minutes. Four months after your initial visit, you will again be asked to complete the same forms which will take about 45 minutes to complete.

WHAT WILL I BE ASKED TO DO?

At the time of your initial clinic visit, you will be asked to answer four forms about your feelings, beliefs, and usual behaviors. It will take you about 45 minutes to complete these forms. You will receive a $5.00 incentive in appreciation for your time and effort. At the time of your four-month follow-up visit, you will again be asked to answer these same forms. It will again take you about 45 minutes to complete these forms and you will receive another $5.00 incentive for your time and effort. As part of the study, your blood sugar values and some information about you will be obtained from your medical record.
ARE THERE REASONS WHY I SHOULD NOT TAKE PART IN THIS STUDY?

There are no reasons why a person should not take part in this study.

WHAT ARE THE POSSIBLE RISKS AND DISCOMFORTS?

There are minimal psychological risks associated with this study. When completing one form, you will be asked to share some personal feelings regarding your social support. This may cause you to feel some sadness if you lack such support.

WILL I BENEFIT FROM TAKING PART IN THIS STUDY?

There is no guarantee that you will get any benefit from taking part in this study. However, some people may find it helpful to look at their feelings, beliefs, and usual behaviors regarding their diabetes management. We cannot and do not guarantee that you will receive any benefits from taking part in this study.

DO I HAVE TO TAKE PART IN THE STUDY?

If you decide to take part in the study, it should be because you really want to volunteer. You will not lose any benefits or rights you would normally have if you choose not to volunteer. You can stop at any time during the study and still keep the benefits and rights you had before volunteering. If you decide not to take part in the study, your decision will have no effect on the quality of medical care you receive.

If you decide to take part in the study you still have the right to decide at any time that you no longer want to continue. You will not be treated differently if you decide to stop taking part in the study.

IF I DON'T WANT TO TAKE PART IN THE STUDY, ARE THERE OTHER CHOICES?

If you do not want to be in the study, there are no other choices except not to take part in the study.

WHAT WILL IT COST ME TO PARTICIPATE?

You and/or your insurance company, Medicare, or Medicaid will be responsible for the costs of care and treatment you receive during this study that you would normally receive for your condition. There are costs that are considered medically reasonable and necessary and will be part of the care you receive even if you do not take part in this study.
WHO WILL SEE THE INFORMATION THAT I GIVE?

We will keep private all research records that identify you to the extent allowed by law.

Your information will be combined with information from other people taking part in the study. When we write about the study to share it with other researchers, we will write about the combined information we have gathered. You will not be identified in these written materials. We may publish the results of this study; however, we will keep your name and other identifying information private.

We make every effort to prevent anyone who is not on the research team from knowing that you gave us information, or what that information is. For example, your name will be kept separate from the information you give, and these two things will be stored in different places in the principal investigator’s office under lock and key.

WHAT HAPPENS IF I GET HURT OR SICK DURING THE STUDY?

If you believe you are hurt or if you get sick because of something that is done during the study, you should call Diane Orr Chlebowy at 859-257-4204 immediately. It is important for you to understand that the University of Kentucky will not pay for the cost of any medical care or treatment that might be necessary because you get hurt or sick while taking part in the study. That cost will be your responsibility. Your health care insurer (Medicare, Medicaid, private insurer) may or may not cover these costs. However, any questions you have about this should be directed to your insurer. Also, the University of Kentucky will not pay for any wages you may lose if you are harmed by this study.

Usually, medical costs that result from research-related harm can not be included as regular medical costs. The University of Kentucky is not allowed to bill your insurance company, Medicare, or Medicaid for these costs without first getting permission. You should ask your insurer if you have any questions about your insurer’s willingness to pay under these circumstances. Therefore, the costs related to your care and treatment because of something that is done during the study will be your responsibility.

If you are eligible for Veterans Affairs medical benefits, the VA may provide medical care if you get hurt or get sick as a result of taking part in this study.

WILL I RECEIVE ANY REWARDS FOR TAKING PART IN THIS STUDY?

At your initial clinic visit, you will receive a $5.00 incentive after you have completed the forms. At the time of your four-month follow-up visit, you will again receive another $5.00 incentive after completion of the forms. Your willingness to take part, however, may, in the future, help health care persons better understand and/or treat others who have diabetes.
WHAT IF I HAVE QUESTIONS?

Before you decide whether to accept this invitation to take part in this study, please ask any questions that might come to mind now. Later, if you have questions about the study, you can contact the principal investigator, Diane Orr Chlebowy at 859-257-4204 (office phone) or 859-260-0934 (pager). If you have any questions about your rights as a volunteer in this research, contact the staff in the Office of Research Integrity at the University of Kentucky at 859-257-3138.

We will give you a copy of this consent form to take with you.

WHAT ELSE DO I NEED TO KNOW?

American Association of Diabetes Educators is providing financial support and/or material for this study.

You will be told if any new information is learned which may affect your condition or influence your willingness to continue taking part in this study.

__________________________  _______________________
Signature of person agreeing to take part in the study    Date

__________________________
Printed name of person taking part in the study

__________________________
Name of person providing information to the subject

__________________________
Signature of Investigator
APPENDIX R

DIABETES CLASS SCHEDULE
DIABETES MANAGEMENT SEMINAR
JEWISH HOSPITAL

DAY I

9:00 - 9:10 Welcome
RN

9:10 - 9:50 General Nutrition
RD General Principles for Blood Sugar Control

9:50 - 10:00 Break

10:00 - 10:50 What is Diabetes?
MD Signs and Symptoms
Diagnosing Diabetes
Risk Factors
Incidence of Diabetes
Classification

10:50 - 11:00 Break

11:00 - 11:50 Treating /Controlling Diabetes
MD Target Blood Sugar Levels
Variables that Affect Blood Sugar Levels

12:00 - 12:45 Lunch

12:45 - 1:50 Behavior Modification
RD Label Reading
Portion Control

1:50 - 2:00 Break

2:00 - 2:50 Dining out
RD Cookbooks and Nutritional Resources

2:50 - 3:30 Sick Days
RD Dealing with High /Low Blood Sugars
Identification for those with Diabetes
DAY II

8:30 – 9:00
RN
Coping with Diabetes

9:00 – 9:30
RN
Medications

9:30 – 10:00
RN
Foot, Skin and Dental Care

10:00 – 10:50
MD
Acute Complications (prevention / detection / treatment)
Over the Counter Drugs

10:50 – 11:00
Break

11:00 – 11:50
MD
Chronic Complications (prevention / detection / treatment)
DCCT

11:50 – 12:45
Lunch

12:45 – 1:35
Exercise Physiologist
Diabetes and Exercise

1:35 – 1:45
Break

1:45 – 2:30
RN/RD
Goal Setting

2:30 – 3:00
RN
Use of Health Care System and Community Resources
Practical Problem Solving
Evaluation
June 17, 1998

Diane Orr Chlebowy
4809 Matthew Court
Lexington, KY 40514

Dear Dr. Chlebowy

You have my permission to use the Social Support Questionnaire, in either its short or long form, in your research. If you do decide to use one of these questionnaires, I request that you share with me your results relevant to social support.

Best of luck in your research endeavors.

Sincerely,

Barbara R. Sarason, Ph.D.
Research Professor
APPENDIX T

AUTHOR (TOOBERT) PERMISSION LETTER
Deborah Toobert, 09:59 AM 5/8/02 -, RE: Permission for Instrument

X-Auth-Name:
From: Deborah Toobert <Deborah@ori.org>
To: "Diane Orr Chlebowy" <docchle0@pop.uky.edu>
Subject: RE: Permission for Instrument Usage
Date: Wed, 8 May 2002 09:59:18 -0700
X-Mailer: Internet Mail Service (5.5.2653.19)

You are welcome to and modify the instruments you list below. Good luck with your research.

Deborah J. Toobert, PhD
Research Scientist
Oregon Research Institute
1715 Franklin Blvd.
Eugene, Oregon 97405

Phone: (541) 485-2123
Fax: (541) 434-1502
Email: deborah@ori.org

-----Original Message-----
From: Diane Orr Chlebowy [mailto:docchle0@pop.uky.edu]
Sent: Wednesday, May 08, 2002 9:14 AM
To: deborah@ori.org
Subject: Permission for Instrument Usage

Dr. Toobert, a few years ago I requested and received permission to use and modify the Self-Efficacy Questionnaire and the Outcome Expectancy Questionnaire. Unfortunately, your letter granting permission has been misfiled. Would you please send via email a short note granting your permission to use these two questionnaires? Thank you very much for your time. Diane Orr Chlebowy, PhD Candidate, RN

Printed for Diane Orr Chlebowy <docchle0@pop.uky.edu>
APPENDIX U

ORIGINAL SELF-EFFICACY QUESTIONNAIRE
PSYCHOSOCIAL DETERMINANTS OF SELF-CARE PRACTICES
Self-Efficacy Questionnaire

After considering the difficulty of each activity listed below, rate how certain you are that you realistically could perform each activity (if you decided to) over the next several months. Select ANY NUMBER between -100 and +100 that best represents how you feel using the scale below.

<table>
<thead>
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<th>-100</th>
<th>-50</th>
<th>0</th>
<th>+50</th>
<th>+100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completely certain that I could not</td>
<td>Moderately certain that I could not</td>
<td>Quite uncertain as whether I could or not</td>
<td>Moderately certain that I could</td>
<td>Completely certain that I could</td>
</tr>
</tbody>
</table>

Glucose Testing

1. I could test my (urine or blood) glucose level at least once a week over the next several months. __________

2. I could test my glucose level at least every other day. __________

3. I could test my glucose level at least once a day. __________

4. I could test my glucose level at least twice a day. __________

5. I could test my glucose level as instructed by my physician over the next several months. __________

6. I could test my glucose levels regularly when I'm at home. __________

7. I could test my glucose levels regularly at work. __________

8. I could test my glucose levels regularly while I am on trips away from home. __________

Permission to reprint: (pending)
<table>
<thead>
<tr>
<th>-100</th>
<th>-50</th>
<th>0</th>
<th>+50</th>
<th>+100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completely certain that I could not</td>
<td>Moderately certain that I could not</td>
<td>Quite uncertain as whether I could or not</td>
<td>Moderately certain that I could</td>
<td>Completely certain that I could</td>
</tr>
</tbody>
</table>

**Certainty Rating**
(-100 to +100)

**Exercise**

9. I could exercise for at least 20 minutes once per week over the next several months.

10. I could exercise for at least 20 minutes 2 times each week.

11. I could exercise for at least 20 minutes every other day.

12. I could exercise for at least 20 minutes a day.

13. I could engage in mild exercise (like walking) regularly over the next several months.

14. I could engage in moderately strenuous exercise (like biking or walking briskly) regularly.

15. I could exercise by performing strenuous activities (like running, playing racquetball, or swimming) regularly.

16. I could regularly exercise as instructed by my physician over the next several months.

**Eating Habits**

17. I could limit how many calories I eat as instructed by my physician or nutritionist over the next several months.

18. I could eat foods from the appropriate (exchange) food groups.

19. I could limit how many sweets and simple sugars (e.g., bakery goods, candies) I eat.
<table>
<thead>
<tr>
<th>Certainty Rating (100 to -100)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-100</td>
</tr>
<tr>
<td>Completely certain that I could not</td>
</tr>
</tbody>
</table>

**Eating Habits (Continued)**

20. I could limit how many foods I eat that are high in fat and cholesterol.

21. I could limit the number of alcoholic beverages I drink.

22. I could follow my diet when away from home over the next several months (e.g., at friends, on vacation).

23. I could stick to my diet plan when at parties and social events.

24. I could follow my diet plan when eating at restaurants.

25. I could regularly eat foods high in dietary fiber (e.g., bran muffins, dried beans, peas).

**Medication Taking (Please circle "-8" if you’re not prescribed diabetes medication)**

26. I could regularly take my diabetes medication (insulin or pills) as prescribed by my physician over the next several months.

27. I could take my diabetes medication at the times I’m supposed to over the next several months.

28. I could take my diabetes medication regularly even when away from home.

29. I could adjust my level of diabetes medication to changes in my activity (exercise) level.
Subject I.D. Number: ________
Date: ________________

PSYCHOSOCIAL DETERMINANTS OF SELF-CARE PRACTICES
Outcome Expectancy Questionnaire

Please indicate how much you agree or disagree with each of the following statements. Rate your agreement by choosing ANY NUMBER from 0 to 100 using the scale below as a guide.

<table>
<thead>
<tr>
<th>Rating</th>
<th>0</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>70</th>
<th>80</th>
<th>90</th>
<th>100</th>
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<tbody>
<tr>
<td>Agree</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neither Agree Nor Disagree</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Disagree</td>
<td></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Totally Agree</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Totally Disagree</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Adhering to my diabetes self-care activities (glucose testing, following my diet, exercising, and taking my medication) will improve my control of my diabetes. ______

2. I will NOT feel any better if I test my glucose levels several times a day. ______

3. Exercising will disrupt my daily schedule. ______

4. Taking my diabetes medication regularly will make me feel better. ______

5. My range of social activities will be limited if I follow my diet closely. ______

6. If I test my glucose level daily, my diabetes will be better controlled. ______

7. Adhering to my self-care activities will make little difference in how I feel each day. ______

8. My diabetes medication produces unpleasant side effects. ______

9. Exercising regularly will make me feel healthier. ______

10. I will be healthier in the long run if I follow my diet. ______

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(pending) North Dakota State University

174
11. By adhering to my diabetes self-care activities, I will greatly decrease my chances of developing complications such as heart disease and blindness.

12. Exercising regularly will reduce my chances of developing chronic health problems.

13. Testing my glucose level is unpleasant.

14. I will feel deprived if I avoid some of my favorite foods.

15. Taking my diabetes medication consistently is necessary for proper control of my diabetes.

16. Completing all of my self-care activities takes a large share of the day that I could devote to other things.

17. Recording my glucose testing results is important for control of my diabetes.

18. I will get sore if I exercise.

19. Following my diet plan will allow me to lose weight.

20. Taking my diabetes medication regularly will cost me a lot of money over the next several months.
APPENDIX W

AUTHOR (HERNANDEZ) PERMISSION LETTERS
From: "Cheri Hernandez" <cherih@delta.uwindsor.ca>
Organization: University of Windsor
To: Diane Orr Chlebowy <dochle0@pop.uky.edu>
Date: Tue, 4 Aug 1998 16:32:23 EST
Subject: Re: Diabetes Activities Questionnaire
Priority: normal
X-mailer: Pegasus Mail for Windows (v2.53/R1)

Diane, so good to hear from you. Yes, you do have my permission to use The Diabetes Activities Questionnaire. I will look forward to meeting you in Minneapolis, later this month.

-CHERI-

Ms. Hernandez, I am interested in using your newly developed Diabetes Activities Questionnaire (1997) as I conduct my doctoral research. Is it possible to obtain your written permission to use this instrument in my study? If so, may I possibly receive a copy? Presently, I have a copy of the instrument which was included in your 1997 publication. Thank you so much for your time.

Also, I will be presenting my research study at the AADE meeting in Minneapolis in a few weeks. I plan to attend your presentation and perhaps can meet you as well.

Diane Orr Chlebowy, M.S., M.A., R.N.
Assistant Professor
UK College of Nursing
(606)257-4204
dochle0@pop.uky.edu

Cheri Ann Hernandez, RN, PhD, CDE
Assistant Professor, School of Nursing
University of Windsor
401 Sunset Avenue
Windsor, Ontario N9B 3P4
Phone: (519) 253-4232 Ext.2263
Fax: (519) 973-7084
e-mail: cherih@uwindsor.ca
Cheri, looking through my files, I have an email message (dated 8/4/98) from you granting your permission to use (but not modify) TDAQ in my study.

May I again have your permission to use and modify TDAQ for use in my study? Thank you. Diane

Do You Yahoo!?  
Sign-up for Video Highlights of 2002 FIFA World Cup
Hi, Diane. Thanks for your email. Yes, you may modify the TDAQ to enhance its validity for use with your study population. I would be most interested in learning re: the changes you make - and how it 'fared' with these changes.

All the best in your research.

-Cheri-

Cheri Ann Hernandez, RN, PhD, CDE
Associate Professor
Faculty of Nursing, University of Windsor
401 Sunset Avenue
Windsor, ON  N9B 3P4
Phone: (519) 253-3000, Ext. 2263
Fax: (519) 973-7084
email: cheri@uwindsor.ca
APPENDIX X

ORIGINAL DIABETES ACTIVITIES QUESTIONNAIRE
The Diabetes Activities Questionnaire

The questions below will ask you about your personal experience with diabetes. Each question is designed to find out about your experience with the activities related to your diabetes. Remember that the word educator can refer to any member of the health care team (doctor, dietitian, nurse, exercise therapist, etc.). For each of the questions below, put a mark (1) through the place on the line that shows your answer. Make sure the mark goes right through the line (see example below).

Example

1. I follow my meal plan exactly as suggested by my dietitian.
   Never [ ] Always [ ]

2. I try to keep my weight within the range suggested by my educator.
   Never [ ] Always [ ]

3. I exercise as often as my educator advised me to.
   Never [ ] Always [ ]

4. I only do exercises/activities recommended by my educator.
   Never [ ] Always [ ]

5. I exercise at the times suggested by my educator.
   Never [ ] Always [ ]

6. Each day I take exactly the number of injections/pills prescribed by my doctor.
   Never [ ] Always [ ]

7. I take insulin/pills at the times prescribed by my educator.
   Never [ ] Always [ ]

8. I only adjust the dose of my insulin/pills if my educator tells me to.
   Never [ ] Always [ ]

9. I test my blood sugar as often as suggested by my educator.
   Never [ ] Always [ ]

10. I test my blood sugar at the times suggested by my educator.
    Never [ ] Always [ ]

11. I treat low blood sugar reactions with the type of food/drink/candy advised by my educator.
    Never [ ] Always [ ]

12. When I have a reaction I only eat/drink the amount suggested by my educator.
    Never [ ] Always [ ]

13. I examine my feet daily.
    Never [ ] Always [ ]

APPENDIX Y

JEWISH HOSPITAL ASSESSMENT QUESTIONNAIRE
**SECTION I BACKGROUND INFORMATION**

1. Your Name: ____________________________
   (Last) ____________________________ (First)

2. Age: ________ Sex: ___ Male ___ Female

3. Race: ________

4. Marital Status: ___ Never Married
   ___ Married
   ___ Separated/Divorced
   ___ Widowed

5. How many people live with you now?
   ___ Adults (more than 18 yrs.)
   ___ Children

6. How much schooling have you completed?
   ___ Less than 8th grade
   ___ Some high school
   ___ High school graduate
   ___ Some college or technical schools
   ___ College graduate
   ___ Some postgraduate education
   ___ Masters, Ph.D., Law degree, etc.

7. What is your occupational status?
   ___ Employed (occupation: _____________)
   ___ Homemaker
   ___ Student
   ___ Retired (former occupation: _____________)
   ___ Disabled

8. My general health is:
   Excellent Good Fair Poor

9. What year were you first told you had diabetes or "borderline diabetes"? 10___ 20___

**DO NOT USE THIS SPACE**

Possible barriers to learning: (circle)
visual
auditory
literacy
other

Primary support person

Shift worked: ____________

Rev. 12-14-00/Forms
10. How would you rate your understanding of diabetes?
   Excellent  Good  Fair  Poor

11. What type of diabetes do you have?
   _____ I do not know
   _____ Type 1
   _____ Type 2

12. Have you previously had diabetes education?
   _____ No  _____ Yes
   Where? ______________________  When? ______________________

13. Do you smoke?  _____ Yes  _____ No

14. What would you like to discuss with the nurse today?

If you DO NOT take diabetes pills or insulin, skip to number 23.

SECTION III  ORAL DIABETES MEDICATIONS
If you take only Insulin, go to number 16.

15. What is the name of the pills you take for your diabetes?
   _____ glipizide (Glucotrol)
   _____ glyburide (Glynase, DiaBeta, Micronase)
   _____ Glucotrol XL
   _____ Glucophage
   _____ Prandin
   _____ Avandia
   _____ Glucovance
   _____ Other ____________

SECTON IV  INSULIN
If you DO NOT take Insulin, skip to number 20.

16. The Insulin(s) I take is/are:
   Name  Dose  Time(s) taken

17. How long have you taken insulin? _____ (years)
18. What areas of your body do you use for your insulin injections? (Circle all that apply)
   Arms Thighs Buttocks Abdomen Other ______

19. Where do you keep the insulin you are currently using?

SECTION V LOW SUGAR REACTION, INSULIN REACTION

20. Do you ever have low sugar (insulin reaction)?
   ___Yes ___No (if no, skip to number 23)

21. How do you feel when having a low blood sugar reaction?

22. What would you do to treat a low blood sugar reaction?

SECTION VI MONITORING

23. A. ___ I do not have a blood sugar meter.
       Skip to question 26

   B. What is the name of your blood sugar meter?

24. How often have you been advised to test your blood sugar?

25. How often do you test your blood sugar?

26. When is the next visit with your primary care MD for diabetes follow-up?

27. What was your last Hemoglobin A1c (three-month average blood sugar test)?
   ___ I do not know the results or know about this test.
SECTION VII FOOT CARE

28. Have you been advised by your MD or other health care professional to take special care of your feet?
   [ ] Yes       [ ] No (if No, skip to questions 31)

29. How often do you check your feet for signs of problems?
   [ ] Not all  [ ] Once a month  [ ] Once a week  [ ] Every day

30. Have you been seen by a Podiatrist (foot doctor) for foot care?
    [ ] Yes       [ ] No

DO NOT USE THIS SPACE

Prior Ulceration Yes No
Intermit Claudication Yes No
Lower extremity bypass Yes No
Amputation: date, side, level
Bony deformities: Charcot foot, hammer/claw toe, hallux valgus, or foot drop, prominent metatarsal heads.
Pedal pulses:
posterior tibial [ ] R [ ]
Dorsalis Pedis [ ] R [ ]
(P=present, A=absent)
Dependent rubor, pallor on elevation
Nails: good condition, thick, too long, fungal infection, ingrown.
Skin condition code: c=callus, d=dryness, f=fissure, m=maceration, p=pres-ulcer, r=redness s=swelling, u=ulcer, w=warmth

Left Foot

Insensate to monofilament
[ ] Yes       [ ] No

Appropriate shoes? Yes No
Explain:

Low Risk: No risk factors
High Risk Number
DPM Consult
**SECTION VIII SOCIAL AND EMOTIONAL FACTORS**

31. Please answer these general questions about your diabetes with one of the three responses.

<table>
<thead>
<tr>
<th>QUESTION</th>
<th>NO</th>
<th>YES</th>
<th>NO OPINION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paying for my diabetes care is a problem?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Having diabetes makes my life very difficult?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am afraid of my diabetes?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I find it hard to believe that I really have diabetes?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have difficulty taking care of my diabetes?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes keeps me from eating the foods that I like?</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

32. The greatest concern related to my health is:

33. What are your current major stresses, if any?

**SECTION IX SEXUALITY/REPRODUCTION**

34. **(MEN)** Are you experiencing erectile dysfunction or loss of libido?

35. **(Women)** Sexuality/Reproduction

   # of pregnancies _____ Birth Weights __________

   Complications _____ Date last period _____
   Pregnancy plans in the future? ________________

   Are you experiencing any problems such as vaginal dryness or loss of libido?
APPENDIX Z

KENTUCKY CLINIC ASSESSMENT QUESTIONNAIRE
UNIVERSITY OF KENTUCKY ENDOCRINOLOGY CLINIC

Name
Age  Marital Status
Date  Occupation

Reason for Today's Visit:

Duration of Problem:

Family History
Has anyone in your family had any of the following:
(Circle AGP if grandparent, AM if mother, AF if father, AS if one or more siblings,
and AC if one or more children)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Gender</th>
<th>Age</th>
<th>Sibling</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obesity</td>
<td>GP</td>
<td>M</td>
<td>F</td>
<td>S</td>
</tr>
<tr>
<td>High blood pressure</td>
<td>GP</td>
<td>M</td>
<td>F</td>
<td>S</td>
</tr>
<tr>
<td>High cholesterol</td>
<td>GP</td>
<td>M</td>
<td>F</td>
<td>S</td>
</tr>
<tr>
<td>Heart disease</td>
<td>GP</td>
<td>M</td>
<td>F</td>
<td>S</td>
</tr>
<tr>
<td>Stroke</td>
<td>GP</td>
<td>M</td>
<td>F</td>
<td>S</td>
</tr>
<tr>
<td>Diabetes</td>
<td>GP</td>
<td>M</td>
<td>F</td>
<td>S</td>
</tr>
<tr>
<td>Cancer</td>
<td>GP</td>
<td>M</td>
<td>F</td>
<td>S</td>
</tr>
<tr>
<td>Kidney disease</td>
<td>GP</td>
<td>M</td>
<td>F</td>
<td>S</td>
</tr>
<tr>
<td>Arthritis</td>
<td>GP</td>
<td>M</td>
<td>F</td>
<td>S</td>
</tr>
<tr>
<td>Thyroid (Goiter)</td>
<td>GP</td>
<td>M</td>
<td>F</td>
<td>S</td>
</tr>
</tbody>
</table>

PAST MEDICAL HISTORY
Have you had any of the following medical illnesses/events? If so, please provide appropriate information.

Illness: Date of onset: Date of hospitalization Comments:

Heart disease
High blood pressure
Diabetes
Thyroid problems
Hepatitis
Stomach ulcers
Intestinal problems
Kidney disease
Kidney stones

Arthritis
Anemia

Thrombophlebitis (blood clots)
Sleep apnea
Psychiatric conditions
Seizures/convulsions
Accidents/injuries
Full term pregnancies
Miscarriages or Abortions
Substance/alcohol addiction
Disability

University of Kentucky Endocrinology Clinic
Transfusions

Surgeries:

<table>
<thead>
<tr>
<th>Reason</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tbody>
</table>

Current Medication (include OTC's)  

<table>
<thead>
<tr>
<th>Dosage</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1.  
2.  
3.  
4.  
5.  
6.  
7.  
8.  
9.  
10.  

ALLERGIES  

Medications  
Foods, etc

PERSONAL HABITS  

<table>
<thead>
<tr>
<th>Question</th>
<th>How much?</th>
<th>For how long?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you smoke or use tobacco products?</td>
<td>How much?</td>
<td>For how long?</td>
</tr>
<tr>
<td>Do you drink alcohol-containing beverages?</td>
<td>How much?</td>
<td>For how long?</td>
</tr>
<tr>
<td>Do you drink caffeine-containing beverages?</td>
<td>How much?</td>
<td>For how long?</td>
</tr>
<tr>
<td>Do you exercise?</td>
<td>What activity?</td>
<td>Frequency</td>
</tr>
</tbody>
</table>
**Review of Systems** (Circle Yes or No)  

**HEENT**  
- Frequent headache: Y N  
- Fainting: Y N  
- Dizziness: Y N  
- Loss of hearing: Y N  
- Change of vision: Y N  
- Dental trouble: Y N  
- Bleeding or swollen gums: Y N  
- Lumps on neck: Y N  
- Glaucoma: Y N

**Cardio-Respiratory**  
- Chest pain/pressure: Y N  
- Rapid or irregular heart beat: Y N  
- Shortness of breath: Y N  
- Chronic cough: Y N  
- Cough with sputum: Y N  
- Swelling of legs and/or feet: Y N

**Gastro-Intestinal**  
- Indigestion or heartburn: Y N  
- Nausea or vomiting: Y N  

**Bowel movements:**  
  - Average Frequency: Per day:  
    - Constipation: Y N  
    - Diarrhea: Y N  
  - Per week:  
    - Abdominal cramps: Y N  
    - or bloating:  
    - Abdominal pain: Y N

**Urinary**  
- Pain: Y N  
- Blood: Y N  
- Night-time frequency: Y N  
- Incontinence: Y N  
  - (Poor bladder control)

**Menstrual**  
- Discharge: Y N  
- Abnormal cycle: Y N  
- Abnormal flow: Y N  
- Excessive discomfort: Y N  
- Unusual complications: Y N  
- Lumps on Breast: Y N  
- Discharge from nipple: Y N  
- Have you had a mammogram? Y N  
- Date of last menstrual period  
- Date of last gynecological exam  
- Current birth control method (if applicable)

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Review of Systems (cont)

**Reproductive (Men only)**
- Impotence
  - Y
  - N

**Musculo-Skeletal**
- Joint pain
  - Y
  - N
- Swelling of the joints
  - Y
  - N
- Back pain
  - Y
  - N
- Leg cramps
  - Y
  - N

**Other**
- Daytime sleepiness
  - Y
  - N
- Difficulty sleeping
  - Y
  - N
- Hotter than usual
  - Y
  - N
- Colder than usual
  - Y
  - N
- Excessive hair
  - Y
  - N
- Loss of hair
  - Y
  - N
- Skin texture, change/problems?
  - Y
  - N

**Psychological**
- Are you presently involved in individual or group counseling or therapy?
  - Y
  - N

**Additional Comments:**

Reviewed by: M.D. Anderson, Frederich, Karounos, Miller, Reynolds, Smith MD

2991RR

University of Kentucky Endocrinology Clinic
APPENDIX AA

KENTUCKY CLINIC HISTORY/PHYSICAL/PROGRESS NOTES
**DIABETES HISTORY**

<table>
<thead>
<tr>
<th>NAME</th>
<th>AGE</th>
<th>AGE AT DIAGNOSIS OF DIABETES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>HOW WAS YOUR DIABETES DISCOVERED?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OTHER FAMILY MEMBERS WITH DIABETES?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HAVE YOU TAKEN ORAL MEDS FOR DIABETES?</td>
</tr>
<tr>
<td>NAME (S) OF ORAL MEDS</td>
<td></td>
<td>WHEN?</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>DO YOU TAKE INSULIN?</th>
<th>WHEN DID YOU START?</th>
</tr>
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</table>

<table>
<thead>
<tr>
<th>CURRENT INSULIN SCHEDULE</th>
<th>AM</th>
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<tbody>
<tr>
<td></td>
<td>NOON</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SUPPER</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BEDTIME</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OTHER TIMES</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>WHO GIVES THE INJECTIONS?</th>
</tr>
</thead>
<tbody>
<tr>
<td>DO YOU ADJUST YOUR INSULIN DOSES?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CIRCLE THE AREAS YOU USE FOR INJECTIONS:</th>
<th>ARMS</th>
<th>LEGS</th>
</tr>
</thead>
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<thead>
<tr>
<th>ABDOMEN</th>
<th>BUTTOCKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DO YOU EVER SKIP YOUR SHOTS?</td>
<td>WHY?</td>
</tr>
<tr>
<td>DO YOU HAVE HYPOGLYCEMIA (LOW BLOOD SUGAR)?</td>
<td>HOW OFTEN?</td>
</tr>
</tbody>
</table>

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<tr>
<th>ANY CERTAIN TIME OF DAY?</th>
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</thead>
<tbody>
<tr>
<td>DO YOU HAVE HYPOGLYCEMIA WITHOUT WARNING?</td>
</tr>
<tr>
<td>WHAT DO YOU DO FOR HYPOGLYCEMIA?</td>
</tr>
</tbody>
</table>
Diabetes History
DO YOU TEST YOUR BLOOD SUGAR?

TYPE OF METER
FREQUENCY OF TESTS
USUAL RANGE OF GLUCOSE AM
BETWEEN SUPER
NOON BEDTIME
DO YOU FOLLOW A DIET?
WHAT TYPE?
WHO INSTRUCTED YOU?
CURRENT WEIGHT WEIGHT ONE YEAR AGO
DO YOU EXERCISE REGULARLY?
DO YOU SMOKE? HOW MUCH? HOW MANY YEARS?
EYE PROBLEMS? LAST EYE EXAM?
KIDNEY PROBLEMS?
LAST URINE TEST FOR PROTEIN?
DO YOU HAVE ELEVATED CHOLESTEROL OR TRIGLYCERIDES?
WHEN WAS YOUR LAST CHOLESTEROL TEST?
DO YOU HAVE PAIN, BURNING, OR NUMBNESS IN YOUR FEET?
HOW IS YOUR OVERALL LEVEL OF CONTROL?
GOOD FAIR POOR
WHAT IS YOUR MAIN PROBLEM NOW?

WHEN DID YOU LAST SEE A DIABETES PROFESSIONAL?

REVIEWED BY ___________________________ MD RN RD

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