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# An analysis of factors related to diabetes self-management in middle-aged and older adult women

Gerry Ann Griffin Molavi

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To the Graduate Council:

I am submitting herewith a dissertation written by Gerry Ann Griffin Molavi entitled "An analysis of factors related to diabetes self-management in middle-aged and older adult women." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Nursing.

Debra C. Wallace, Major Professor

We have read this dissertation and recommend its acceptance:

Bill C. Wallace, Sandra McGuire, Sandra Thomas

Accepted for the Council:

Carolyn R. Hodges

Vice Provost and Dean of the Graduate School

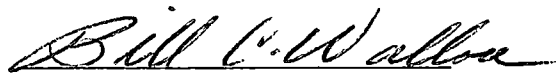(Original signatures are on file with official student records.)

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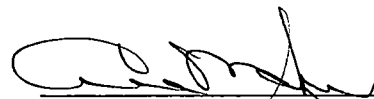
Accepted for the Council:

Interim Vice Provost and
Dean of the Graduate School

# AN ANALYSIS OF FACTORS RELATED

# TO DIABETES SELF-MANAGEMENT

# IN MIDDLE-AGED AND OLDER ADULT WOMEN

A Dissertation

Presented for the

Doctor of Philosophy Degree

University of Tennessee, Knoxville

Gerry Ann Griffin Molavi

August, 2001

# DEDICATION

This dissertation is dedicated to my three sons and my parents. Without their love, understanding, constant encouragement and support I would not have been able to be successful in this quest and challenge. I love you all.

# ACKNOWLEDGEMENTS

# ABSTRACT

The purpose of this study was to explore diabetes self-management in middle-aged and older adult women with Type 2 diabetes and to examine differences between the two groups. Both middle-aged and older adult women have high incidence rates of Type 2 diabetes and are faced with threats to their health and well-being when the disease is not controlled. An important part of diabetes control is through self-management of recommended care, which is primarily the responsibility of the person who lives with the disease on a daily basis. Factors that impact a person's ability to self-manage a complex disease may change at different life stages. This study was an exploration of the relationships of personal factors and the interaction of those factors to diabetes self-management in women with Type 2 diabetes at two different stages of life.

This non-experimental, correlational study was guided by the conceptual framework of the Interaction Model of Client Health Behavior (Cox, 1982). Elements of client singularity (background variables of demographic characteristics, social influences and environmental resources) and elements of perceptive response, (intrinsic motivation, cognitive appraisal and affective response) were examined in relation to participants' health outcome of adherence to a recommended regimen of diabetes self-management. Client-health professional interaction was viewed as diabetes education received by the participant and was examined in relation to diabetes self-management. Inclusion criteria were (a) women ages 50-64 in the

middle-age group; women ages 65 and above in the older age group, (b) black or white race, (c) the ability to comprehend and respond in English, and read on at least a 6th grade level and (d) community-dwelling women who were personally responsible for self-management of their diabetes, and under the care of a health care professional who directed the treatment regimen.

The sample of 134 women (73 middle-age and 63 older age) was collected from both rural and urban communities in southern Appalachia. Women responding to the invitation to participate in the study completed a questionnaire by self-report. The questionnaire included demographic information and also selected scales and questions from the Diabetes Care Profile 2.0 measuring social support, self-perception of health, diabetes understanding, attitude towards diabetes, diabetes education and diabetes self-management. Also included in the questionnaire were the Health Self-Determinism Index for measurement of intrinsic motivation and a visual analog scale of self-reported stress. Data analysis, using SPSS-PC 10.0, included measures of central tendency, Pearson correlation, multiple regression, Durbin-Watson coefficients for analysis of multi-collinearity and Cronbach's Alpha coefficient analysis to assess reliability of the instruments.

Research questions were posed to explore the relationships of personal, social and interaction factors to diabetes self-management in the two groups of women at different life stages and to examine differences in those relationships in the two groups. Findings revealed that women in the middle-age group did differ significantly in their diabetes self-management from women in the older group. Women in the

older group demonstrated a higher level of diabetes self-management than the younger women. Background variables of age, race, education, insurance, social support and income were not shown to be significant predictors of diabetes self-management in either group by multiple regression analyses. However, analysis of the relationships of the individual factors and diabetes self-management revealed social support from family and friends to be significantly related to better diabetes self-management in both groups.

The personal response variables of intrinsic motivation, self-perception of health, diabetes understanding, attitude towards diabetes and stress were found to be significantly predictive of diabetes self-management in both groups by multiple regression analyses. (middle-age: p< .05; older age: p <.001). Individual factor relationship analyses in each group revealed that in the middle-age group, understanding of diabetes management, a positive attitude towards diabetes and lower stress were significantly related to better diabetes self-management. Whereas in the older group, in addition to the same variables mentioned for the middle-age group, having a more intrinsic motivation for health and a more favorable self-perception of health were also significantly related to better diabetes self-management. Women in the middle-age group were noted to demonstrate lower intrinsic motivation, higher stress levels, more unfavorable self-perception of health, but better understanding of diabetes than the older group. Another finding of the study was that diabetes education was not related to diabetes self-management for women in the middle-age

group, who had a higher rate of diabetes education, but was significantly related to diabetes self-management for women in the older group who less diabetes education.

These findings indicate that more information is needed to better understand factors impacting diabetes self-management in women at different life stages. The middle age women in this study were shown to be at high risk due to their lower levels of diabetes self-management, lower intrinsic motivation for health and higher stress than the older women in the study. Diabetes education in itself was not shown to be a significant factor in diabetes self-management for women in the middle-age group. An implication for nursing practice is for assessment of stress and other psychosocial factors in planning diabetes management. Implications for nursing education are for examination of client outcomes, including self-management practices, in relation to educational objectives, and for teaching the impact of personal responses on diabetes self-management in community classes as well as in the formal classroom. The primary implication for nursing research is for a more in-depth exploration of factors related to diabetes self-management in women at different life stages.

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# CHAPTER 1

## THE PROBLEM

Diabetes mellitus is a highly prevalent disease in the United States and exacts a tremendous toll on life. Over 16 million Americans suffer from this disease, with over half that number estimated as being undiagnosed (American Diabetes Association, 2000a; Lebovitz, 1998a). Type 2 diabetes, defined as a relative insulin deficiency or insulin resistance (Lebovitz, 1998b), represents approximately 90-95% of cases of diabetes overall and is usually diagnosed in middle-age, quite often as a result of treatment for another illness (American Diabetes Association, 2000a). The goal of effective diabetes management is maintaining blood sugar to a level as close to normal as possible (Lebovitz, 1998c). The cost of controlling diabetes is high and not only measured in dollars, over $92 billion a year in the United States, but also in lives and quality of life (American Diabetes Association, 1998b; Ebersole & Hess, 1998). Diabetes is a complicated and incurable condition that requires incessant, daily attention and monitoring, which is primarily the responsibility of the person with the disease. The consequences of failing to manage the disease adequately include high rates of complications, such as blindness, kidney disease and amputations and even myocardial infarction and stroke (Lebovitz, 1998c). Factors related to diabetes self-management need to be explored in clients with Type 2 diabetes, but especially in those at highest risk such as women.

# Diabetes in Women

It is estimated that approximately 8.1 million women suffer from diabetes in the United States, comprising over half of the total number of patients in this country, making them the largest group in the nation at risk from this disease (American Diabetes Association, 2000d; National Institutes of Health, 1997). Unfortunately, studies related to specific problems in women with diabetes are not in proportion to the magnitude of the problem. In general, studies related to health of aging women are only recently increasing in the literature. In the 1995 Declaration and Platform for Action of the Fourth United Nations Conference on Women in Beijing, only one paragraph in the strategic objectives for women's health care was related to health needs of the aging woman (Kaveny, 1998). Women develop various types of special needs due to the changes that occur with aging (Matteson, McConnell, & Linton, 1997) which warrant more investigation.

Women with diabetes who have reached the age of menopause and beyond may experience hormone related changes that impact their ability to control blood glucose, which puts them at high risk for complications (Schover & Spector, 1998; Youngkin & Davis, 1994). Menopause is accompanied by a multitude of physiological changes and consequential higher health risks due to the eventual decline in normal estrogen levels (Greendale, Lee & Arriola, 1999; Peterson & Schmidt, 1999). Estrogen deficiency is associated with an increased incidence of cardiovascular events (Lonergan, 1996), but estrogen replacement therapy also impacts glucose levels in diabetic women (Kayne & Holvey, 1998), creating

difficulties in self-management efforts for women who may not be aware of the problem.

Some instances of mental decline in elderly women have recently been linked to high levels of endogenous insulin (Yung, et al., 1998). High insulin levels can be mediated by diet modifications (American Association of Diabetes Educators, 1999), which could reduce the incidence of mental decline from that particular factor. Older persons with diabetes also face a higher morbidity risk due to high rates of co-morbid conditions (Chin, Polonsky, Thomas & Nerney, 2000). If diabetic complications could be avoided, health outcomes for women with Type 2 diabetes could be greatly improved. Many factors play a role in diabetes control, including those that impact a woman's ability to self-manage her disease. More information is needed concerning those factors in relation to diabetes self-management in women.

## Purpose of the Study

The purpose of this study was to explore diabetes self-management in middle-aged and older adult women with Type 2 diabetes and to examine differences between the two groups. The outcome of the study will add to the body of knowledge related to diabetes self-management in middle-aged and older women with Type 2 diabetes and also to the body of knowledge related to the conceptual framework used to guide the study.

# Factors in Diabetes Self-Management for Women

## Stage of Life

Not all aging women face the same situations in their efforts to control their disease, as varying life stages bring on different challenges for women (Youngkin & Davis, 1994). Age brings changes in physiological responses, which include changes in insulin metabolism and utilization in those who are genetically predisposed (American Diabetes Association, 2000a). Besides physiological factors, psychosocial influences have been shown to play a part in diabetes control (Callahan & Williams, 1994; Dietrich, 1996; Morley, 1998). Older women have been reported to be highly motivated to practice healthy habits in the face of chronic illnesses (Haber, 1999; Polly, 1992). However, few studies have been reported that examined motivation for self-care management in women at mid-life with a chronic illness, especially that of diabetes. The majority of studies related to women's health have focused on younger women and a variety of health issues, with fewer studies focusing on health outcomes of aging women (Kaveny, 1998).

One problem identified in finding studies pertaining to aging women is the lack of guidelines for grouping subjects in research according to age. The term "old-age" in most literature refers to those age 65 and above (Haber, 1999) but the term often varies with the author of the study. Chronological age as a variable in research can be confusing. Neugarten, a famed developmental psychologist and sociologist, promoted the recognition of concepts and developmental changes brought about by aging as markers of aging, rather than chronological markers (Haber, 1999).

The problem with grouping women together in diverse age groups is that developmental differences that may be related to specific health outcomes are not considered. Different theoretical approaches have been utilized in the evaluation of client health needs at particular life stages (Antai-Otong, 1995), but not specifically to address women's needs pertaining to diabetes self-management. One method that could be employed is age grouping according to life change responsibilities and developmental events. Middle-age women from age 50 to 64, as well as women ages 65 and above have their own unique responsibilities, issues and problems that may impact their ability to manage a chronic disease such as Type 2 diabetes at different times in their lives. For women, the age of 50 has significance in women's studies as it is generally considered to be the average age for the onset of menopause (Youngkin & Davis, 1994); whereas, age 65 in women has traditionally been associated with retirement of not only women, but their spouses as well, thereby changing the household dynamics for those women at that stage in their lives. Issues in each group differ in many respects, such as physiological changes, as well as psychosocial factors and social interactions, which could impact diabetes self-management.

<u>Socioeconomic Factors</u>

<u>Race</u>

Race could be considered a factor in diabetes self-management as the cultures of black and white women differ in respect to coping mechanisms, support systems and often economic and educational influences (Chin, Polonsky, Thomas & Nerney, 2000; Ruetter, Neufeld, & Harrison, 1998). Religion has been shown to be a strong

factor in diabetes self-management for black women as well (Ruetter, Neufeld & Harrison, 1998).

Economic Resources

Many women face challenges as they age, such as lower income, that puts them at risk for poor health outcomes (Administration on Aging, 1999; Youngkin & Davis, 1994). When women also suffer from an expensive, life-style altering chronic illness such as Type 2 diabetes, and do not have resources for self care, they often rate their health and their attitudes towards diabetes self care negatively (American Diabetes Association, 1998b; Dunn, Beeney, Hoskins & Turtle, 1990). Women face greater financial hardships than men as they age (U.S. Census Bureau, 2001), which could impact their abilities to self-manage diabetes. Studies are lacking that specifically address the impact of poverty on health outcomes for women ages 65 and above (Rueter, Neufeld & Harrison, 1998). The issue of poverty as a factor in diabetes self-management of middle-aged women has not been reported in the literature.

Insurance

Social influences and environmental resources differ for women at different times in their lives. For women with Type 2 diabetes, access to care through adequate insurance is vital to their ability to self-manage their disease. Women ages 50-64 are old enough to develop complications that warrant expensive interventions, and yet too young for a guaranteed source of health care, such as Medicare, to pay for them. Many women in this age category are among the 47 million persons in the United

States who are without health insurance (Administration on Aging, 1999). Those without health insurance are less likely to seek health care unless significant illnesses are present (Smith & Maurer, 2000). Older women ages 65 and above are eligible for Medicare, but medications that may be prescribed, including insulin, to manage their diabetes are not covered by Medicare alone. Private insurances generally cover treatment plans, including diabetes education, medications and provider visits, but not all women with Type 2 diabetes have such coverage and the relationship of insurance and diabetes self-management outcomes has not been reported.

Education

Whether the woman with Type 2 diabetes has at least a high school education or not might be a factor in their ability to self-manage their disease as well. Even though most patient education materials are usually written at the 6th grade level, managing the many facets of a diabetes regimen of care can be complicated and confusing, as reported by some older women with Type 2 diabetes who expressed their feelings about living with diabetes (Chinn, Polonsky, Thomas & Nerney, 2000). An analysis of the relationship of education to diabetes self-management in middle-age and older women has not been reported.

Social Support

Both middle-age and older age women with Type 2 diabetes may have varying levels of social support, depending on family structure, social networks and professional associations. Women with better social support have been shown to cope better with diabetes management (Willoughby, Kee, Deml & Parker, 2000). Lack of

social support, along with stress, has been related to immunosuppression and vulnerability to disease in women (Thomas, 1997a). Whereas some forms of social support have shown to be instrumental in adjustment to diabetes management for some older women (Landis, 1996), it can also have a negative effect for other older women when they decrease their self-care activities (Spitzer, Bar-Tal & Ziv, 1996). Social support from others can be through a variety of sources and in a variety of forms, but the effect of social support on diabetes self-management in middle-age women with diabetes is not known. More information is needed concerning the relationship of social support and diabetes self-management in middle-age and older women with Type 2 diabetes.

<div align="center">Psychosocial Factors</div>

Motivation

Middle-aged women have been shown to be at higher risk for morbidity and mortality than younger women, and sometimes even older women, due to their failure to exercise and to eat healthily (McTiernan, Stanford, Daling & Voigt, 1998). Activities such as exercise and adherence to dietary guidelines that are necessary for glycemic control of Type 2 diabetes are difficult to maintain on a consistent basis and are related to a variety of factors, such as motivation, support and knowledge of disease management techniques (Brown, 1999). Motivational factors for healthy practices, including diabetes self-management, in middle-aged women are still an understudied area in nursing science (Whittemore, 2000). Older women have been shown to have high levels of motivation for good health and often report participation

in some form of exercise, as well as attention to healthy eating patterns (Ebersole & Hess, 1998; Haber, 1999; Ruffing-Rahal, 1998, Tyson, 1999). Motivation for diabetes self-management in older adult women in comparison with middle-age women has not been studied.

Self-Perception of Health

A woman's self-perception of her health is another factor that may impact her diabetes self-management. Women who have a negative view of themselves have a greater problem with self-care in general (Glasgow, Toobert, Hampson, Brown, Lewinson & Donnelly, 1992). The impact of self-perception and health outcomes has been reported differently in research involving older women, with some studies indicating a direct correlation between perception and health (Cox, 1986; McCallum, Shadbolt & Wang, 1994) and other studies refuting that position for older women (Rakowski, Mor & Hirs, 1991). Self-perception of health in middle-age women with Type 2 diabetes as a factor in diabetes self-management and any differences that they may have with older women in that regard have not been fully explored.

Diabetes Knowledge

The ability to manage a complicated self-care regimen that is often the case with Type 2 diabetes involves attention to detail daily. Usually the prescription for self-care involves, at a minimum, dietary guidelines, blood glucose testing, exercise instructions, daily foot care, and in some cases medications which could include insulin injections (American Association of Diabetes Educators, 2000). Women who face such challenges of daily self-care management must be knowledgeable of not

only the techniques, but also the principles involved in each activity in order to adjust their care daily. Dietary, exercise and medication fluctuations could lead to damaging high glucose levels or alternatively low glucose levels requiring immediate action to prevent severe consequences (Farkas-Hirsch & Hirsch, 1998). Therefore, it is necessary that both middle-age and older adult women with Type 2 diabetes have an understanding of what diabetes self-management entails, and be knowledgeable of the self-care regimen prescribed. Fortunately, information about diabetes, and self-management techniques and tips can be found in a variety of places, such as books, pamphlets and Internet sites, in addition to formal classes and individual counseling. Middle-age women in the work force may also be exposed to health promotion programs that provide additional information at work. Diabetes knowledge may therefore differ in women according to the opportunities for knowledge acquisition they encounter. But, information is lacking on the relationship of diabetes knowledge to diabetes self-knowledge in different age groups such as women in middle age versus older women.

<u>Attitude</u>

Patients' attitude towards diabetes is another factor to consider when analyzing self-management outcomes. Wulsin & Jacobson (1998) contend that a client's attitude can serve as a barrier to successful self-care practices. Attitudes in response to a chronic illness such as Type 2 diabetes have been shown to vary among people for many reasons, and in different circumstances (Chin, Polonsky, Thomas & Nerney, 2000; Dunbar-Jacob, Erlen, Schlenk, Ryan, Sereika & Dowell, 2000).

Specific information regarding the relationship of attitudes and diabetes self-management in both middle-aged and older adult women with Type 2 diabetes is needed.

<u>Stress</u>

Stress is another factor that has been investigated in diabetes studies in relation to client health outcomes. Women are said to interpret life events differently at different times in their lives, depending on whether the event evokes a feeling of stress at that particular time in their lives (Antai-Otong, 1995). A difference between women in the middle-aged group (50-64) and those 65 and older that may provide stress is that the younger women may still be in the work force and may have family responsibilities for their young adult children as well as their aging parents (Youngkin & Davis, 1994). Women in the middle-age category who are caregivers to their parents have reported caregiver role strain when they were not in good health themselves, resulting in high stress levels for themselves and their families (Dautzenberg, Diederiks, Philipsen, Stevens, & Tan, 2000). Stress is not limited to women in middle age, but can be detrimental to older women trying to practice self-care behaviors as well (Spitzer, Bar-Tal & Ziv, 1996). Older women age 65 and above may be at home after retirement of both themselves and/or their spouses with other caregiver stresses such as caring for grandchildren. Due to life events and developmental changes, people may differ in their amount of stress and its impact at various times in their lives (Antai-Otong, 1995). More information is needed on the

relationship of stress to diabetes self-management in persons with diabetes (American Diabetes Association, 2000a).

<div align="center">Interactions with Health Professionals</div>

Diabetes Education

Health care professionals in diabetes management consider diabetes education, after prescriptions for treatment and self-care, the primary intervention. Unlike a decade ago when newly diagnosed clients were given a series of educational sessions in the hospital, classes are now most often offered in outpatient settings; however, not all can afford to attend, and even fewer have the benefit of a team approach. Diabetes education programs are now covered by insurance, including Medicare and Medicaid in most states therefore there is a considerable charge for such classes (American Diabetes Association, 2000b), making them unavailable to some clients in need. In the southern Appalachian region of concern the only classes without charge are offered in community settings, usually as spot talks, and not in a comprehensive format, nor individualized for specific client needs. At the same time, it has been stated by diabetes experts that patients who do not receive diabetes education are more prone to major complications from the disease (Brown, 1999).

Jack, Liburd, Vinicor, Brody and McBride-Murry, 1999) suggest that a new research paradigm be explored in diabetes education that focuses on a public health approach in viewing the comprehensive picture of diabetes clients and the challenges they face in diabetes self-management. Knowledge is lacking regarding the relationship of diabetes education and diabetes self-management in middle-age

women and older adult women who might have differing views on their educational

needs. Information regarding the influence of diabetes education on diabetes

outcomes is needed by nurses as well as other members of the health team.

### Approach to Research of Diabetes Self-Management

Many factors are involved in a person's ability or failure to perform or

maintain self- care in the face of chronic illness (Cox, 1982; Heidrich, 1998).

Unfortunately, the individuality and uniqueness of the diabetes patients' situations are

often not explored or appreciated in the assessment of their poor health outcomes, but

rather clients are often labeled as "non-compliant" in their health self-management

(Trief, Grant, Elbert & Weinstock, 1998). Each person has their own unique way of

responding to self-care challenges and health threats when faced with a chronic

illness such as Type 2 diabetes, which should be considered prior to the development

of interventions to effect change in outcomes.

Cox (1982) contends that clients have specific elements of self that are

internal and externally influenced by others, such as health care professionals, and

that impact their health outcomes. By understanding the relationships of the elements

of the client to their adherence to prescribed plans for their diabetes management, a

more realistic picture of their unique needs can be obtained. Additionally, nursing

interventions and interactions can be tailored to the uniqueness of women in each age

category with special needs for diabetes management, which can serve to help

empower the women to perform self-management of their disease. Therefore,

research that explores factors impacting diabetes self-management in women of both

middle age and older age is needed, especially from a holistic approach and a community nursing perspective.

## Conceptual Framework

The conceptual framework of this study was the Interaction Model of Client Health Behavior (IMCHB). Cheryl Cox (1982) designed the proscriptive model to provide a framework for identifying relationships among the variables in the elements of client singularity, client-provider interactions and client health outcomes, relevant to improvement of nursing practice. Cox states that the IMCHB is designed with "emphasis on the process by which the singular position of each client on those variables is translated into health care behavior" (1982, p. 46). The IMCHB is an appropriate model for community health nurses to use in working with diabetes clients. This model provides a holistic perspective of client health behavior and outcomes and a theoretical direction in planning client-professional interactions. The IMCHB is based on assumptions regarding client behavior, which guide the implementation of the model in nursing research and practice.

### Assumptions of the Conceptual Framework

The first assumption of the IMCHB is that clients are unique and, if allowed, can competently make their own decisions regarding health choices and behaviors by way of "cognitive appraisal", which is influenced by the person's intrinsic motivation and affective response. Mature adults with chronic illnesses, such as diabetes, have been shown to be motivated to adhere to recommended care, but influencing factors often interact to influence outcomes (Anderson, 1985; Berman & Iris, 1998; Funnell,

Arnold, Fogler, Merritt & Anderson, 1997; Glasgow, Hampson, Strycker & Ruggerio,
1997). Measurements of "adherence" to healthy habits and recommended practices,
such as managing medications, blood glucose monitoring, diet management, exercise,
foot care and return visits to health care providers, are considered the necessary
methods to analyze health outcomes in diabetes management (American Diabetes
Association, 2000). It is the understanding by health professionals of the differences
in adherence and clients' outcomes, and the reasons for such, that can influence better
outcomes for clients (Glasgow, 1999).

The second assumption is that clients should be allowed control over their
health decisions, as they are internally and externally capable (Cox, 1982). Patients,
by virtue of the fact that they must be aware of their diabetes continually, are
responsible for much of their own care and management (American Diabetes
Association, 2000c). In order to assist a person to take control, a thorough assessment
of their abilities, attitudes, perceptions and motivational strengths, is essential
(Glasgow, 1999).

The third assumption of the IMCHB is that client and health care professional
perceptions are not always compatible. Numerous studies have shown that attitudes of
health care professionals and patients differ in regards to diabetes principles of
management (Anderson, Funnell, Butler, Arnold, Fitzgerald & Feste, 1995; Funnell,
Arnold, Fogler, Merritt & Anderson, 1997; Glasgow, Hampson, Strycker & Ruggiero,
1997; Lutfey & Wishner, 1999; Molavi [unpublished], 1995; Rayman & Ellison,
1998; Ruggerio et al, 1997). Nurses' attitudes towards the importance of diabetes

management can strongly influence the attitudes of clients. If clients' attitudes towards diabetes management are deemed to be detrimental to their ability to manage self-care, the nurse should endeavor to understand the factors related to such attitudes. The IMCHB is a model that allows for a comprehensive consideration of the many factors that may play a role in clients' diabetes self-management through consideration of the elements of the model.

<div align="center">Elements of the IMCHB</div>

The IMCHB is organized into three elements in a complex, inter-relational model: (1) element of client singularity, (2) element of client-professional interaction and (3) element of health outcomes. The model demonstrates a nonrecursive relationship among the elements with a "multidirectional causal flow with feedback mechanisms that suggest the mutual influence of one set of elements on another" (Cox, 1982, p.47). See Figure 1.

The Element of Client Singularity

This element includes background variables and the variables of cognitive appraisal, intrinsic motivation and affective response. This author terms the latter three "personal response variables". The client's uniqueness is a primary consideration of the element of client singularity. Cox (1982) contends that, "The model suggests that individuals can be assessed as to the way in which these multiple variables are expressed and interact with one another" (p. 48). In working with clients with Type 2 diabetes, understanding the various elements of client singularity is vital

**Elements of Client Singularity**
**Background variables:**

1. Demographic characteristics
   *(Age, Race)*

2. Social influences
   *(Social Support Scale)*
   *(Education)*

3. Previous health care
   Experiences

4. Environmental resources
   *(Income, Insurance)*

**Elements of Client-**
**Professional Interaction**

Affective support

Health information
*(Diabetes education)*

Decisional control

Professional/technical
competency

**Personal Response variables:**

Intrinsic motivation
*(HSDI)*

Cognitive appraisal
*(Self-perception,*
*Diabetes Understanding)*

Affective response
*(Positive Attitude Scale)*
*(Stress scale)*

Non-recursive block

**Elements of Health**
**Outcomes**

1. Utilization of
   Health care services

2. Clinical health status
   indicators

3. Severity of health care
   problem

4. Adherence to the
   recommended care regimen
   *(Self Care Adherence*
   *Scale)*

5. Satisfaction with care

**Conceptual Framework: The Interaction Model of Client Health Behavior with Study Variables**

*Study variables are in italics*
Cox. C.L. (1982). An interaction model of client health behavior: theoretical prescription for nursing. Advances in Nursing Science, 10, 41-56.

Figure 1.        Cheryl Cox's Interaction Model of Client Health Behavior

to understanding factors of health outcomes. The process of understanding begins with consideration of the client's unique background variables.

### Background Variables

Background variables are those attributes related to aspects of the person (client) that are influential on their health outcome and include demographic characteristics, social influences, previous health care experiences and environmental resources.

### Personal Response Variables

Another component of client singularity consists of the client's intrinsic motivation, cognitive appraisal and affective response, which all involve personal responses of the individual to their health concerns, and which are potentially, and uniquely, influenced through interactions with the individual's background variables, as well as interactions with others.

Intrinsic motivation. Intrinsic motivation, "recognizes choice, desire, and the need for competency and self-determinism as causal factors in behavior" ( Cox, 1982, p. 49) and is viewed as a "primary element within the model" (Cox, 1982, p.49). Cox contends that the element of intrinsic motivation, as viewed through the IMCBH, is different from other constructs of motivation in that the role of affect and the influence of interaction are primary considerations in the model. Intrinsic motivation deals with a person's choice, desire, and need for competency and self-determinism as causal factors in health behaviors.

Cognitive appraisal. Cognitive appraisal is the element of the client that represents the interpretation of their health, or their own perceptions, or even their level of knowledge of a health condition. Cox states that the IMCHB supports the view that clients act in accordance with their own perceptions of reality, as represented by their cognitive appraisal, which may be measured in various ways. "These perceptions may or may not be congruent with objective reality" (Cox, 1982, p. 50), but they are what the person perceives to be true at the time. A person's understanding related to their health, or self-care instructions, can also be their cognitive appraisal of that aspect of their health (Cox, 1982). In Cox's 1986 study of community-dwelling elders cognitive appraisal was examined through a score representing elders' perceptions of their health status and how their health status compared to their peers (Cox, 1986). Assessing self-perception of health, as well as knowledge of diabetes in middle-age and older women with Type 2 diabetes is one way of examining their level of cognitive appraisal in relation to their diabetes self-management practices.

Affective response. Affective response, or emotional arousal, as termed by Cox (1982), refers to how the person reacts to health related problems, conditions and/or needs. Cox states that, "emotion can disrupt or interfere with cognitive activity and thus substantially affect behavior" (p. 50). Affective response could include a person's attitude towards their illness as well as stress felt in the face of their illness. Stress emotions can distract from intellectual reasoning in a health matter. Cox

(1986) contends that the concept of affective response refers to how a person reacts to a given health concern and their "feelings" related to that reaction.

Findings from recent behavioral studies related to diabetes self-management have focused on the need for a broader view of clients' individual needs and personal perceptions in relation to their self-management of such a highly complex and tedious disease (Anderson & Funnell, 1999). In this study, affective response of women with Type 2 diabetes was examined by assessing positive attitude towards the disease as well as self-report of their level of stress.

Element of Client-Professional Interaction

The second set of elements of the IMCHB is termed client-professional interaction. The IMCHB "identifies the client- professional interaction as a major influence on health care behavior" (Cox, 1982, p. 51). Cox explains that the interaction between client and health care provider will vary based on their individual elements of singularity and the expressed health need. The interaction is potentially continuous and reciprocal. The four elements in this part of the model are (1) affective support, (2) health information, (3) decisional control, and (4) professional/technical competency. In this study, health information, viewed as diabetes education, will be examined in relation to the participants' self-management of Type 2 diabetes.

Health information

Cox (1982) states that the provision of health education should be more than just teaching the health behavior that is recommended for managing a particular

health problem. She contends that imparted knowledge can be used by the health professional to reduce negative responses and to incorporate positive feedback to boost the clients' self- determinism and sense of competency. Incumbent on the health professional is also the obligation to tailor health education to meet the specific needs of the individual. Diabetes education is described as one of the most frequently prescribed programs of health education (Sadur, et al., 1999). Persons with Type 1 diabetes are usually provided with some degree of education about the disease and self-management strategies due to the immediate consequences resulting from lack of insulin (Brown, 1992). However, in Type 2 diabetes, unless the patient suffers from symptomatic low blood glucose, relatively high glucose levels can do their damage to the body for years and not be noticed until complications are overtly manifested (American Diabetes Association, 1999). Those persons with Type 2 diabetes who are not prescribed insulin are less likely to be offered diabetes education (Sadur, et al., 1999). The problem is many faceted in Type 2 diabetes education. The most common oversight is in asking the client if they understand what they are supposed to do to self manage their disease (Clement, 1995). Offering diabetes education is still an uncommon occurrence in primary health care today. Whether those who have received diabetes education, regardless of the type, differ from those who have not, in their ability to manage self-care of their disease is not known.

The Element of Health Outcomes

The element of health outcomes in the IMCHB consists of 5 outcomes, including adherence to recommended care. Numerous studies have been conducted

using the IMCHB in examining the interaction between and among the various components of the elements of client singularity and the elements of health outcomes (Cox, 1986; Cox, Cowell, Marion & Miller, 1990; Cox, Miller & Mull, 1987; Cox & Roghmann, 1984; Cox, Sullivan & Roghmann, 1984; Farrand & Cox, 1993; Walker, 1988). However, the author of the model contends that "these variables (health outcomes) will be useful in various degrees for different purposes, and only infrequently will more than one variable be of interest within a single investigation" (Cox, 1982, p. 53). For the purpose of this study, the health outcome of "adherence to the recommended care regimen" was examined in relation to the elements of client singularity and client-professional interaction as factors in diabetes self-management of community-dwelling middle aged and older adult women with Type 2 diabetes.

Adherence to recommended care regimen

Adherence to a recommended care regimen is viewed as an independent decision of the client with diabetes, based on their personal goals for health (Lutfey & Wishner, 1999). Cox (1982) contends that clients' choices for their own health can be viewed as health outcomes, such as adherence to recommended care regimen, that are complexly related to other factors of their singularity and interactions with others. The examination of adherence to a recommended self-management regimen of care for Type 2 diabetes in middle-aged and older adult women in relation to internal and external factors, and through the theoretical framework of the IMCHB, has not been reported in the literature. The IMCHB is reported by Cox (1982) as having "greatest usefulness in those situations in which the client's personal responsibility and control

of the health problem or health promotion effort is paramount" (p. 47). The need for diabetes self-management by clients at high risk for morbidity and mortality from Type 2 diabetes, such as middle-aged and older adult women is a situation where the personal responsibility of clients is assumed by health care professionals, but not always demonstrated by the clients. Greater understanding is needed regarding the factors that impact this population's adherence to their prescribed regimen of diabetes self-management.

## Research Questions

The purpose of this study was to explore diabetes self-management in middle-aged and older adult women with Type 2 diabetes and to examine differences between the two groups. The research questions were:

1. Are there differences in diabetes self-management between middle-aged and older adult women with Type 2 diabetes?

2. What are the relationships among background variables and diabetes self-management in middle aged and older adult women with Type 2 diabetes?

3. What are the relationships among personal response variables and diabetes self- management in middle-aged and older adult women with Type 2 diabetes?

4. Are there differences in diabetes self-management for middle aged and older adult women who have been given health information as opposed to those who have not?

## Definitions

### Background Variables

These are the individualistic elements of client singularity that include both immutable and mutable variables that could influence a client's health outcomes (Cox, 1982). Included in this set of elements are demographic characteristics, social influences, and environmental resources.

### Demographic Characteristics

These variables are considered immutable characteristics of individuals that are predetermined, and potentially affect an individual's health outcomes. In this study women, age and race (black or white) were examined.

### Social Influences

Social influences are considered those social factors that are present in a person's life that may impact their health outcomes. Social influences in this study were measured as social support and educational level. Educational level was measured by self-report of their number of years of education. Social support for diabetes self-management of the participant by family or friends was measured by the Social Support Scale of the Diabetes Care Profile (Michigan Diabetes Research & Training Center, 2000).

### Environmental Resources

These background variables encompass a variety of environmental factors that potentially impact health outcomes of individuals. Environmental influences examined in this study were household income and existence and type of health

insurance for the previous 12 months. Private insurance was used as the environmental influence in the analysis. Both variables were items on the demographic data sheet.

<div align="center">Personal Response Variables</div>

These are the elements of client singularity that are mutable, internally manifested, and potentially influenced through interactions with others, such as health care professionals (Cox, 1982). These variables include the elements of intrinsic motivation, cognitive appraisal and affective response.

Intrinsic Motivation

This is defined as the element of client singularity that "recognizes choice, desire, and the need for competency and self-determination as causal factors in behavior" (Cox, 1982, p. 49). In this study intrinsic motivation was examined as the participants' self-efficacy in diabetes self-management and determinism in health matters and was measured using the Health Self Determinism Index (Cox, 1986).

Cognitive Appraisal

This element of client singularity is defined as the client's self-perception, especially in regard to their health state (Cox, 1982). Self-perception, or cognitive appraisal, can include a client's understanding, or knowledge, of a health matter as well (Cox, 1982). In this study cognitive appraisal was examined as the participants' self-rating of their health (one question) and through a self-rating of their understanding of diabetes management as measured by the Diabetes Understanding

Scale of the Diabetes Care Profile (Michigan Diabetes Research & Training Center, 2000).

Affective response

This element of client singularity is defined as the clients' "emotional arousal" in response to a health threat (Cox, 1982, p. 52). Emotions can serve as a basis for forming attitudes, which may be positive or negative. In this study positive attitudes towards diabetes were examined as affective responses to the disease, and therefore potentially influencing factors on self-care management. Affective response was measured by the Positive Attitudes Scale of the Diabetes Care Profile (Michigan Diabetes Research & Training Center, 2000). Stress is also considered to be an affective response (Cox, 1986) in the face of a health threat. In this study women were asked to rate their current stress level on a visual analog scale of 1-10, with 10 representing the most stress.

<div align="center">Client-Health Professional Interaction</div>

Health information

This is one of the elements of client/professional interaction in the IMCHB that is considered a primary intervention of nurses and other health care professionals (Cox, 1986). In this study participants will be asked if they have been provided with diabetes education by a health care professional. This question is a component of section III in the Diabetes Care Profile (Michigan Diabetes Research and Training Center, 2000).

Client Health Outcome

Adherence to Recommended Care Regimen

Adherence to the recommended care regimen is defined through the conceptual framework of the IMCHB as a positive health outcome that reduces risk to health in the client, and may be conceptualized in different ways according to the client situation (Cox, 1982). In this study it was viewed as the dependent variable of diabetes self-management. Adherence to the recommended care regimen was measured by the Self Care Adherence Scale of the Diabetes Care Profile (Michigan Diabetes Research & Training Center, 2000).

**Significance**

The cost of diabetes is high in terms of morbidity, mortality and monetary considerations and is constantly on the rise (Lutfey & Wishner, 1999). The cost of diabetes care, in monetary terms, is estimated to exceed 96 billion dollars annually (Agency for Healthcare Research and Quality, 2000; American Diabetes Association, 2000a). The cost in human suffering from lost limbs, lost eyesight, lost function of vital body organs and decreased quality of life is immeasurable. In 1996, death certificates in the United States listed diabetes in 193,140 deaths. Diabetes is now considered to be at least the seventh leading cause of death in America but is believed to be underreported both as a condition and cause of death (National Diabetes Information Clearinghouse, 1999). With recent evidence that indicates diabetes is an indirect cause of cardiovascular disease in Type 2 patients, the mortality ranking of

the disease could move to the top of list (American Diabetes Association, 2000; Engfeldt, 1998). Type 2 diabetes has been proven to be a large contributor to morbidity and mortality for all age groups, however disproportional mortality rates have been shown to decrease with older adults, while remaining high for middle aged adults (Damsgaard, Friland & Mogensen, 1997). Middle-aged women are therefore at a higher mortality risk than older women with Type 2 diabetes.

Middle-aged adults have a high incidence of Type 2 diabetes, with women ages 50-64 being afflicted more often than men in that age category (National Diabetes Information Clearinghouse, 1999). It is estimated that 8.2% of American women have diabetes (approximately 8.1 million), with almost one third of them not being aware of the disease, even though women with diabetes are 7 ½ times more likely to suffer activity-limiting problems, such as peripheral vascular disease, than non-diabetic women (American Diabetes Association, 2000d). Another 20-25% of older and middle-aged adults, the majority being women, also suffer from impaired glucose tolerance, which is associated with a two-fold increase in the incidence of macro-vascular complications that result in often fatal incidents of myocardial infarctions and/or cerebral vascular accidents from atherosclerosis (American Association of Diabetes Educators, 1999). Quite often middle-aged adults are diagnosed with Type 2 diabetes after seeking health care for another health problem, such as leg pain or cardiovascular related complaints.

As each new study reveals links of diabetes with aging problems and major organ failure, and other studies indicate the strong links between glucose control and

lower morbidity and mortality rates, the emphasis on glucose control through diabetes management becomes more important for both diabetes patients and health care providers (American Diabetes Association, 1998a). The Agency for Healthcare Research and Quality (AHRQ) reported that Type 2 diabetes patients who have good glucose control and who are followed closely by health care providers with proper treatment and referrals, are able to reduce the incidence of blindness by one half and kidney disease by two-thirds (AHRQ, 2000).

Type 2 diabetes patients spend over 3 million days in hospitals and make over 15 million office visits each year in the United States, with constantly rising rates of complications. Type 2 diabetes is associated with some factors that are not mutable, such as older age, race/ ethnicity, family history of the disease, and prior history of gestational diabetes in women (American Diabetes Association, 2000d). However, this type of diabetes, which primarily is seen first in middle-aged adults, is also associated with lack of physical exercise, poor dietary habits, and excess weight, which are mutable factors (National Diabetes Information Clearinghouse, 1999; Smith & Maurer, 2000).

Addressing the lifestyle habits that are changeable in community-dwelling clients with Type 2 diabetes is a focus area in the *Healthy People 2010* goals for the nation (U.S. Department of Health and Human Services, 2000). Health promotion and intervention objectives related to diabetes in the United States increased from the previous 5 to 17 in the current *Healthy People 2010* document (Vinicor, Burton, Foster & Eastman, 2000), primarily due to high morbidity and mortality rates

associated with this disease. However, diabetes remains a disease that is self-managed on a daily basis by those who have the disease.

In order to address the issues concerning health outcomes related to self-management of Type 2 diabetes, more information is needed from the persons who personally face the disease daily. A variety of factors remain to be explored in diabetes self-management, such as personal motivations, perceptions, and attitudes of the clients, as well as their personal background variables. Older adult women are generally a highly motivated group, but they have more hospitalizations and require more health care interventions than any other age groups (Haber, 1999). Social influences of older women have also been explored in relation to their health outcomes (Barnett, Harnett & Bond, 1992; Fremont & Bird, 1999; Robert, 1999), however, they have not been reported in a comprehensive, holistic study that incorporates a nursing theory focused on interactions of the clients, their environment, and other persons. In addition, sparse information exists related to middle aged women with Type 2 diabetes and factors related to their diabetes self-management. The studies that have addressed health issues specifically in the 50-64 age group of women have reported lower rates of exercise and higher rates of obesity, and yet did not address motivation, nor other mitigating factors in relation to health in women with Type 2 diabetes (McTiernan, Stanford, Daling & Voigt, 1998).

## Contribution to Nursing Science

The overall goal for health professionals working with diabetes clients is a better health outcome for individuals, their families and the community. The *Standards of Practice for Public Health Nursing* (Stanhope & Lancaster, 2000) provide directives for nursing interventions that are theory guided and based on comprehensive, and holistic assessments of clients, as well as populations at risk in communities. Providing health information for diabetes clients is perhaps the most accepted nursing intervention for promoting self-care management (Whittemore, 2000). Nurses in various community health settings share the responsibility for health promotion through the planning and implementation of primary, secondary and tertiary prevention strategies related to diabetes (Smith & Maurer, 2000).

Type 2 diabetes has been a priority in health promotion efforts for the past 20 years through the *Healthy People 2000/2010* goals and objectives that have been nationally recognized and implemented (U.S. Department of Health & Human Services, 2000). However, in spite of nation-wide efforts to address the rising incidence of Type 2 diabetes, morbidity and mortality rates continue to climb (American Diabetes Association, 2000a). Therefore, nurses working with diabetes clients in community settings should consider alternative strategies in promoting positive health outcomes for their clients by tailoring interventions to meet the specific needs of the populations at risk. In order to do so, nurses must first be aware of the factors that impact their diabetes clients' abilities to perform self-management (Rayman & Ellison, 1998). Those factors may be as complex as human behavior

responses to health threats or as simple as a client not receiving the education to appropriately perform self-management. Community-dwelling diabetes populations are heterogeneous, and span the ages from children to the elderly. Therefore, analysis of a specific segment of the population at risk is justified, especially for middle-aged and older adult women with Type 2 diabetes who have been shown to be at high risk for morbidity and mortality when their diabetes is not controlled.

The body of nursing knowledge related to middle-aged and older adult women with Type 2 diabetes is limited, especially concerning factors impacting self-management of diabetes for this population. Jack, Liburd, Vinicor, Brody and McBride-Murry (1999) state that, "To improve health outcomes for people with this disease (diabetes), it is critical that we understand why some people adopt and maintain self-management techniques and others do not" (p. 775). More information is needed to better understand the relationship of the unique elements of client singularity and client-health professional interaction to diabetes self-management of both middle-age and older adult women who dwell in our community. This study was an attempt to provide additional information about those relationships as a first step in a comprehensive approach to obtain a better understanding of the many factors impacting diabetes self-management in both middle-age and older adult women with Type 2 diabetes in the southern Appalachian region of concern. Results of the study will be used to inform nurses involved in practice, education and research related to female clients suffering from Type 2 diabetes.

## Summary

Various factors have been shown to impact the ability of persons with Type 2 diabetes to attain and maintain adequate control of their disease. Not only do factors related to demographic characteristics, social influences, environmental resources, and personal responses to health play a part in diabetes outcomes, but the interaction by a health professional in providing diabetes education may impact a person's ability to manage self-care adequately as well ( Cox, 1982; Matteson, McConnell & Linton, 1997).

Aging women are especially affected by Type 2 diabetes, as they are more likely to suffer from cardiovascular events as a result of the disease. Type 2 diabetes impacts health in women of both middle and older age with devastating consequences. However, recent studies have shown that Type 2 diabetes can be controlled, resulting in positive outcomes for those who suffer from the disease, but adherence to a daily regimen of care is required to achieve and maintain control. Older adult women have been reported to practice better health habits than their younger counterparts, and therefore adhere to recommended regimens of care more readily. Studies related to adherence to self-care regimens in community dwelling older women are limited, and have not specifically focused on self-care management abilities of this group, especially in comparison with another group of women in a different stage of life, such as those in mid-life. Both middle-aged and older women face challenges related to developmental changes and family pressures. Such factors

rarely have been comparatively examined in relation to diabetes self-management in this these age groups.

# CHAPTER 2

## REVIEW OF THE LITERATURE

The purpose of this study was to explore diabetes self-management in middle-aged and older adult women with Type 2 diabetes and to examine differences between the two groups. In this study, adherence to a recommended regimen of self-management of diabetes was viewed as the desired health outcome. The elements of client singularity, client/nurse interaction and health outcomes, as conceptualized through the Interaction Model of Client Health Behavior (Cox, 1982), guided the literature reviewed in examining previous knowledge of factors related to diabetes self-management in middle-aged and older adult women with Type 2 diabetes. Under the element of client singularity, studies that examined demographic characteristics, as well as other studies that focused on social influences and environmental resources in relation to health outcomes for women with Type 2 diabetes were reviewed. In addition, studies that focused on middle-aged and older women's perceptive responses in relation to the health threat of Type 2 diabetes; such as motivation, self-perception, attitudes and stress of were reviewed. Few studies were found that specifically addressed health outcomes of middle-aged women with Type 2 diabetes, although women in that age group were included many of the studies of "older" women.

Interactions by health professionals, including diabetes education, were examined in the literature in relation to the effect such interactions were reported to have on health outcomes of clients with diabetes. When found, outcomes specifically

related to older and middle aged women with diabetes were reported. Literature involving use of the IMCHB was reviewed.

**Elements of Client Singularity: Background Variables**

<u>Demographic Characteristics</u>

Physiological changes as a result of age and gender that impact diabetes control have been reported in the literature. Results from studies of pathophysiolgical changes that take place with diabetes provide some insight into the complexity of managing the disease, and support for further examination of factors related to self-management.

The association between insulin and cognitive function in an elderly population was explored in an experimental study of 5,510 participants ages 55 and above by Stolk and colleagues (1997). Serum insulin was measured 2 hours after giving the subjects an oral glucose load, while concurrently administering the Mini Mental State Examination. Only women were found to demonstrate a decrease in cognitive function with a corresponding increase in post-load insulin. The association was shown to be present in women with and without cardiovascular disease and present after excluding subjects with diabetes. Insulin production is triggered by carbohydrate intake, in all persons, but in persons with Type 2 diabetes, insulin is produced at higher levels for a number of years, creating cellular resistance to insulin, as well as increased fat deposits, especially in the abdominal area. This phenomenon is exclusive to Type 2 diabetes and is more pronounced in women, especially as they age.

Pascott and colleagues (2001) studied 203 middle-aged women with and without normal glucose tolerance to determine the effect of abnormal glucose tolerance and visceral fat on metabolic functioning in women of that age at high risk for Type 2 diabetes. The findings were that high visceral fat accumulation was a major factor in abnormal metabolic functioning in the women with abnormal glucose tolerance. Women especially are prone to the accumulation of high visceral fat as Type 2 diabetes develops and progresses, but can be attenuated through regular exercise. Exercise is most often the first prescription for diabetes self-management given by health professionals but the physiological rationale behind the benefits is most often not explained.

Hiltunen, Laara & Keinanen-Kiukaanniemi (1999) found in a 3 year, longitudinal study in Finland that glucose tolerance declined at a relatively high level in the elderly population as a result of the aging process. Increased mortality in women as a result of the changes was reported Such changes that occur due to pathophysiological processes intensified by the combination of normal aging and cell destruction from diabetes, only serve to further compromise an elderly person's ability to self manage their disease.

Gender

Besides studies that examined the physiological effects of diabetes in aged populations, a few studies have also involved women with Type 2 diabetes facing normal physiological changes that occur with menopause. Toth, Sites, Eltabbakh and Poehlman (2000) examined the effect of menopausal transition on insulin sensitivity in

43 pre-menopausal and 40 early menopausal women by measuring serum insulin and glucose levels by glucose challenge. They also examined abdominal fat and body composition in the participants. No differences were found in fat free mass between the groups. However, total body fat, subcutaneous abdominal fat, and intra-abdominal fat were found to be significantly higher in the post-menopausal group, compared with the pre-menopausal group. Findings from this study conflicted with those from a previous, study examining the same population. Walton, Godsland, Proudler, Wynn & Stevenson (1993) reported that insulin sensitivity was 50% greater for postmenopausal women, compared with pre-menopausal women using similar research techniques. It is important to consider the effect of menopause on insulin sensitivity in predicting the occurrence of and treatment of Type 2 diabetes in women of this age group. Insulin sensitivity, or the lack of, dictates which type of medication therapy to prescribe, and helps to explain the variabilities in blood glucose readings that a woman may experience during menopause. However, other issues related to menopause also impact diabetes in women.

Heart disease is the leading cause of death in women over age 50 in the United States (NWHIC, 1998). A major factor related to heart disease in women is reported to be the change in hormone levels as a result of menopause (ADA, 1997). Hormone replacement therapy has been reported to reduce the risk of cardiovascular events for menopausal women (Maseri, 1997), but conflicting information has been reported for menopausal women with diabetes.

In 1996 Robinson and colleagues found that diabetic women had a blunted response to the high-density lipoprotein (HDL) raising effects of estrogen, and an increased triglyceride response. The findings indicated that diabetic women on estrogen replacement therapy are at an increased risk of pancreatitis from the potentially high tryglyceride levels, and at an increased cardiovascular risk from the blunted response of the "good" cholesterol, HDL. No mention was made of the different hormone replacement regimens, including those that add progesterone to the estrogen, which have been reported to increase blood glucose levels in women with diabetes (Schover & Spector, 1998). A more recent study by Ferrara, Karter, Ackerson, Liu and Selby (2001) that examined the effect of hormone replacement therapy (HRT) on HgbA1c levels found that HRT was independently and significantly associated with a decrease in HgbA1c in the cohort of over 15,000 women ages 50-98 years old. The researchers in that study concluded that HRT, including a regimen of treatment with progesterone, was not shown to worsen glucose levels in women with diabetes. However, they reported that larger clinical trials are needed to better understand the extent of the effect of HRT on glycemic control in women with diabetes.

In spite of physiological changes that occur with the aging process, especially in women, that have been shown to play a role in diabetes control, such information is not included in diabetes education programs for community dwelling clients (American Diabetes Association, 2000b). When diabetes outcomes are assessed through the medical model, which focuses on biophysical influences, poor

physiological outcomes are most often related to behavioral problems with clients. However, as research indicates, physiological influences related to aging and gender are involved in diabetes control, and therefore impact a client's ability to self manage their disease.

Koch, Kralik and Sonnack (1999) focused on the intrusion of Type 2 diabetes in women's lives in their participatory action-oriented research approach that allowed the six women who participated to speak about their illness experiences. The researchers found that even though a wellness theme was revealed that focused on taking time out, negative experiences were dominant for the women. The conclusion of the researchers was that health care professionals need to allow women with diabetes to have a voice in their health care and to appreciate the uniqueness of their experiences. Studies were not found that focused on women in different stages of life development.

Age

Age was reported as one of the predictive factors of diabetes self-management in a study by Ruggiero and colleagues (1997. The study authors found that effective diabetes self-management occurred more frequently as age increased, even in the absence of diabetes education. In another study, Rosenthal, Fajardo, Gilmore, Morley & Naliboff (1998) found poor diabetes self-management to be a factor in hospitalization rates of elderly patients. In their longitudinal study of 135 elderly patients with and without Type 2 diabetes, after three years the diabetic group demonstrated no significant differences in mortality rates from the non-diabetic group,

but had more than twice the number of hospitalizations from diabetes out of control. All persons hospitalized were community-dwelling elders who were expected to self-manage their disease. No comparisons were made between those who had been instructed in self-care and those who had not.

Age and the female gender have been indicated as influential factors in relation to diabetes control. Differences between the age groups of middle age and older adult women have not been explored in relation to their disease self-management. Women 65 years of age and above no longer face the stresses and hormonal changes associated with menopause, as do middle aged women. Life styles change as people age, and stresses on women at one stage of life are not the same as those in later life (Youngkin & Davis, 1994). Research to date has not addressed the differences in self-management of Type 2 diabetes in relation to different age categories of women.

Race

Race is a factor that has recently been studied more extensively in relation to Type 2 diabetes, especially in women. Type 2 diabetes is the fourth leading cause of death in African American women, and affects 23.4% of women over age 55 in this race (Rajaram & Vinson, 1998). Cultural differences, including genetic and psycho/social factors, place the African American woman at high risk for poor health outcomes (Rajaram & Vinson, 1998).

The role that race plays in diabetes clients' abilities to self-manage Type 2 diabetes has been explored from several different perspectives. For example, Amey and Coward (1998) examined differences in diabetes knowledge and sources of

diabetes information among African American and Caucasian older women. The study involved a purposive sample of 25 white and 26 black women aged 65 and above with Type 2 diabetes. Educational level, economic status, transportation mode and ethnic group were examined in relation to both diabetes knowledge, measured by the Diabetes Knowledge Test (DKT), and sources of diabetes information, measured by self-report. African Americans scored lower on the DKT (36% correct) than the Caucasian group (41.5% correct). It important to note that neither group scored close to the mean score reported by a sample of Type 2 patients of comparable ages (66% correct). Differences in the use of "informal networks" (family and friends instead of health professionals) were different between the groups, with more African American women found to rely on informal networks (46.2%) than Caucasian women (12.0%). Other sources of information reported were health care providers, written information, TV/radio and churches. A lower than average literacy level was found to be a major factor in diabetes education in this study. However, the finding that high-risk African American women relied on family and friends instead of health care professionals for diabetes management information was a significant finding.

Another study indicated a cultural impact of perceptions of women African American with implications for diabetes management. Liburd, Anderson, Edgar and Jack (1999) examined the perceptions of body shape and size in black women with diabetes to gain insight into cultural factors that might play a role in obesity in that population. This qualitative, focus group study took place in a large southern city and included 33 women with an average age of 50, and annual incomes of less than

$20,000. Study participants reported to prefer middle to small body size for themselves, but stated that a middle to large body size was considered more acceptable by their culture, which they felt was influenced by family, friends and the media. Interestingly, information provided by health care sources did not influence attitudes related to weight, even though the majority of participants were being actively treated for Type 2 diabetes.

Anderson-Loftin and Moneyham (2000) explored factors related to diabetes management over time in low income African-American women. The qualitative study that used interview content analysis of 22 women in focus groups revealed that the processes the women employed in learning to live with diabetes were influenced by social support, good relationships with health care providers, access to services and culturally sensitive support services.

Summary

Studies pertaining to the background variables of gender, age and race as they related to self-management of Type 2 diabetes were examined in this section. Physiological changes that impact diabetes control, which are a result of the disease, were shown to result in situations that directly impacted the individual and diabetes control.

Studies have shown that insulin response can be mediated through diet changes and routine exercising, especially in black women (Agurs-Collins, Kumanyika, Ten-Have & Adams-Campbell, 1997). Hormonal changes in middle-aged women have also shown to be influential in diabetes control. Middle-aged women with Type 2 diabetes

vary in life stresses and abilities to manage those stresses, which could be impacted by the demands of managing a chronic disease (Browne, 1998). To date, no studies have been reported that have examined women with Type 2 diabetes on the basis of their differentiation by middle-age and older age group, event though physical and psycho/social factors may vary in these groups and their abilities to self-manage their disease. This study will examine the background variables of age (middle-age vs. older age) and race in a population of women with Type 2 diabetes, in relation to their health outcome of adherence to their recommended care regimen of diabetes self-management.

<div align="center">Social Influences</div>

Educational level and social support have been examined in relation to outcomes in Type 2 diabetes clients. However, results of studies to date offer conflicting information regarding the role of these factors in middle aged and older women.

Education

Some studies related to diabetes management have measured participants' educational level as a means of describing and comparing groups for differences, rather than in relation to outcomes (Fitzgerald, Anderson, Gruppen & Davis, 1998; Sadur, et al, 1999; Walker, 1988). However, gerontology researchers report that educational level correlates with health outcomes for the majority of Americans (Haber, 1999). In a nursing study that examined correlates of healthy behaviors in adults, Walker, Volkan, Sechrist and Pender (1988), found that education level

strongly correlated with health promoting behaviors and the dimension of self-actualization, especially in older adults. However, Ruggiero and colleagues (1997) examined educational level in their comparative analysis of diabetes self-management in both insulin dependent and non-insulin dependent adults with diabetes (n= 2,056) and found no significant relationships. To date, educational level has not shown to be a strong predictor of self-management of diabetes. In fact, in the culturally sensitive intervention study conducted by Agurs-Collins and colleagues in 1997, only 60% of the older, African American participants with Type 2 diabetes had completed high school. Interestingly, the successful outcomes of the participants, especially the women, were impressive and not related to educational status.

A different approach to investigate the effect of education in diabetes clients was taken by other researchers. Wamala and colleagues (1999) examined the association between the metabolic syndrome (Type 2 diabetes, hypertension, obesity and dyslipidemia) and education levels among women with Type 2 diabetes, from a physiological perspective. Findings indicated that the metabolic syndrome was related to educational level of the women in their study; with lower education associated with higher risk of the syndrome. No other reports of educational levels of middle-age and older women in relation to their adherence to self-management of a diabetes regimen were found.

Social Support

Social support for women with diabetes is not a simple factor to examine in relation to health outcomes of the client. African American women reportedly have

strong informal support networks that extend beyond immediate family (Hatch, 1991). Networks sometimes include support for unhealthy behaviors that is in conflict with recommended diabetes management regimens. The study by Liburd, Anderson, Edgar and Jack (1999) found that African American women more often took advice from their friends, families and church members rather than health care professionals in relation to their diabetes management. In a qualitative study of African American women with Type 2 diabetes by Samuel-Hodge and colleagues (2000), under the psychosocial category of social support, the themes of "instrumental support from daughters" and "God as a source of emotional support" (p. 929) emerged. The 70 women who participated in 10 focus groups stated that they relied on their daughters and other adult female family members to help them accomplish tasks in dealing with diabetes management, but relied on their relationship with God for emotional support.

The successful intervention study by Agurs-Collins and colleagues (1997) that utilized a culturally sensitive program for obese, African American older adults also demonstrated the efficacy of social support of a peer group while clients were learning self-management strategies. Connell (1991) based her study of psychosocial contexts of diabetes in older adulthood on the assumption that "diabetes-specific social support is a stronger determinant of self-care behavior than general measures of overall perceived support" (p. 369), reasoning that social support increases regimen adherence. However, findings from Connell's study of 191 community dwelling older adults with Type 2 diabetes revealed that less than one-third of the participants reported wanting any help with their diabetes management from family and friends.

Fitzgerald, Anderson, Funnell and colleagues (1997) concluded after their study of the impact of dietary restrictions on African American and Caucasians with Type 2 diabetes, that "the relationship between social support and adherence is not always straightforward and it is not clear how different types of support and network composition affect adherence" (p. 46). Landis (1996) studied uncertainty, spiritual well-being, and psychosocial adjustment to coping with diabetes in 94 community dwelling adults and found that social support from family and friends was a major factor in successful adjustment to the disease. However, Walker (1999) reported, "social support has not been measured consistently." (p.21) in reference to diabetes outcomes studies; therefore, more information is needed. The relationship of social support to diabetes self-management in middle-age and older adult women with Type 2 diabetes was not reported in the literature.

<div align="center">Environmental Resources</div>

Income and Insurance

Daily diabetes care regimens include blood glucose testing and other items such as medications that are costly. The average cost of once a day blood glucose testing alone is approximately $35.00/month. More frequent blood glucose monitoring, high costs of medications and office visits to health care professionals can cost thousands of dollars each year (American Diabetes Association, 1998b). Therefore, diabetes self-management is, in actuality, linked to the ability of the client to pay. If diabetes clients are insured adequately, the burden is not as high as when they are not. Descriptive studies related to high costs of diabetes care, linked to

morbidity, were found in the literature; however, only one study was found that examined diabetes patients' financial resources in relation to their ability to manage their disease. Ruggiero and colleagues (1997) examined financial resources of participants in their study that included both men and women with Type 1 and Type 2 diabetes, reporting that persons with Medicare and Medicaid had significantly higher levels of diabetes self-management.

The American Diabetes Association conducted a study in 1997 that examined all sources of payment for the $98 billion dollars spent in 1997 for the treatment of diabetes and related complications. This study, utilizing a number of government and private sources of data, found that more than 10 million dollars was spent by persons with diabetes from out-of-pocket resources in that year. Only Medicare ($25 million) and private insurance ($19 million) spent more on costs of diabetes care, than those persons without insurance, with Medicaid paying less ($9 million) overall than those individuals. The study included records from 31,887 individuals ages 45-64 years and 39,260 individuals ages 65 and above. Older women had medical expenditures 1.6 times that of older men. Information from this study illustrates that not all persons with diabetes who are expected to self manage their disease have insurance to pay for that management. Therefore, it is important to consider the factor of insurance and income in a comprehensive analysis of factors related to diabetes self-management, especially in a population of women, who are threatened with lower socioeconomic status as they age (Haber, 1999). Studies that addressed the relationship of insurance and diabetes self-management in middle-aged and older adult women with Type 2

diabetes were not found in the literature. This study will examine the relationship between the environmental resources of income and insurance and self-management of diabetes in middle-aged and older adult women.

**Elements of Client Singularity: Personal Response Variables**

<u>Intrinsic Motivation</u>

Studies have examined motivation in relation to health outcomes; however, few focused specifically on women with diabetes. Several studies addressed the issue for older women in general. Other studies examined motivation equated with beliefs of self-efficacy expectation. One study in older women revealed the influence of intrinsic motivation on exercise behaviors. Conn (1997) found that older women who were motivated to exercise on a routine basis described exercise as part of their self-identification. In this qualitative study involving 30 community dwelling older women, three factors were identified as being influential on beliefs of the women's ability to exercise: social influences, perceived psycho/social benefits and the presence of joint problems. Women, who reported they considered exercise to be a part of their lives and a part of their socialization with others, reported more positive beliefs in their abilities to exercise. Those who exercised sporadically reported lower beliefs in their abilities to exercise at all. One stated implication of the findings of this study was for nurses who plan exercise interventions with clients, to be aware of the need to incorporate the activities into the person's social network. Older adult women with Type 2 diabetes are encouraged to engage in walking as exercise by most health professionals.

In another study, Conn (1998) addressed the issue of low incidence of exercise in older adults in relation to self-efficacy expectation in a sample of 147 (ages 65-100) community dwelling elders. Social cognitive theory, based on Bandura's interactional model of human behavior (Bandura, 1997), served as the framework for the study. The objective of the study was to test the predictive ability of a model of exercise among older adults. The data for the study were collected by interview included: lifelong leisure activities and previous exercise behavior, exercise outcome expectancies, perceived barriers to exercise and exercise self-efficacy expectations, as well as perceived health. Self-efficacy expectations were demonstrated to have a statistically significant effect on exercise behavior and an intervening effect between age, barriers, and life long exercise and current exercise behavior. Perceived barriers were also significantly influential in predicting exercise behaviors. The study's authors suggest that motivation to exercise in older adults is influenced by perceived barriers, in interaction with perceptions of self-efficacy, and that identification of these factors could help to enhance overall outcomes.

Motivation in relation to diabetes outcomes in general has not been examined as much as motivation to exercise, which is an important part of managing Type 2 diabetes. The few studies of motivation in relation to diabetes outcomes have illustrated the need for further investigation. In 1988, Walker studied the relationship of self-monitoring of blood glucose and intrinsic motivation to regimen adherence in adults with diabetes. This descriptive, correlational study involved 71 community-dwelling adults with insulin dependent diabetes. The variables of self-monitoring of

blood glucose (by Self Monitoring Information Tool), intrinsic motivation in health behavior (HSDI), Hgb A1c (by lab assay), and adherence to prescribed regimen (Diabetes Care Profile) were measured. The relationship between intrinsic motivation and regimen adherence was reported to be significant. However, relationships between frequency of blood glucose monitoring and regimen adherence, frequency of monitoring and HgA1c and intrinsic motivation and HgbA1c were not present. The study's author concluded that patients can adhere to a prescribed regimen of care but still have abnormal lab values, but intrinsic motivation might be enhanced by other factors that are not clear.

Intrinsic motivation is one of the elements of client singularity in the IMCHB, and has been included in at least 17 reported studies to date (Carter & Kulbok, 1995). However, intrinsic motivation has not been reported as an influential factor in health outcomes of middle aged or older women. Cox (1986) contends that motivation is not a static concept, rather is expected to change over time, dependent upon intervening factors at different times in life. Therefore, an examination of intrinsic motivation in two different age groups of women who have the same chronic disease of Type 2 diabetes will add to the body of knowledge concerning the relationship of intrinsic motivation to diabetes self-management for these groups.

<center>Cognitive Appraisal</center>

<u>Self-Perception of Health</u>

Cognitive appraisal is viewed by Cox as "responsible for the client's interpretation of an existing health state, the choice behavior that will influence that

health state, and the character of the relationship with a health care provider" (p. 50). Such cognitions "also include one's self-concept, belief systems, social and occupational functioning, values commitments and emotional state" (Cox, 1982, p. 52).

Self reported appraisal of health has been used in studies of various age groups, especially older adults. Cox (1986) used the variable of self-reported health status in measuring the concept of cognitive appraisal in a study of community dwelling older adults that was designed to test the IMCHB. Cox reported that "Self-reported health status has been acknowledged as an excellent measure of true health status in that clinical evaluations often correlate highly with individual's perceptions" (1986, p. 51) In one study, all variables of the elements of client singularity were viewed in relation to self-assessed health and well being in a sample of 380 elders. Cognitive appraisal (health perception), intrinsic motivation (using the HSDI), affective response (measured by general well-being and self report of loneliness) were measured as the dependent variables and subjected to multiple regression techniques. An interesting finding related to self perception (cognitive appraisal) was the association between increased social contact and negative health status perception. Cox reported that age, functional status, symptoms from chronic conditions, social network size and contact with a confidant, as well as income, intrinsic motivation and affective response explained 47% of the variance in health status (Cox, 1986).

The majority of studies of self-perception of health in older adults have been conducted to investigate the relationship of self-rated health to mortality rates. The

basic premise being that the more negative the self-rating (or cognitive appraisal) of health, the more likely the person will die within a certain time frame. Rakowski, Mor & Hiris (1991) predicted mortality within two years with poor self-perceptions of health. Idler, Kasl & Lemke (1990) found in their study of elders from two communities that a negative self-perception of health was associated was significantly associated with a high risk of mortality, even when controlling for multiple demographic and social influences. However, McCallum, Shadbolt & Wang (1994) found that in their study of 1050 Australian mature adults (age 60 and above), women's better self ratings had an "incremental association with survival" (p. 1100), while men with poor self ratings had a significantly worse survival rate over 7 years time. Women's poor self-perception of health was not significantly correlated with mortality.

Generally speaking, poor self-health ratings have been correlated with poor health outcomes (Benyamini, Leventhal & Leventhal, 1999; Ider & Angle, 1990; Ider & Kasl, 1990; Roos & Havens, 1991), and poor health has been linked to poor self-health ratings. In a more expansive evaluation of the concept of self-rated health, other factors of health outcomes have been examined as well. Exercise is one activity that is considered a primary treatment for Type 2 diabetes; therefore, recognizing the diabetes patient's perceptions of exercise and their ability to adhere to recommended plans is important, especially in older adults (American Diabetes Association, 2000b).

In the realm of diabetes self-management, the client's' perceptions of self are important. In view of the fact that a person with diabetes must perform self

management daily, perceptions, or cognitive appraisals, of themselves, their health and potential health outcomes, which are inter-related (Cox, 1982), should be considered. Diabetes management is life-long and the tediousness of constant vigilance that is required can affect a person's self-perception, and a negative self-perception can also affect self-management abilities. Therefore, an analysis of how the client regards their health in relation to their diabetes self-management can offer valuable information to the health care professional working with such clients.

Glasgow, Hampson, Strycker & Ruggiero (1997) studied personal beliefs (perceptions) and social-environmental barriers in relation to diabetes management in a study of 2,056 adults in the United States. The mean age of the sample was 59 years, with 62% being female. Only 100 African Americans were in the sample. Eighty-six percent of the sample had Type 2 diabetes, and 56% were on insulin. Participants were questioned in regards to their beliefs about treatment effectiveness in the areas of physical activity, glucose testing, recording glucose results, taking medication, checking feet and eating low fat foods. Perceptions of treatment effectiveness were shown to be the strongest predictor of self-management across the three areas ($p <$ 0.001). Beliefs about the seriousness of diabetes were not predictive of any aspect of self-management. The researchers reported that a weakness of the study was reliance on self-report measures rather than a more reliable outcome measure, such as blood glucose readings or Hgb A1c (Glasgow, Hampson, Strycker & Ruggiero, (1997).

Diabetes Understanding

Walker (1999) reported that diabetes understanding could potentially be affected by literacy level, ageing factors, ethnicity or culture, gender and personal choice to know on the part of the client. Some have reported that knowledge of diabetes and self-care strategies alone may not be enough to improve health outcomes of those with diabetes. Almost 15 years ago Bloomgarten and colleagues (1987) reported that their randomized controlled trial involving 235 clients with diabetes did not find that knowledge of diabetes related to improved glucose control. However, a qualitative study of 10 persons with Type 2 diabetes by Sullivan and Joseph (1998) revealed that a wide variation was shown by the participants in their levels of understanding about diabetes self-management. A meta-analysis of research related to adherence in chronic disease Dunbar-Jacob, Erlen, Schlenk, Ryan, Sereika & Dowell, 2000) found that studies examining patient knowledge of a health topic in relation to their adherence to recommended outcomes yielded variable results. Brown conducted a meta-analysis of the effects of diabetes education in 1988 and again in 1990 and reported some studies did show that increased diabetes knowledge resulted in increased diabetes self-management. Studies were not found that examined the relationship of diabetes understanding and diabetes self-management in middle-age and older adult women with Type 2 diabetes.

## Affective Response

<u>Attitude</u>

Attitudes towards diabetes are emotional responses that can affect overall outcomes (Anderson, et al, 1995). In one study of 1201 patients with Type 2 diabetes, attitude was correlated with adherence to self-care regimen. The participants of this study were divided into groups of low adherence or high adherence. Those with high adherence level were shown to have attitudes towards diabetes management that more closely agreed with the accepted standards of care, and those of health professionals. The researchers concluded that attitudes of diabetes patients should be assessed when planning a program of diabetes management.

Hunt, Valenzuela and Pugh (1997) examined the cultural impact on attitudes towards diabetes in their qualitative study of 44 low-income Mexican Americans with the disease. Findings from this study indicated that negative attitudes towards diabetes self management (resulting in lower levels of self management) were closely related to negative impressions given by health care professionals, such as pain from insulin injections is inevitable, diabetes management is difficult, and most importantly, complications are serious and result from failure of the patient.

In another culturally related study concerning diabetes management, Fitzgerald and colleagues (1997) reported a link between regimen adherence and attitudes in African-American patients with Type 2 diabetes. The purpose of the study was to examine the relationship of self-reported adherence to a diabetes diet to social and psychological factors of diabetes in both African-American and Caucasian patients.

Findings of the study indicated that for African Americans with diabetes, negative attitudes were significantly related to poor dietary adherence (p < .01). Among Caucasians, a strong positive correlation was found between diet adherence and support, but not attitudes.

Stress

Wulsin & Jacobson (1998) report that "stress is one of the many factors that may interfere with glycemic control" (p.78) in persons with diabetes in two ways. One way is that stress triggers release of hormones that interfere with glycemic control and the second way is that persons under stress may alter their behavior in ways that are detrimental to their health, such as neglecting self-care, altering eating patterns or even resorting to substance abuse. A literature search for research related to stress and women with diabetes only resulted in one article on the topic; an abstract of a doctoral dissertation. The doctoral study was an analysis of health status among diabetic and non-diabetic women at mid-life. The study examined stress, sense of coherence, health promoting life-style, and perceived health status within groups of mid-life women with and without diabetes. Among the outcomes of the study was that women with diabetes were found to have significantly lower levels of perceived health status and significantly higher levels of stress than women without diabetes (Philipp, 1994). The study did not address diabetes outcomes.

A total of 99 studies that examined stress in persons with diabetes were found in professional diabetes literature, addressing a wide range of stress topics and age ranges of subjects, however only one was found to specifically address issues of self-

management in women. Samuel-Hodge and colleagues (2000) examined influences in day-to-day self-management of Type 2 diabetes in 70 African American women in the south in a qualitative study with focus groups. A major finding was that general life stress was an influential factor for the population studied. Study participants reported that they suffered a great deal of stress in their lives, not necessarily related to their diabetes. It was also reported that 3 categories of stress were reported: stress related to life change, multi-caregiving roles and health. The participants, whose ages ranged from 35 to 65+, described different levels of stress at different life stages: those older and retired reported less stress and those younger, working and with many care-giving responsibilities reported more stress. The African American women in the study also reported that stress affected their ability to self-manage their disease.

The remainder of studies of stress and diabetes in the literature were concerned with patients with Type 1 diabetes, gestational diabetes, tissue oxidative stress and other topics not pertaining to women with Type 2 diabetes. Surwit, Schneider & Feinglos (1992) report that the effect of stress on diabetes in humans is still being studied and not well understood. The relationship of stress to the behavioral outcome of diabetes self-management in middle-age and older adult women is not well understood as well. Additional studies are needed in this area of diabetes research.

Summary

Perceptive response in relation to health is a complex, inter-relational construct that encompasses a person's motivational response, cognitive appraisal of and affective response towards a health threat. The literature related to factors of

perceptive response of middle-aged and older adults in relation to health outcomes is diverse, but findings were congruent in that the overall impression that poor health results in negative attitudes, poor perceptions and lower levels of motivation to practice healthy behaviors. However, incongruent findings were reported for women. Negative self-perceptions of health did not predict mortality, and gerontology experts report that women live longer and are more positive in their health behaviors as they age (Haber, 1999). Knowledge of diabetes and diabetes understanding were not found to produce consistent, positive results in relation to diabetes self-management.

Research concerning attitude in relation to diabetes self-management varied in outcomes as well. Whereas some studies found attitude affected diabetes self-management, others did not report such findings. Studies that examined the relationship of attitude and diabetes self-management in middle-age and older adult women at different life stages were not reported.

Stress was found to be related to problems with diabetes self management in one study of African American women of different ages, with older women reporting less stress than that of younger women with more responsibilities. The majority of studies involved a wide range of ages, without a clear differentiation between age groups. Perceptive responses in relation to health behaviors of older women and middle-aged women, at different life stages, have not been reported in the same study. No studies were found that examined perceptive responses in relation to self-management of Type 2 diabetes in a comparative analysis of middle-aged and older adult women with the disease.

## Elements of Client/ Professional Interaction

<u>Health Information</u>

<u>Diabetes Education</u>

Diabetes education as an intervention to teach clients to manage their disease is the cornerstone of diabetes care (American Diabetes Association, 1999). In 1999 the Diabetes Quality Improvement Project (DQIP) Committee reported that a pilot survey of diabetes patients indicated that a more comprehensive effort is needed in the area of teaching diabetes clients what to do to care for themselves (American Diabetes Association, 1999). Under the IMCHB conceptual framework, the provision of health information is considered a primary intervention that impacts health outcomes of clients. For community-dwelling clients who are expected to self-manage Type 2 diabetes, their ability to be successful is impacted by their knowledge of a complex disease, which is compromised if they do not receive health education. Different methods of diabetes education are employed by health professionals and have been reported in the literature; however, not all studies examine client outcomes of disease self-management. Literature reviewed in this section concerns studies examining health outcomes of diabetes clients related to diabetes education.

Sadur and colleagues (1999) reported a diabetes education program that utilized a team approach with diabetes nurse educators having primary roles. In their randomized study, 185 adults with diabetes (Type 1 or 2) were assigned to intervention or control group and followed for 6 months. The intervention group received individualized assessment, referral to specialists (nutritionists, psychologists,

podiatrists, etc), teaching and collaborative care planning with frequent follow up contacts by the nurse educators, in collaboration with team physicians. The control group continued usual care from their primary care physicians. Lab values and diabetes knowledge, self-management practices and satisfaction with care were measured before and after the 6-month study. Outcomes of the study revealed a significant difference in nutrition visits ($p<0.001$), home-blood glucose monitoring, managing blood glucose at home, satisfaction with care and post-intervention average blood glucose levels in the intervention vs. control groups. Hospitalizations of both groups were significantly different as well, with the intervention group having 28 admissions, compared to 41 for the control group. Gender differences were not reported. The mean age of participants was 56 in the intervention group and 53 in the control group. Results of this study demonstrate the difference in self-management of diabetes by clients who are provided a comprehensive education program as opposed to those who receive routine care.

A study by Harris (2000) that examined data from the NHANES III national survey did not examine diabetes education, but rather questioned the assumption that it takes place. In the secondary analysis that included 733 adults with Type 2 diabetes, 94.8% were reported to have access to a source of primary care, and yet, health outcomes for the group were far below the national standards. Only 44% of those being treated with insulin reported daily self-monitoring of blood glucose, while only 6.6% of those not taking insulin reported doing so. At the same time, 58% of the participants had average blood glucose levels over the recommended rate. Over 42%

of the participants in the study rated their health as either "fair" or "poor". The conclusion of the researcher was that, in spite of a high level of access to care in the population studied, poor diabetes outcomes were evident. Questions were raised as to whether diabetes education is being provided to community dwelling adults with Type 2 diabetes.

Self-management of diabetes by individuals involves the aspect of personal commitment on the part of the client, which can vary depending on a variety of factors, including diabetes education. Ruggiero and colleagues (1997) examined diabetes self-management behaviors in a large population of individuals with both Type 1 and Type 2 diabetes. A total of 2,056 participants completed surveys providing comprehensive data concerning their health state and diabetes self-management practices. Survey data was divided into three groups by treatment and type of diabetes: Type 1, insulin treated (13,8%); Type 2, not on insulin (30.8%) and Type 2, on insulin (55.9%) with self- management behaviors and demographics compared among the groups. Differences were found in demographic information as expected, with younger respondents being more active in the work force and having Type 1 diabetes. Significant differences were found across groups for self-management practices: those respondents with type 2 diabetes treated with insulin performed glucose testing, diet adherence and exercise on a regular basis more than others (p < 0.00001 reported for each). In general, self-management behaviors improved with age, except for those with Type 2 diabetes who were not on insulin. Respondents with Type 2 diabetes who were not treated with insulin reported the lowest levels of self-management.

Differences were examined in relation to the diabetes education provided the individual groups. Forty-four percent of the respondents with Type 2 diabetes not treated with insulin reported that they did not receive instructions in diabetes self-management, and did not perceive the disease to be important. Less than half of all respondents reported knowledge of the latest research findings related to role of blood glucose control in prevention of complications. Significant findings from this study were that a high percentage of persons with Type 2 diabetes (not on insulin) were not provided with health education, and did not perceive the disease to be important, whereas those persons treated with insulin displayed a higher level of self-management of the disease.

Diabetes education is often offered as a one-time intervention when a person is first diagnosed with the disease, and yet, changes occur that warrant continued education as well. Yung and colleagues (1998) examined age related decline of diabetes knowledge and hypoglycemic symptoms of older adults with Type 2 diabetes in China. Their study of 126 patients with a mean age of 64.3 years, assessed patients' knowledge and adherence to medical advice, as well as knowledge of hypoglycemic symptoms. Findings indicated that overall knowledge of diabetes declined with age with all participants, but more significantly for those who had not attended a class of instruction. Adherence to recommended regimen of care was also significantly less for those who did not receive diabetes education.

Type 2 diabetes is difficult to manage. For those clients who do not receive diabetes education, self-management of this complex disease is extremely difficult.

However, many behavioral studies question self-management practices of clients, without questioning whether the person received diabetes education. The provision of health information is a primary intervention that impacts health outcomes in clients. In this study, middle-aged and older women with type 2 diabetes who are expected to self- manage their disease at home will be asked if they received diabetes education. This information will provide a more comprehensive analysis of the overall health outcomes of this population in accordance with the IMCHB.

### Previous Use of the Interaction Model of Client Health Behavior

The Interaction Model of Client Health Behavior (IMCHB) was developed by Cox while she was as a doctoral student in 1982 and later published in the literature. Since that date studies utilizing the model have focused on a variety of client health outcomes, particularly in relation to elements of client singularity. In 1995, Carter and Kulbok published an evaluation of the first decade of research using the IMCHB. They reported that many study designs have not been consistent with the entire model, but rather have inferred linkages between concepts that are not explicit in the original model. Carter and Kulbok noted that researchers using the Cox model designed studies that examined a variety of elements of client singularity in relation to different health outcomes. Studies that did address the interaction element of the model were limited in scope. Only one study (Brown, 1992) was found to address the three components of the interaction element of the model.

The evaluation of research using the IMCHB reported by Carter and Kulbok listed 24 studies that examined a variety of different population, using both

quantitative and qualitative methods. The populations of interest by number of studies reported included women (8), adults (7), children (3) and elders (6), with one study involving adults with diabetes. From the introduction of the model until the present time studies have been ongoing and varied in focus. The latest study found in the literature examined incontinence in rural women (Doughtery, et al, 1998). Cox, (personal interview, 1999), has reported that the IMCHB has been shown to be an appropriate conceptual model to use in examining factors related to health in aging adults, women, and persons with diabetes.

## Summary of Literature Review

A review of the literature of factors impacting diabetes self-management of middle-aged and older adult women revealed a lack of knowledge in this area of nursing science. Middle-aged and older adult women with Type 2 diabetes were shown to be at risk for poor health outcomes due to a variety of factors. Gender, race and age have been shown to impact diabetes outcomes, but no studies examined the differences in ages among women as factors of influence in diabetes self management. Studies examining age related physiological changes in women that impact diabetes control and outcomes highlighted the need to consider the age as a factor in diabetes self-management. No studies examined diabetes self-management in women in the menopausal age range of 50-64 as a group.

Social influences and environmental resources related to diabetes self-management were implicated in a variety of studies. African American women have been reported to be influenced by strong family and social network support in diabetes

self- management, but that has not shown to be significant for Caucasian women. The influence of social support on diabetes self-management among groups of women who are at different stages of life development were not reported in the literature. Income and insurance have been shown to be influential in diabetes outcomes; however, studies involving older women have been influenced by all women 65 and above having access to Medicare. Women in middle age may not have the same access to health insurance. Lack of health insurance has been shown to result in high costs of care for those with diabetes, and yet, no studies were found that examined income and insurance in middle aged women with diabetes in relation to their diabetes self management.

Personal responses related to diabetes self management: intrinsic motivation, self-perception, diabetes understanding, attitudes and stress have been shown to be influential in health behaviors for persons with diabetes. Older adult women with diabetes have been reported to be highly motivated to practice healthy habits, including diabetes self-management. Self perception of older adult women in relation to health outcomes have shown that those who are more positive are more likely to manage chronic illnesses better and live longer. The relationship of diabetes knowledge and understanding and diabetes self-management has not been evaluated in middle-age and older community dwelling women. Attitudes have been shown to differ culturally in relation to diabetes management. However, no studies were found that examined the relationship of personal responses of middle-aged women with Type

2 diabetes in relation to diabetes self-management in comparison with older adult women.

The literature reviewed in preparation for this study revealed a lack of information concerning factors related to diabetes self-management of women in general. No studies were found that examined differences by age category for women with Type 2 diabetes, even though physiological changes that occur in women with aging, and stress specific to stage of life development are believed to affect diabetes control (Anderson, et al., 1995). This study will add to the body of knowledge concerning diabetes self-management of women with Type 2 diabetes and will offer new information concerning age-related differences in diabetes self management among community-dwelling, middle-aged and older adult women.

# CHAPTER 3

## METHODOLOGY

The purpose of this study was to examine diabetes self-management in middle- aged and older adult women with Type 2 diabetes and to examine differences between the two groups. The Interaction Model of Client Health Behavior (Cox, 1982) provided the conceptual framework for the study. Elements of client singularity (background variables of demographic characteristics, social influences and environmental resources) and elements of perceptive response, (intrinsic motivation, cognitive appraisal and affective response) were examined in relation to participants' health outcome of adherence to a recommended regimen of diabetes self-management. An element of client/health professional interaction, health education, was viewed in this study as diabetes education, and examined in relation to diabetes self-management in middle-aged and older adult women with Type 2 diabetes.

### The Design of the Study

This non-experimental, quantitative study was correlational in design. A cross sectional method of surveying women in two specific age groups; middle age (50-64) and older age (65 and above) was utilized. Brink and Wood (1994) discuss that a correlational, descriptive study is an appropriate research design to use when the researcher seeks to examine and explain relationships among variables based on a theoretical or conceptual base. It is also useful when previous literature has not clarified the relationships through studies concerning the concepts and population of interest. The cross-sectional approach is a method of collecting data at one point in

time and is reportedly "quite useful in determining if two or more variables are related" (Spector, 1981, p.33).

## Sampling and Setting

The study was conducted in the southern Appalachian area in the United States, and targeted middle-aged and older adult women with Type 2 diabetes in two mid-sized metropolitan cities, and one rural community. The sample consisted of community-dwelling women age 50 and above with the diagnosis of Type 2 diabetes. The sample was divided into two groups; middle age (ages 50-64) and older women (ages 65 & above). Criteria for inclusion, in addition to age and gender, were either black or white race, the ability to comprehend and respond in English, and read on at least a 6th grade level (reading level of the instruments). Another criterion for inclusion was that the participants had to be personally responsible for self-management of their diabetes, and under the care of a health care professional (e.g. physician or nurse practitioner) who directed the treatment regimen. Participants were not excluded based on their treatment regimen (insulin dependent or not).

## Sample Size

Previous studies of this nature have not reported effect size for comparison. Based the power analysis in consideration of the analyses of the data, the number of participants needed in each group was 64 for an effect size of .30, power of .80 and at the significance level of $\alpha$= .05 (Polit & Hungler, 1995). Purposive sampling was implemented to achieve the necessary numbers of participants in each group. At the

completion of the data collection period 78 middle-aged women were recruited and 66 older women.

Five surveys from the middle-age group were found to be from women younger than age 50 and therefore excluded. Two surveys from the older age group were less than half complete and were excluded, as well as one survey determined to be from a 69 year old woman with Type 1 diabetes rather than Type 2. The number of surveys used in the analysis was 73 in the middle-age group and 63 in the older age group, for a sample size of 136.

<u>Sample Selection and Recruitment</u>

Participants were recruited by distribution of materials and personal contact with the researcher at three Senior Neighbor congregational meal sites, three hospitals, one senior social club, and seven offices of nurse practitioners and physicians.

Recruitment strategies also included announcements of the study in a woman's monthly paper, church bulletins and through email and newsletter communication at two major companies in one of the metropolitan areas. Recruitment of minority women in the study was accomplished by the researcher's attendance at community meetings organized for black women and distribution of information at key sites in an inner city area with high population of black families. In addition, an announcement specifically targeting women age 65 and above was placed in the health section of a local newspaper to enhance participation of that age group.

Another recruitment strategy was a mailing to randomly selected physicians' offices and all nurse practitioners' offices in one metropolitan area. Those who responded were visited by the researcher and further information provided.

In total, 392 survey packets were distributed either by mail, in person, or by health professionals at practice sites. Of that number, 144 were returned by mail, for a return rate of 36.7%. Two hundred packets were mailed to women in a rural area who were clients of a local hospital's diabetes program. An additional 95 packets were hand distributed to health professionals' offices and other sites visited by the researcher where packets were requested. Ninety-seven packets were mailed to women who called the researcher requesting to participate in the survey. It was not possible to determine the number who returned the surveys in relation to the number who requested the study packets, as no return addresses were to be included on the return envelope.

**Human Subjects Procedures**

In accordance with guidelines for research involving human subjects at the University of Tennessee/ Knoxville, a completed Form A was provided to the Human Subjects Review Committee at the College of Nursing. Recruitment efforts were started after approval was obtained by the appropriate Human Subjects Committee (s) and receipt of permission to begin the study. As agreed in the proposal, the researcher explained the nature, process and importance of the study, as well as the potential risks, to all participants by way of an introductory letter that was included in the survey packets. The same information was also given by telephone, or in person, to

those who requested information after receiving an invitation to participate. All participants were assured of confidentiality in the study and informed that they should not reveal their names or any other identifying information in the course of the study. Those requesting to participate were informed that anonymity could not be assured by the researcher, as the potential participants will be asked to provide an address to send the packet of information and surveys, but that the information would be sent to "Southern Woman" at their address. Only 5 participants asked that their name not be included on the envelope. The remainder of the women contacting the researcher insisted that their real names be used. A list of the addresses was retained in a locked file by the researcher to be destroyed at the end of the study. Potential participants were instructed to not add their address to the return envelope, which included the researcher's address.

Participants were informed that all information gained from this study is to be reported in the aggregate only, with no addresses or other contact information revealed to anyone by the researcher, who was the only person sending and/or receiving the information. Participants were told that they could withdraw from the study at any time, without consequences. The return of the surveys was considered informed consent of the participant, as was stated on the introductory letter included in the study packet. Potential participants who contacted the researcher by telephone were assured that a telephone identification system was not in place that would reveal their identity.

Risks in this non-experimental study were considered to be minimal. Potential risks, along with the purpose and methodology of the study, as well as potential benefits was outlined in the application for approval of the study and included in the letter to potential participants. A potential risk to the study participants was expected to include emotional upset from having questions asked that relate to their personal disease self-management, especially if they were not managing their diabetes well. Counseling related to diabetes self-management, as a result of emotional trauma from reading the survey, would have been provided if requested, but was not. All materials were written and formatted to not exceed sixth grade reading level. However, frustration due to reading difficulties was considered a potential risk. No feedback information was received in relation to the readability of the materials. All participants were informed that the surveys could be completed by personal or telephone interview with the researcher if they so choose, but none did so.

Surveys were mailed to a secure post office box in the name of the researcher and collected weekly. The surveys were kept in a locked file at the home of the researcher. At the completion of the analysis, all data will be archived for a period of three years and kept in a secure file. No surveys were read by persons other than the researcher, who personally entered the data on a secure home computer. The dissertation chairperson had access to, and reviewed, portions of the data.

As an incentive to participate in the study a gold or silver dollar was attached to an original pamphlet on tips for women with Type 2 diabetes that was written by the researcher and included in the study packet. A statement on the cover letter

informed potential participants that they could keep the pamphlet and dollar even if they chose not to participate.

## Data Collection

Data was collected via survey after contact was initiated by the potential participant to the researcher by telephone or in person at the public events. The researcher's contact information was included in the written information distributed in the community. A temporary telephone line with a messaging service, but without a caller identification service, was established at the home of the researcher for the duration of the study and available for the potential participants. Potential participants were asked to leave a telephone contact number to be called by the researcher, who returned the calls personally and determined the person's eligibility for the study. Women who qualified and agreed to participate were told that they would be mailed a packet of information addressed to "Southern Woman" at the address provided by the caller. Only five of the callers asked that the packets be sent to that name. All others requested that their real names be used in the mailing. The packet included an introductory letter from the researcher that explained the purpose, benefits and possible risk from participating in the study. The survey instruments included in the packet consisted of the Health Self Determinism Index and a questionnaire developed from selected scales and questions from the Diabetes Care Profile. Also included were a demographic data sheet and cover sheet for the instruments with the statement that consent to participate was implied by the return of the surveys. Completion time of the instruments was estimated to take approximately fifteen to thirty minutes.

Confirmation was received from one of the participants that the actual time for her was ten minutes. A stamped, self-addressed envelope, addressed to the researcher, was also included in the packet for the participants to return the surveys. The survey was printed on pink paper for ease of reading and to reduce the cost of the return mailing. On the return envelope a sticker instructed the participants to include the pink pages only in the envelope.

Participant packets were given to women met by the researcher at the public speaking events, and to those who expressed an interest in participating in the study. They were offered the option of returning the surveys to the researcher by mail, in person, or to be interviewed in person, or by telephone. All women who telephoned the researcher were also given the opportunity to answer the questions by telephone survey if they so chose. None of the women chose to complete the surveys in person, or by telephone. All surveys received were by mail.

Returned surveys that were not acceptable (incomplete data, age not in range, race not black or white) were not used in the analyses. A weekly count of the returned surveys that were acceptable determined the recruitment strategies for the remainder of the study. This "wave" technique (Cresswell, 1994) of timely checks on progress assures an adequate sample for the study. Recruitment efforts were intensified as weeks progressed and rates of survey returns were found to be inadequate. Two weeks after surveys were mailed a post-card was sent as a reminder to the same addresses, and thanking the participants for their assistance with the research. Only those women who contacted the researcher directly were sent the cards. Addresses

weren't available for those who received the study packets from other sources, such as

nurse practitioners, and diabetes educators.

## Measurement

Two instruments were used in this study. Demographic data was obtained

using questions from section I of the Diabetes Care Profile 2.0 (DCP) (Michigan

Diabetes Training & Research Center, 2000). The demographic questions from the

DCP were reformatted and re-numbered for ease of reading and put on the first

section of the DCP questionnaire. The Health Self Determinism Index (Cox, 1986)

was used to measure intrinsic motivation and was included last in the survey packet.

Selected questions and scales from the Diabetes Care Profile 2.0 were used to

measure the remainder of the data (Appendix G). Table 1 illustrates variables of the

study under the IMCHB conceptual framework, as well as indicators of the study

variables. Questions and scales from the DCP were formatted on the same

questionnaire for convenience of the participant, with permission from the Michigan

Diabetes Research & Treatment Center.

### Diabetes Care Profile 2.0

The Diabetes Care Profile 2.0 is the latest version of an instrument that was

designed to measure social, psychological and educational needs of diabetes clients.

The original tool was based on the Health Belief Model (HBM) by Janz and Becker

and was designed to measure the four constructs of the model: perceived severity of

the disease, perceived susceptibility to complications, benefits of adherence, and

barriers to adherence (Fitzgerald, Davis, Connell, Funnell & Hiss, 1996). The current

Table 1.    Correspondence of the Elements of the IMCHB to the Study Variables

| Element | Survey Variable | Interpretation |
|---|---|---|
| **Client Singularity: Background variables** | | |
| Demographic characteristics | Age | Expressed by age & DOB |
| | Race | Expressed as White or black |
| Social Influence | Education | Expressed as grade completed |
| | Social Support | Support Received Scale of the DCP 2.0 |
| Environmental resources | Income | Expressed as Income category |
| | Insurance | Expressed as type/ no insurance |
| **Client Singularity: Personal Response variables** | | |
| Intrinsic motivation | Intrinsic motivation | Score representing self-determinism in diabetes self-management (total score of HSDI) |
| Cognitive appraisal | Health status | Score representing self-perception of health (DCP 2.0) |
| | Diabetes understanding | Score representing cognitive appraisal (Understanding Management Practice Scale, DCP 2.0) |
| Affective response | Attitude towards diabetes | Scores representing positive attitudes towards management (Positive Attitude Scale, DCP 2.0) |
| | Stress level | Measured by self-report on visual analog scale |
| **Client/Health Professional Interactions** | | |
| Health information | Diabetes Education | Questions from section III of the DCP 2.0 regarding (Health Education/Advice Received) |
| **Health Outcomes** | | |
| Adherence to recommended care | Diabetes self-management | Scores on the Self Care Adherence Scale of the DCP 2.0 |

DCP contains 14 scales that reflect the basic structure of the original tool, the

Diabetes Educational Profile (DEP), but also includes items that were added to assess

the respondent's ability to self-manage diabetes. Permission to use the tool is obtained

via an online questionnaire. The only stipulation for use of the tool is agreement by

the researcher to acknowledge the Michigan Diabetes Research and Training Center

in all publications pertaining to the research. Permission to use the tool in this

research was obtained from the University of Michigan Diabetes Research and

Treatment Center prior to the beginning of the study.

Validity and Reliability

The 14 scales of the tool have been examined for validity and reliability as

separate constructs within the comprehensive tool and have been reported to be valid

and reliable. In 1996, Fitzgerald, Davis, Connell, Hess, Funnell & Hiss reported two

studies conducted to test the reliability and validity of the DCP scales. The individual

scales were examined for both construct validity and concurrent validity as well as

reliability. In the first study, a total of 440 community-dwelling diabetes patients,

comprising three different groups (type 1, insulin dependent, type 2, non-insulin

dependent and type 2, insulin dependent) participated. It was hypothesized by the

researchers that the more severe the disease (type 1, insulin dependent), the greater

the impact of the disease on the individual, which would be reflected in the various

scale constructs (control, importance of disease, adherence to recommended care,

etc). In addition, construct validity of the scales was tested through correlations of the

physiological measure of HgbA1c to the scales. In this study, HgbA1c levels were

collected at the time of the study. The reliability of each DCP scale was tested by the Cronbach's coefficient alpha. Tests of variance included the F ratio and Tukey's HSD. Scale scores were correlated to HgbAlc levels by Pearson r, with correlations $\geq 0.20$ being considered supportive of construct validity. The resultant reliabilities for the individual scales in the first study ranged from .60 for the Exercise Barriers Scale to .95 for the Long Term Benefits Scale. Validity for the scales was also supported through evidence of significant differences demonstrated among the three groups on 6 of the scales. In the analysis of HgbAlc to scales scores, correlations for three of the scales were significant ($\geq$ .20); Control Problems, Self-Care Ability and Self-Care Adherence. Correlations for the Self-Care Adherence Scale also remained significant after further analysis of the findings by type of diabetes and treatment.

In the second study, the DCP was administered to diabetes patients, and compared to other previously validated scales (Social Provision, CES Depression and the Happiness & Satisfaction). Sixty percent of the sample of 352 adults was women in this study. The responses from participants were separated into the same three groups as mentioned above by type and treatment of diabetes. No physiological data from this sample was collected, but all subjects completed the DCP and each of the three other tools. The three selected tools have constructs similar to the DCP and therefore were considered appropriate to compare. The Cronbach' coefficient alpha's for the standardized scores for each scale ranged from a low of .66 (exercise barriers) to a high of .94 (long-term care benefits). Correlations of the previously validated scales to the DCP scales supported the validity of the DCP scales

(correlations ≥ .30, p≤ .01). The authors of this report concluded, "results of the studies indicate that the DCP is a reliable and valid instrument for measuring the psychosocial factors related to diabetes and its treatment" (Fitzgerald, Davis, Connell, Hess, Funnell, Hiss, 1996, p.208).

A study by Fitzgerald and colleagues (1998) was undertaken to examine the reliability of the DCP 2.0 for use with African American populations, as previous studies assessed participants who were primarily Caucasian. In this study the instrument was used to measure social and psychological factors related to diabetes and its treatment in a sample of African Americans (n=511) and Caucasians (n=235) with type 2 diabetes. The analysis revealed that scale reliabilities for the Caucasian sample ranged from .68 to .96 (average standard deviation of .84 +/- .09)/ Scale reliabilities for the African American group ranged from .70 to .97 (with identical standard deviations). No significant differences were found between the reliabilities of the individual scales of the instrument (p <. 003). The study revealed a significant interaction effect between ethnicity and treatment type, indicated by the Control Problems Scale, the Positive Attitudes Scale, and the Negative Attitudes Scale. The conclusion of the researchers was that the DCP 2.0 is a reliable instrument for both African American and Caucasian patients with type 2 diabetes.

Scales

The individual scales of the DCP 2.0 can be utilized separately for measurement of different constructs. In this study, questions from section I of the Diabetes Care Profile 2.0 were used to collect general demographic information. Age,

as listed in years, date of birth, for clarification, race, grade level completed, income level and insurance type as asked on the DCP were in the first section of the questionnaire. In addition, zip code was included as a measure of relevance for community health implications.

The second section of the questionnaire included individual questions and scales from the DCP that measure the study variables. Section II; question 1 measures general health status. The question requires a self-rating of health on a scale of 1-5, with 1= excellent- 5=poor. On this scale, a lower score indicates a better self-perception of health. This question will be used to measure "cognitive appraisal". Section II of the DCP includes the Support Received Scale. This scale was used to measure social influence. The scale consists of 6 questions, with possible answers ranging from 1=strongly disagree to 5=strongly agree. The scale is scored by the sum of the answers. On this scale, higher scores indicate a higher level of support for diabetes self-management from family and/or friends. Cronbach's reliability coefficients were calculated to determine internal consistency on the Support Received Scale in this study. For the middle-age group the coefficient was .92; for the older age group .90 and for the entire sample it measured .92. These coefficients were higher than previously reported in research (Fitzgerald, Davis, Connell, Hess, Funnell & Hiss, 1996).

Cognitive appraisal was measured through use of the "Understanding Management Practice Scale" of the DCP. This scale is scored by the sum of answers

on 7 questions with answers ranging from 1= poor to 5=excellent. A higher score indicates a better understanding of diabetes management practices.

The Diabetes Understanding scale has been used in conjunction with question 4 in section III of the DCP. Section III of the tool measures "Education/Advice Received" and includes 4 questions concerning health information relating to diabetes management, provided by a health care provider or nurse. Possible responses are "yes" or "no". This scale was used to measure the client/professional interaction of health education provided by health professionals. In this study the researcher chose to measure the Understanding Management Practice Scale on all participants based on the assumption that all women who responded to the survey were expected to self-manage their diabetes whether they received education or not. Examining the stated level of understanding in relation to the measured outcome of diabetes self-management was expected to provide needed information for nurses who work with female diabetes clients. In this study, the reliability coefficients of the Understanding Management Practice scale were found to be .91 for middle-aged women, .92 for older women and .92 for the entire sample. These coefficients compare with the previously reported reliability of .92 for this scale (Fitzgerald, Davis, Connell, Hess, Funnell & Hiss, 1996).

Affective response was measured by the "Positive Attitude Scale", which consists of questions 4,6,8, 9 & 10 from section VIII of the DCP. Possible answers on this scale ranged from 1="strongly disagree" to 5 = "strongly agree". This scale was scored by the sum of responses, with higher scores indicating a more positive attitude

towards a person's ability to manage their diabetes. Reliability coefficients calculated for the Positive Attitude scale in this study were .76 for middle-age women, .80 for the older women and .78 for the entire sample. Previous reliability of this scale was reported to be similar to these results at .80 (Fitzgerald, Davis, Connell, Hess, Funnell & Hiss, 1996).

Finally, the outcome variable, adherence to recommended care, identified in this study as diabetes self management, was measured by the Self Care Adherence Scale of the DCP. This scale is comprised of 4 questions with answers ranging from 1="never" to 5 = "always". The scale is scored by summing the responses, with higher scores indicating higher level of self-management of diabetes. The set of questions on the scale includes one question designed to validate consistency of answers by opposite wording. That question is not calculated in the total score of the other 4 questions. Reliability scores on the Self Care Adherence scale were .65 for middle-age women, .70 for older women and .70 for the entire sample. Reliability scores for this scale in two previous studies were similar (.70 and .70). (Fitzgerald, Davis, Connell, Hess, Funnell & Hiss, 1996).

Previous Usage of the Diabetes Care Profile 2.0

In addition to the three studies examining the validity and reliability of the DCP 2.0, five other studies have been reported in the literature that have used the instrument as a whole or in part. Fitzgerald, Funnell, Arnold, Davis, Aman, Jacober, & Grunberger (1997) examined differences in the impact of dietary restrictions on African Americans and Caucasians. In a related study, Boehm, Schlenk, Funnell,

Powers & Ronis (1997) examined predictors of adherence to dietary recommendations in people with type 2 diabetes through use of scales on the DCP 2.0 pertaining to adherence and attitudes. In a study designed to examine the influence of treatment modality (insulin vs. oral medications vs. diet) and ethnicity in patients with type 2 diabetes, Fitzgerald and colleagues (2000) used all scales of the DCP and found that attitudes towards diabetes were similar for both African Americans and Caucasians in the study. Anderson, Fitzgerald, Wisdom, Davis & Hiss (1997) examined global vs. disease specific quality of life measures in patients with type 2 diabetes using the Short Form 36 and the DCP 2.0. A comparison was made of the two instruments in this study, with the researchers reporting the DCP 2.0 to have acceptable reliability for the individual scales of the tool. The DCP 2.0 was also used in a comparative analysis testing the psychometric properties of the Diabetes Empowerment Scale, due to the previously demonstrated reliability of the DCP 2.0 (Anderson, Funnell, Fitzgerald & Marrero, 2000). The scales from the DCP 2.0 used in this study of community-dwelling middle-aged and older adult women were shown to be comparable in reliability found in previous studies.

<center>Health Self Determinism Index (HSDI)</center>

The Health Self Determinism Index (HSDI) was used to measure the concept intrinsic motivation in this study. The HSDI was developed in 1984 by Cheryl Cox, author of the Interaction Model of Client Health Behavior. The HSDI was designed as a new measure of motivation in health behavior and was based on Deci's cognitive evaluation theory of intrinsic motivation (Cox, 1985). The HSDI originally was a 20-

item questionnaire with a five point Likert scale, but had been revised to 17 items distributed over four sub-scales. The response choices ranged from (1= strongly disagree), to (strongly agree = 5). Eight of the items were worded to represent an intrinsic motivation, and nine are worded to represent an external motivation construct. The items of the instrument were divided among four sub-scales: self-determined health judgments, self-determined health behavior, perceived sense of competency in health matters and responsiveness to internal-external cues. The total score had been reported in other studies as a measure of overall intrinsic motivation and should be calculated as such when scores on the extrinsic motivation items are reversed, with a higher score indicating a higher level of intrinsic motivation. The total score on the instrument was used in this study as a measure of intrinsic motivation.

Validity and Reliability

Content validity of the test items was reported in a pilot test as determined by both graduate students and faculty in nursing and psychology (Cox, 1985). Another pilot test was administered to 31 volunteers ranging from skilled laborers to professionals. The purpose of that test was to ascertain test item ambiguity, establish response variance and to test reliability of the instrument. Cronbach's alpha for the entire tool was established at .82, a respectable value for a new instrument. Adjustments were made to the instrument based on feedback from the pilot studies. A third pilot test was undertaken, using a convenience sample of ten individuals. From

those tests the author reported that response variance and item clarity were established (Cox, 1985).

The initial psychometric testing of the HSDI took place after revisions were made from the pilot studies. For population diversity and more representativeness, the measurement was mailed to 345 community dwelling adults, selected from the telephone directory. The sample size was determined through analytical procedures based on the number of variables and statistical procedures planned. Over-sampling was targeted at 45% in order to offset a poor response rate. Altogether, 202 participants were able to complete the HSDI. Cronbach's alpha was used to determine the internal consistency and homogeneity of the instrument and was reported to be .82. After the first large scale test of the instrument four items were dropped from the total due to poor item-total correlations. The resulting 16-item tool increased the tool's alpha coefficient to .84 after the adjustment (Cox, 1985).

Factor analysis was performed using the RAO extraction method to determine the significant factors. A four-factor solution resulted that explained 56% of the variance. The four factors identified as sub-scales were termed: self-determinism in health judgment, self-determinism in health behavior, perceived competency in health matters and internal/external cue responsiveness. The sub-scales were examined for internal consistency by computation of Cronbach's alpha, with the following results: factor 1= .75, factor 2= .75, factor 3= .67 and factor 4= .69 (Cox, 1985). The findings of psychometric testing indicated that the HSDI was theoretically sound and conceptually supported the multidimensionality of the construct of motivation.

In 1987 Cox, Miller and Mull reported additional psychometric testing of the revised HSDI based on a study of 379 elders in a large mid-western city and its suburbs, measuring intrinsic motivation in relation to selected lifestyle behaviors. In that study the overall reliability of the tool was supported with an alpha coefficient of 0.78. However, as a result of the study, three items of the original 20 item instrument that consistently presented problems and were consequently dropped. The new tool was comprised of 17 of the original items. Questions three, six and sixteen were eliminated, and the original item # 1 that was dropped after the first psychometric evaluation of the tool was added (Cox, Miller & Mull, 1987).

Previous Use of the HSDI

The HSDI has been tested within the conceptual framework of the IMCHB in several studies. As previously stated, in 1985 and 1987 Cox measured the psychometric properties of the tool and found it to be a reliable and valid instrument to measure the construct of intrinsic motivation. In 1986 the HSDI was used in a sample of community-based elders in a study examining their health and well being related to their motivations for health behaviors. One of the studies to test the psychometric properties of the instrument also involved community elders (Cox, Miller & Mull, 1987) and found the instrument to be appropriate to use with this age group.

In 1990 a version of the HSDI was developed to measure intrinsic motivation in children (Cox, Cowell, Marion & Miller), naming that version the HSDI-C. In 1993 the HSDI-C was used in a study involving pre-teen adolescents in measuring

intrinsic motivation in relation to health behaviors in that age group. In 1998 Abel,

Marion & Seraphine adopted the HSDI to study motivation for sexual health among

young adults. The HSDI-S was designed as a gender-neutral instrument measuring

intrinsic motivation. Carter and Kulbok (1995) reported that "the HSDI has been

translated for use with populations speaking Spanish, Chinese, Icelander, Kamir,

Laotian, and Vietnamese" and has clearly demonstrated versatility with various

populations" (p.63). The HSDI in this study was used with a sample of community

dwelling middle-aged and older adult women with type 2 diabetes. Reliability

coefficients calculated for the HSDI in this study were found to be .75 for middle-

aged women, .79 for older women and .77 for the entire sample. The coefficients

were similar to previously reported results.

## Analyses

A descriptive report of the rate of return of mailed and distributed surveys

(respondent/non-respondent analysis) was previously reported. An informal count of

returned surveys by age group was kept by the researcher to aid in recruitment efforts.

Descriptive analyses of all independent variables and the dependent variable

were conducted with the findings presented in table format in chapter four. Statistical

analyses of the data were conducted using the SPSS-PC 10.1 for Windows program.

### Research Questions and Statistical Analyses

1 **Are there differences in diabetes self-management in middle-aged and**

**older adult women with type 2 diabetes?** This question was answered by

comparing the mean scores on the Self-Care Adherence Scale for each group using a t-test.

**2. What are the relationships among background variables and diabetes self-management among middle-aged and older adult women with type 2 diabetes?** To answer this question, bivariate relationships of each of the independent variables and the dependent variable (as measured by the Self-Care Adherence Scale) were examined. A multiple regression, regressing self-care adherence (representing diabetes self-management) on the background variables was also performed. For the analyses, race was coded as 1=black and 0=white. Other background variables in the regression included social support, measured by the mean score on the Social Support Received scale; education, coded as 1= high school education or greater and 0= less than high school; income, coded as 1=$10,000 or greater and 0= less than $10,000/year; private insurance, coded as 1= having private insurance and 0=not having private insurance.

Tests of multicollinearity were performed in the analyses and revealed that even though some of the variables were inter-correlated, multicollinearity was not diagnosed by the Durbin-Watson coefficient. Ott (1993) maintains that multicollinearity would be considered significant and problematic in data interpretation if the Durbin-Watson values for the regression equation were less than 1.5 or greater than 2.5. The Durbin-Watson equations for the regression run for the middle-age group was 1.9 and for the older group the Durbin-Watson was 1.8.

**3. What are the relationships among personal response variables and diabetes self-management in middle-aged and older adult women with type 2 diabetes?** To answer this question, the same methods were employed as in question # 2 for each step. This section of the model includes the HSDI score, Understanding Diabetes Scale score, self-perception of health score, and Positive Attitudes Score, and the total score of self-rated stress, which were examined in relation to scores on the Self Care Adherence Scale (SCAS). Bivariate relationships of each independent variable and diabetes self-management were examined. Multiple regression was used to regress the scores on the SCAS on the five independent variable scores.

The Durbin-Watson coefficient for the middle age group regression was 1.9 and for the older group was 2.01. Neither score indicated that the model should be altered for the sake of multicollinearity although in the older group more inter-correlation among the predictor variables was apparent.

**4. Are there differences in diabetes self-management for middle-aged and older adult women with type 2 diabetes who have been given health information related to diabetes management, as opposed to those who have not?** To answer this question, the dichotomous variable of diabetes health information was coded as (1= given diabetes education, 0= no diabetes education). The differences between the group means on the Self-Care Adherence scale for those who had had diabetes education and those who had not were analyzed using t-tests for both the middle age group and the older group.

## Delimitations and Limitations

### Delimitations

The sample of the study was limited to middle-aged (ages 50-64) and older adult women (ages 65+) who were non-institutionalized, community-dwelling, with the diagnosis of Type 2 diabetes, and who were deemed responsible for, and able to, practice diabetes self-care management. The participants were also limited to those able to communicate in English who could complete the written surveys, independently, or through personal interviews with the researcher. The sample was also limited to women of the white or black race, as other races were represented by less than 1% in the local population, presuming that inclusion of other races would reduce the applicability of the findings to the population of interest.

### Limitations

The selected sample of clients was not totally representative of all community-dwelling middle-aged and older women who are expected to provide self-management of their diabetes due to the exclusion of those who were cognitively impaired, or who required assistance with their diabetes management. Also, the existence of health problems that may impact the person's future ability to provide self-care is recognized by the author as a potential mediating factor in the study. All information obtained was subjective, through self-report by the participants, considered a limiting factor by some researchers (Creswell, 1994), in that some of the participants may answer to please the researcher.

# Summary

The purpose of this study was to examine diabetes self-management in middle aged and older adult women with type 2 diabetes and to examine differences between the two groups. Women who met the study criteria were recruited from 2 metropolitan cities and one rural area in a southern Appalachian area of the United States. The four questions concerning factors related to disease self management in a sample of (73) middle-aged and (63) older adult women with type 2 diabetes were answered through statistical analyses of data from two instruments: the HSDI, measuring intrinsic motivation and a questionnaire developed from the DCP 2.0, measuring other constructs and demographic data in accordance with the conceptual framework of the Interaction Model of Client Health Behavior. Findings from the study will add to the body of knowledge related to self-management of diabetes in middle-aged and older adult women.

# CHAPTER 4

## FINDINGS

The purpose of the study was to examine factors related to diabetes self-management in middle-aged and older adult women with Type 2 diabetes and to analyze the differences in the influences of those factors on diabetes self-management between the two groups. Cox's Interaction Model of Client Health Behavior (IMCHB) was the theoretical framework that guided the study and the formulation of the four research questions. The data were analyzed using the SPSS 10.0 for Windows® program for personal computers. The analyses included t-tests for differences in independent samples, correlational tests to examine relationships of the variables in the models, and multiple regression analyses of factors related to diabetes self-management. Findings related to each research question are presented in this chapter, as well as the sample description for each age group.

### Sample Characteristics

The total sample consisted of 136 community-dwelling females previously diagnosed with Type 2 diabetes, with ages ranging from 50 to 85 years and residing in a Southeastern region of the United States. The two groups represented middle-age (N = 73) and older adult women (N = 63). All participants were community-dwelling, English speaking women who were responsible for diabetes self-management at home, under the direction of a health care provider. All of the participants completed the surveys in writing and mailed their responses to the researcher.

**Element of Client Singularity**

<u>Background variables</u>

Background variables of the participants were conceptually analyzed, in accordance with the IMCHB framework, by first examining the demographic characteristics of race and age, then the social influences of education and social support and finally the environmental resources of income and insurance. Each age group was examined separately (see Table 2).

<u>Demographic Characteristics</u>

Black women had higher representation in the older group than the middle aged group and greater representation overall than that of adult black women in the southern Appalachian region of the study, which is currently 14.9% (US Census Bureau, 2001). The fact that the researcher recruited from Senior Neighbor centers in an inner-city housing region might have contributed to the increased participation by this group.

The middle-age group had less variance in their ages than the older group, demonstrated by a mean age of 56.1, median of 55 and a mode of 54. The age range for this group was set by the researcher as ages 50-64, thereby imposing a limit. A criterion for inclusion in the older group was age 65 or above, therefore the range of ages for this group was wider, from 65 to 85. The mean age in the older group was

Table 2.  Elements of Client Singularity and Element of Client-Professional Interaction measured by percentages in age groups

| | Middle-age | | Older-age | | Total Sample | |
|---|---|---|---|---|---|---|
| | n (73) | % (53.7) | n (63) | % (46.3) | N (136) | % (100) |
| Demographic Characteristics | | | | | | |
| Race | | | | | | |
| Black | 10 | 13.7 | 14 | 22.2 | 24 | 17.6 |
| White | 63 | 86.3 | 49 | 77.8 | 112 | 82.4 |
| Social Influences | | | | | | |
| Education | | | | | | |
| < HS graduation | 10 | 14.5 | 15 | 26.3 | 25 | 19.8 |
| ≥ HS graduation | 59 | 85.5 | 42 | 73.7 | 126 | 80.2 |
| Environmental Resources | | | | | | |
| Income | | | | | | |
| < $10,000 | 17 | 24.6 | 11 | 19.6 | 28 | 22.4 |
| ≥ $10,000 | 52 | 75.4 | 45 | 80.4 | 97 | 77.6 |
| Insurance* | | | | | | |
| Private | 44 | 60.3 | 32 | 50.8 | 76 | 55.9 |
| Medicare | 12 | 16.7 | 60 | 83.3 | 72 | 52.9 |
| Medicaid** | 23 | 31.5 | 11 | 17.5 | 34 | 25.0 |
| Other | 6 | 08.2 | 21 | 33.3 | 27 | 19.9 |
| None | 4 | 05.5 | 0 | 00.0 | 4 | 02.9 |
| Personal Response Variables | | | | | | |
| Cognitive Appraisal | | | | | | |
| Self-perception of health | | | | | | |
| Favorable | 39 | 53.4 | 39 | 61.9 | 78 | 57.4 |
| Unfavorable | 34 | 46.6 | 24 | 38.1 | 58 | 42.6 |
| Affective Response | | | | | | |
| Stress levels | | | | | | |
| Low (1-3) | 11 | 15.1 | 27 | 42.9 | 38 | 27.9 |
| Moderate (4-6) | 30 | 41.1 | 24 | 38.1 | 54 | 39.7 |
| High (7-10) | 32 | 43.8 | 12 | 19.0 | 44 | 32.4 |
| Client-Professional Interaction | | | | | | |
| Diabetes Education | | | | | | |
| Yes | 48 | 65.8 | 35 | 55.6 | 83 | 61.0 |
| No | 25 | 34.2 | 28 | 44.4 | 53 | 39.0 |

*   Percentage may not equal 100% due to missing data
**  Medicaid includes TennCare of Tennessee

73.4, while the median age was 74 and the mode was 68. An interesting finding was that 17.5% of the older group were age 80 or above.

Social Influences

Highest attained educational levels ranged from grades 7 to 18 years of schooling for the middle-aged group and 8 to 19 years of schooling in the older group. For the purpose of analysis education was recoded into two groups, those with less than a high school education and those with a high school education and beyond (Table 2). Women in the middle-aged group were more likely to have high school or higher level of education.

To measure social support, the questions on the Social Support Scale asked if family or friends helped and supported the woman to (1) follow her meal plan (2) take her medicine, (3) take care of her feet, (4) get enough physical activity, (5) test her sugar and to (6) handle her feelings about her diabetes. Four percent of the middle-aged group and 9.5% of the older age group responded that none of the questions applied to them, indicating a lack of family and friends being available for support. Two of the older age group wrote comments on their surveys to that effect. One woman also wrote the comment "No one cares and has ever looked at my feet" on her survey beside the foot care question.

The older women in the sample were shown to have more social support from family and friends in their diabetes self-management than women in the middle-age group (see Table 3). For the question of "My family and friends help and support me a lot to handle my feelings about diabetes", 17.8% of the middle-aged group

Table 3       Elements of Client Singularity measured by scale scores- social support
              intrinsic motivation, diabetes understanding, positive attitude and diabetes
              self-management                                              N=136

| Element | Middle-age (50-64) (n=73) | | Older-age (65+/=) (n=63) | | Total Sample (N=136) | |
|---|---|---|---|---|---|---|
| | M | SD | M | SD | M | SD |
| Social support | 21.41 | 6.63 | 23.56 | 5.17 | 22.38 | 6.09 |
| Intrinsic motivation | 48.00 | 7.89 | 50.17 | 8.42 | 49.17 | 8.18 |
| Diabetes understanding | 34.67 | 8.97 | 33.17 | 9.04 | 33.98 | 9.00 |
| Positive attitude | 15.23 | 4.11 | 16.76 | 3.60 | 15.94 | 3.94 |
| Diabetes self-management | 12.92 | 2.76 | 14.76 | 2.91 | 13.77 | 2.97 |

disagreed (either somewhat or strongly) and 9.5% of the older age group disagreed (somewhat or strongly) with this statement.

Environmental Resources

Income varied for the entire group from less than $5,000 to $70,000 or greater. Since family status was not determined in this study, poverty guidelines for single persons were used for comparison (U.S.Census Bureau, 2001); therefore $10,000 was used as the determining amount for poverty in the participants. Women in both age groups who reported incomes of $10,000 or greater did not vary greatly (see Table 2), but a wider range of income was found in the middle-aged group. More middle-age women in the sample reported incomes less than $10,000/year and more older women in the sample reported incomes of $10,000 or greater. As a whole, the older women were shown to have more income than the younger women.

For the measure of the environmental resources of insurance, only 8 women in the older group reported having Medicare without other types of insurance. More women in the middle-aged group reported having private insurance, but 12 others (16.4%) in that group also listed Medicare, along with either Medicaid or Tenn Care as well (see Table 2). The women in the middle-aged group would be qualified as disabled or on renal dialysis in order to receive Medicare younger than age 65.

Personal Response Variables

Personal response variables as elements of client singularity in this study that were examined in reference to diabetes self-management of women in the sample

were intrinsic motivation, cognitive appraisal and affective response. Findings for each of the variables were examined by age group for a description of the sample.

Intrinsic Motivation

Scores on the HSDI for middle-aged women ranged from 24-76, while older women in the sample demonstrated scores ranging from 27-68 (see Table 3). The analysis of the overall scores indicated that women in the older group were more intrinsically motivated towards diabetes self-management than women in the middle-age group. One of the statements on the HSDI was "I know what I'm doing when it comes to my health". In the middle-age group 32.9% either agreed or strongly agreed to the statement, whereas 42.9% of women in the older age group agreed or strongly agreed.

Cognitive Appraisal

Study participants were asked to rate their health from excellent (1) to poor (5) as a cognitive appraisal of their health. The five-item response scale ranged from 1= excellent to 5= poor. The results were re-coded so that "excellent", "very good" and "good" were interpreted as "favorable", while the ratings of "fair" and "poor" were interpreted as "unfavorable". Middle-aged women reported more unfavorable health than older women (see Table 2). Only four women in the older age group rated their health as "excellent" (6.3%) and 12 (19.0%) said their health was "very good", whereas no middle-aged participants considered their health to be excellent and only 7 (9.6%) of the women in that group rated their health as "very good".

The other measure of cognitive appraisal was understanding of diabetes management, as depicted by scores on the Diabetes Knowledge Scale. Two of the questions in the scale yielded the lowest rating of understanding (fair to poor) for both groups. Twenty-five middle-aged women (34.5%) and 26 older-age women (41.3%) reported a low understanding of "combining medications", while 23 middle-aged women (31.5%) and 25 older women (39.7%) reported a low understanding of alcohol and diabetes. Women in the middle-age group demonstrated more understanding of diabetes self-management practices than older women. However, less of the older age group had experienced formal diabetes education (see Table 2).

Affective Response

Women in the older age group demonstrated more positive attitudes in the face of Type 2 diabetes than women in the middle-age group (see Table 3). One of the statements that showed close agreement among all women in the study was "Diabetes doesn't affect my life at all". Forty-five of the middle-aged group (61.6%) and thirty-nine of the older women (61.9%) either disagreed or strongly disagreed with that statement.

Affective response to life as a woman with diabetes was also measured by stress rating by the participants. Ratings in both groups ranged from 1-10, with women in the middle-age group reporting a higher mean stress score than the older age group (see Table 3). For descriptive purposes scores of 1-3 are listed as "low", 4-6 are listed as "moderate" and scores of 7-10 are listed as "high" levels of stress

(see Table 2). As a cross reference for determining diabetes type (1 or 2), study participants were asked to state whether they were currently being treated for diabetes by 13 different recommendations for diabetes management (see Table 4). Two of the treatments listed were "stress control" and "behavior modification". An equal number of each group reported that stress control was currently prescribed, while two more women in the older group than the middle-age group reported that behavior modification was prescribed. However, more than 85% of all women in the sample reported that neither intervention was prescribed.

## Element of Client-Professional Interaction

### Health Information

#### Diabetes Education

Diabetes education was measured as an element of client-professional interaction in the study. More women in the older group reported not having received diabetes education than women in the middle-aged group (see Table 2). Differences in diabetes self-management for women who had, and who had not received diabetes education were analyzed in research question 4.

## Element of Health Outcome

### Adherence to Recommended Care

Adherence to recommended care through diabetes self-management was measured as the outcome variable in the study. The older age group of women in the study was shown to be performing diabetes self-management more effectively than

Table 4                          Current prescribed treatment by age groups

| | | Middle age n=73 | | Older age n=63 | | Total Sample N=136 | |
|---|---|---|---|---|---|---|---|
| | | n | % | n | % | N | % |
| Diet | | | | | | | |
| | yes | 65 | 89.0 | 57 | 90.5 | 122 | 89.7 |
| | no | 8 | 11.0 | 6 | 9.5 | 14 | 10.3 |
| Exercise | | | | | | | |
| | yes | 58 | 79.5 | 51 | 81.0 | 109 | 80.1 |
| | no | 15 | 20.5 | 12 | 19.0 | 27 | 19.9 |
| Oral meds | | | | | | | |
| | yes | 56 | 76.7 | 43 | 68.3 | 99 | 72.8 |
| | no | 17 | 23.3 | 20 | 31.7 | 37 | 27.2 |
| Insulin | | | | | | | |
| | yes | 21 | 28.8 | 17 | 27.0 | 38 | 27.9 |
| | no | 52 | 71.2 | 46 | 73.0 | 98 | 72.1 |
| BG self-testing | | | | | | | |
| | yes | 73 | 100.0 | 63 | 100.0 | 136 | 100.0 |
| | no | 0 | 00.0 | 0 | 00.0 | 0 | 00.0 |
| HgbA1c | | | | | | | |
| | yes | 28 | 38.4 | 28 | 44.4 | 56 | 41.2 |
| | no | 45 | 61.6 | 35 | 55.6 | 80 | 58.8 |
| Regular office visits | | | | | | | |
| | yes | 58 | 79.5 | 53 | 84.1 | 111 | 81.6 |
| | no | 15 | 20.5 | 10 | 15.9 | 25 | 18.4 |
| Stress control | | | | | | | |
| | yes | 11 | 15.1 | 11 | 17.5 | 22 | 16.2 |
| | no | 62 | 84.9 | 52 | 82.5 | 114 | 83.8 |
| Behavior modification | | | | | | | |
| | yes | 7 | 9.6 | 9 | 14.3 | 16 | 11.8 |
| | no | 66 | 90.4 | 54 | 85.7 | 120 | 88.2 |
| Urine sugar testing | | | | | | | |
| | yes | 10 | 13.7 | 9 | 14.3 | 19 | 14.0 |
| | no | 63 | 86.3 | 54 | 85.7 | 117 | 86.0 |
| Routine eye exams | | | | | | | |
| | yes | 51 | 69.9 | 46 | 73.0 | 97 | 71.3 |
| | no | 22 | 30.1 | 17 | 27.0 | 39 | 28.7 |
| Regular feet inspection | | | | | | | |
| | yes | 44 | 60.3 | 48 | 76.2 | 92 | 67.6 |
| | no | 29 | 39.7 | 15 | 23.8 | 44 | 32.4 |
| Weight loss | | | | | | | |
| | yes | 37 | 50.7 | 27 | 42.9 | 64 | 47.1 |
| | no | 36 | 49.3 | 36 | 57.1 | 72 | 52.9 |

middle-age women in the study by higher scores on the Self Care Adherence Scale

(see Table 3). Differences in the scores were analyzed in research question 1.

## Research Questions

### Question 1

The first question posed in the research was "Are there differences in diabetes

self-management in middle-aged and older adult women with Type 2 diabetes"?

Scores on the Self Care Adherence Scale were analyzed for differences between the

two groups using the independent samples t-test to answer this question. The analysis

showed that the older age group in the study scored significantly higher on diabetes

self-management than did the middle-age group ($t= 3.370$, $df = 134$, $p=<.001$).

### Question 2

The second question, "What are the relationships among background variables

and diabetes self-management among middle-aged and older adult women with Type

2 diabetes?" was posed within the theoretical framework of the IMCHB. An analysis

of variable correlations and multiple regression was used to examine the relationship

of the predictor variables to diabetes self-management for each group. The analysis

examined whether the demographic characteristics, social influences, and

environmental resources predicted diabetes self-management.

<u>Middle-aged Women</u>

The predictor variables were analyzed for inter-item correlations and

individual relationships with diabetes self-management in each group prior to the

regression analysis (see Table 5). Support from family and friends was the only

Table 5.    Relationships of background variables and diabetes self-management
(DSM) in middle-age and older age group by Pearson correlation

| Middle-age | (n=73) | | | | | | |
|---|---|---|---|---|---|---|---|
| | DSM | Age | Race | Education | Support | Income | Insurance |
| DSM | 1.000 | | | | | | |
| Age | .191 | 1.000 | | | | | |
| Race | -.046 | .002 | 1.000 | | | | |
| Education | -.027 | .034 | -.110 | 1.000 | | | |
| Support | *.209 | .080 | .067 | -.026 | 1.000 | | |
| Income | -.085 | .175 | -.099 | **.382 | -.177 | 1.000 | |
| Insurance | -.106 | .068 | -.084 | **.458 | -.019 | **.474 | 1.000 |

| Older-age | (n=63) | | | | | | |
|---|---|---|---|---|---|---|---|
| | DSM | Age | Race | Education | Support | Income | Insurance |
| DSM | 1.000 | | | | | | |
| Age | .124 | 1.000 | | | | | |
| Race | -.167 | -.049 | 1.000 | | | | |
| Education | .093 | -.061 | -.189 | 1.000 | | | |
| Support | **.409 | .115 | *-.221 | .030 | 1.000 | | |
| Income | -.052 | -.029 | .085 | .149 | .034 | 1.000 | |
| Insurance | .018 | -.106 | -.085 | -.022 | .204 | .010 | 1.000 |

*    p ≤.05   (two-tailed)
**  p. ≤ 001 (two-tailed)

variable in this comparison that showed a significant correlation with diabetes self-management for the middle-aged group. Significant positive inter-correlations were found among insurance, income and education, as often reported in social science and nursing literature. The regression analysis indicated that the background variables in middle-aged women were not predictive of diabetes self-management (see Table 6).

Older-aged Women

The analysis of relationships of the predictor variables with diabetes self-management revealed a significant correlation of social support with diabetes self-management for this group as well, that was stronger than the correlation between the same variables for the middle-age group. Unlike the middle-age group, analysis of correlations among other predictor variables did not reveal any significant relationships among education, income or insurance. Being of white race was shown to be significantly correlated with social support in this age group (see Table 5). The regression analyses for the older age group revealed that their background variables were not predictive of diabetes self-management for women in the older group (see Table 6).

Question 3

The question "What are the relationships among personal response variables and diabetes self-management in middle-aged and older adult women with Type 2 diabetes?" was posed within the IMCHB framework to explore relationships of the personal response variables of intrinsic motivation, cognitive appraisal and affective

Table 6      Predictors of diabetes self-management by background variables in middle-age and older adult women

| Predictor | Middle-age ($\underline{n}$=73) | | Older-age ($\underline{n}$=63) | |
|---|---|---|---|---|
| | B | S.E. | B | S.E. |
| Age | .19 | .079 | .07 | .063 |
| Race | -.07 | .964 | -.06 | .931 |
| Education | .04 | .963 | .08 | .807 |
| Social support | .19 | .051 | *.40 | .075 |
| Income | -.05 | .874 | -.07 | .829 |
| Insurance | -.11 | .812 | -.06 | .758 |
| F = | 1.096 | | 1.991 | |
| $R^2$ = | .01 | | .10 | |

*$p < .05$

response to diabetes self-management in middle-aged and older adult women in the sample.

Middle-age Women

As with question 2, the predictor variables were first analyzed for individual correlations with diabetes self-management in each group. Significant positive relationships were found between diabetes self-management and positive attitude and between diabetes self-management and diabetes understanding (see Table 7). The women with more positive attitudes towards diabetes and a higher level of understanding of diabetes were higher in diabetes self-management. However, a significant negative relationship was shown between diabetes self-management and stress in this group; those with less stress had better diabetes self-management. A multiple regression analysis was performed to examine the relationship of the predictor variables of personal response and diabetes self-management in middle-age women. Personal response variables significantly predicted diabetes self-management in this group and explained 11.9% of the variance (see Table 8).

Older age Women

The correlation analysis of the model revealed that all of the personal response variables were significantly related to diabetes self-management in the older age group (see Table 7). The direction of the relationships indicated that diabetes self-management was higher for the older women who were more intrinsically motivated, had higher self-perceptions of their health, more understanding of diabetes, a more positive attitude and with less stress.

Table 7    <u>Relationships of personal response variables and diabetes self-management (DSM) in middle-age and older age group by Pearson correlation</u>

<u>Middle-age</u>    <u>(n=73)</u>

|  | DSM | Intrinsic motivation | Self perception | Diabetes Understanding | Positive Attitude | Stress level |
|---|---|---|---|---|---|---|
| DSM | 1.000 | | | | | |
| Intrinsic motivation | .089 | 1.000 | | | | |
| Self-perception | -.183 | *.266 | 1.000 | | | |
| Diabetes understanding | *.256 | **.343 | .133 | 1.000 | | |
| Positive attitude | **.370 | *.215 | **.578 | *.265 | 1.000 | |
| Stress level | *-.249 | .107 | *-.249 | -.031 | **-.394 | 1.000 |

<u>Older-age</u>    <u>(n=63)</u>

|  | DSM | Intrinsic motivation | Self perception | Diabetes Understanding | Positive Attitude | Stress level |
|---|---|---|---|---|---|---|
| DSM | 1.000 | | | | | |
| Intrinsic motivation | **.552 | 1.000 | | | | |
| Self-perception | **.535 | **.462 | 1.000 | | | |
| Diabetes understanding | **.596 | **.396 | *.252 | 1.000 | | |
| Positive attitude | **.485 | **.487 | **.552 | *.310 | 1.000 | |
| Stress level | *-.257 | *-.266 | *-.395 | -.142 | **-.485 | 1.000 |

\*    $p \leq .05$    (two-tailed)
\*\*   $p. \leq 001$  (two-tailed)

Table 8    Predictors of diabetes self-management by
personal response variables in middle-age and older adult women

| Predictor | Middle-age (n=73) | | Older-age (n=63) | |
|---|---|---|---|---|
| | B | S.E. | B | S.E. |
| Intrinsic motivation | -.01 | .043 | .21 | .038 |
| Cognitive appraisal: self-perception of health | -.04 | .762 | *.28 | .660 |
| Cognitive appraisal: diabetes understanding | .18 | .037 | *.41 | .031 |
| Affective response: positive attitude | .29 | .099 | .11 | .096 |
| Affective response: stress level | -.14 | .154 | .02 | .128 |
| F = | 2.963 | | 14.50 | |
| $R^2$ = | .12 | | .49 | |

*p <.05

A multiple regression analysis was performed to examine the relationship of the predictor variables of personal response and diabetes self-management in the older age group. Personal response variables were shown to be significantly predictive of diabetes self-management in this age group and explained 49.4% of the variance (see Table 8). Specifically, better self-perception of health, higher level of intrinsic motivation, a more positive attitude towards diabetes self management, better understanding of diabetes and less stress were predictive of better diabetes self-management in this group.

### Question 4

This question was posed to examine the client-professional interaction of diabetes education in relation to the outcome variable of diabetes self-management. The research question was "Are there any difference in diabetes self-management for middle-aged and older adult women with Type 2 diabetes who have been given health information related to diabetes self-management as opposed to those who have not?" To answer this question, the differences in diabetes self-management between those who had received diabetes education and those who had not were analyzed by independent samples t-tests in each group. In the middle-age women group, those who previously had diabetes education scored slightly higher on diabetes self-management than those who had not had diabetes education, but the finding did not reach statistical significance. However, in the older group, the women who had had formal diabetes education scored significantly higher on diabetes self-management

than those who did not have the education (see Table 9). Interestingly, fewer of the women in the older group had experienced formal diabetes education.

## Summary of Findings

The sample of 136 community-dwelling women with Type 2 diabetes who participated in this study were similar demographically to other women of the same age ranges in the Appalachian region of the United States (U.S. Census Bureau, 2001). The age groups differed on background variables of race, education, income and insurance. More black women were included in the older group. The older group was more diverse in their ages than the middle-age group. Fewer women in the older group had completed high school, but almost half of the middle-age group and over one fourth of the older group had college education of varying levels. The older group in the sample had higher incomes and less numbers on Medicaid than the other group. More of the middle-age group had private insurance, but women in the older group had both Medicare and private insurance in high numbers. Social support, represented by help from family and friends in diabetes self-management, was higher for women in the older group.

On the personal response variables women in the older group were shown to be more intrinsically motivated than the middle-age group. Self-perception of health for the older women was more favorable than for the middle-age group but diabetes understanding was lower for the older women. The older women in the sample were found to have more positive attitudes in the face of diabetes, and reported lower levels of stress in their lives at the time. Conversely, the middle age group reported

Table 9    Analysis of differences by t-tests in diabetes self-management of women
          with and without diabetes education by age group

| | Middle-age (n=73) | | Older age (n=63) | |
|---|---|---|---|---|
| | M | SD | M | SD |
| With diabetes education | 13.00 | 2.99 | 15.71 | 2.54 |
| Without diabetes education | 12.76 | 2.88 | 13.57 | 2.95 |
| t = (df) | .3510 (71) | | 3.098 (61) | |
| * p ≤ .05 (two-tailed) | .727 | | .003 | |

high stress more often than either moderate or low levels, rated their health more unfavorably but their understanding of diabetes higher than those in the older group. More than 85% of the women in both groups had not been prescribed stress management as a treatment strategy. More of the older women did not receive diabetes education than the middle-age group. Overall, thirty-nine percent of the total sample had not received diabetes education.

There was a significant difference in diabetes self-management between middle-age and older adult women. Multiple regression analyses found that background variables were not predictive of diabetes self-management for either age group. However, personal response variables were found to be predictive of diabetes self-management for both middle-age and older women.

The independent samples t-test revealed that in the middle-age group diabetes self-management did not differ for those who had received diabetes education and those who had not. However, in the older age group those who had received diabetes education showed a higher level of diabetes self-management than those who had not received education.

# CHAPTER 5

## DISCUSSION, CONCLUSIONS AND IMPLICATIONS

This study was undertaken to explore the relationships of specific elements of

client singularity to diabetes self-management in middle-age and older adult women

in southern Appalachian women with Type 2 diabetes and to also examine differences

in diabetes self-management between the two groups. Additionally, diabetes

education was examined as an influential factor in diabetes self-management for both

groups.

### Discussion of the Conceptual Framework and Study Outcomes

The study was unique in that it was also a test of a nursing conceptual

framework, the IMCHB, in two specific age groups, comparing their health outcomes

as a way of exploring the differences in the groups through a nursing framework that

was designed to "identify and suggest explanatory relationships between client

singularity, the client-provider relationship, and subsequent client health behaviors"

(Cox, 1982, p.46).

The first question in the study was posed to investigate whether women in the

two age groups differed in diabetes self-management. Results of the analyses revealed

significant differences in diabetes self-management between the groups, with women

in the older group displaying higher levels of diabetes self-management than the

middle-aged women. Previous studies were not found in the literature that examined

differences in diabetes self-management in these two groups, nor use of the IMCHB

for the population represented. Other studies have shown a variety of changes that

occur with the aging process that potentially impact glucose control (Robinson et al.,

1996; Ruggiero et al., 1997; Sattar, Perera, Small & Lumsden, 1999; Toth, Sikes,

Eltabbakh & Poehlmann, 2000; Walton, Godsland, Proudler, Wynn & Stevenson,

1993). Not only physiological differences occur in women at different stages of their

lives, but psychosocial changes occur as well, especially in relation to family

structures and support systems (Ebersole & Hess, 1998). Since many changes in

family systems and roles of women in society have taken place over the past 20-30

years, it logical to conclude that the older women in this study may have lived

differently when they were in middle age than the women in the younger group do

today. Whether the middle-age women in this study will become more able to self-

manage diabetes in their later years as demonstrated by the older women is not

known. Therefore, more information is needed in order to understand factors

impacting the differences in diabetes self-management in the two groups, especially

in view of the need to improve outcomes for middle-age women.

In this study it was found that when examined as a whole, background

variables did not predict diabetes self-management in either middle-age or older

women. The researcher in this study chose to examine background variables in

relation to diabetes self-management in order to explore relationships of those factors

in view of previous studies in older women related to diabetes self-management, but

lack of such studies in middle-age women. In addition, some of the background

variables such as social influence, education, income and insurance are considered by

this researcher being mutable factors that could be addressed through nursing

interventions, unlike those of race and gender, or age. It was also acknowledged by the researcher that input by the study participants would represent their situation at a given point in time, making that information very useful for future directions in nursing interventions. The finding that the background variables, as a group, were not significantly influential on diabetes self-management for either group of women was in itself important to discover. Neither race, nor age within the groups, education, income, or insurance were shown to be predictive of diabetes self-management in either group. Studies of black women with Type 2 diabetes have focused on cultural needs in relation to health outcomes, which have been shown to be important (Agur-Collins, et.al, 1997; Newell-Withrow, 2000; Rajaram & Vinson, 1998; Samuel-Hodge, et.al. 2000), but the specific relationship of race to diabetes self-management in middle-aged and older women with Type 2 diabetes has not been reported in the literature. Even though the percentage of black women in this study was comparable to the percentage in the population, the small numbers of black women in each group do not allow generalizations to be made about the impact of race on diabetes self-management in the population studied. A study that focuses on the differences in diabetes self-management by race for each of the age groups would yield more information needed in the planning of nursing interventions, especially in community settings; however, social support was shown to be the most influential of any of the background variables in the analysis of the second research question.

Social support was found to be higher for women in the older group than the middle age group. This study supported previous findings that social support has been

a significant predictor of diabetes outcomes (Agurs-Collins et al, 1997; Liburd, Anderson, Edgar & Jack, 1999; Samuel-Hodge et al, 2000). Social support was the only element in the background variables that was significantly related to diabetes self-management when relationships among the variables were examined. In both middle-aged and older women more support from friends and family was positively correlated with higher diabetes self-management. The positive influence of social support on health outcomes has been previously discussed, and was not surprising, but was especially pertinent for the middle age women in view of other findings in the study.

Studies in the literature have shown the relationship between social support and diabetes outcomes for older women but were not found for middle-age women to compare with results of this study. Connell's study (1997) of older adults with Type 2 diabetes found that less than one-third of the participants reported wanting help with their diabetes self-management from family and friends. However, other researchers found social support to be an important factor in health outcomes for older adults and minority women (Agurs-Collins, 1997; Anderson et al., 1997; Hatch, 1991; and Landis, 1996). Assuming that the impact of social support on diabetes outcomes would be similar for middle-aged women as that for older women, the next step would be to examine the meaning of social support for women in both groups and to then explore ways to provide the support while testing the outcomes of such an intervention.

Findings from the third research question that explored the relationship of the personal response variables to diabetes self-management revealed differences in the two groups. In the middle-age group understanding of diabetes management, a positive attitude towards diabetes and lower stress were significantly related to better diabetes self-management. Whereas in the older group, in addition to the same variables mentioned for the middle-age group, having a more intrinsic motivation for health and a more favorable self-perception of health were also significantly related to better diabetes self-management. Women in the middle-age group were noted to demonstrate lower intrinsic motivation and more unfavorable self-perception of health than the older group. These findings might partially be explained by the fact that 12 (less than 14%) of the women in that group were on Medicare, which would presumably be linked to lower health status from disability. At the same time, it is not known how many of the older women in the study might have been on disability as well, which could potentially impact their personal responses to diabetes self-management. More information is needed in relation to morbidity and health status in each group in order to better understand the impact of those factors on intrinsic motivation and self-perception of health of women in both groups.

Previous studies have identified significant relationships between intrinsic motivation and health as well as self-perception of health and health outcomes (Carter & Kulbok, 1995; Benyami, Leventhal & Leventhal, 1999; Ider & Angle, 1990; Ider & Kasl, 1990; Roos & Havens, 1991). Findings in this study indicate a higher risk for the middle age women due to their poor self-perception of health. The relationship of

intrinsic motivation and diabetes self-management in middle-aged women, as well as older women, has not been previously reported for comparison with this study's findings.

Women with diabetes have been previously reported to express higher stress and lower self-perception of health than women without diabetes (Philipp, 1994), but in this study differences between two age groups of women who both had diabetes were demonstrated. Previous studies of middle-age women have identified significant relationships between life stage development and stress, especially for women facing demands of care giving for others (Thomas, 1997b). In particular, women at mid-life have been shown to be susceptible to stress brought on by worrying about others' problems (termed vicarious stress) as well as personal problems (Thomas, 1997a). In this study 84.9% of women in the middle-age group reported moderate to high stress levels, compared with 57.1% of women in the older age group. For women with Type 2 diabetes, unrelieved stress can result in high glucose levels from the physiological response of the endocrine system, in spite of self-management efforts on the part of the client to adhere to a prescribed regimen of exercise, diet and medications.

These study findings point to the need for more information regarding personal responses of middle-age women to the health threat of Type 2 diabetes. None of the studies found in the literature examined such factors in middle-age women with Type2 diabetes; therefore no comparisons can be made of the outcomes. Additional investigation is needed to further explore each of the personal response variables in relation to diabetes self-management in both groups of women. It would

be useful to better understand what facilitated the positive outcomes for the older

women as well as what facilitated the more negative outcomes for the middle-age

women.

The final research question was posed to examine the client-health

professional interaction of diabetes education in relation to diabetes self-management

in each group of women. The finding that diabetes education was shown to make a

significant difference in diabetes self-management in older women, but was not

related to diabetes self-management in the middle-aged women in the study was

interesting, and somewhat disturbing. At the same time, a greater number of women

in the older age group than women in the middle age group had not had diabetes

education. Implications of this finding are that even though more women in the

middle-age group had diabetes education, diabetes self-management did not differ in

relation to that experience. Previous studies have indicated that diabetes education

was found to be significantly related to positive diabetes outcomes (Sadur et al.,

1999; Yung, et al., 1998). However, findings from one study indicated that the

method of diabetes education delivery (culturally appropriate) was a factor in the

relationship of diabetes education to perception of diabetes and adherence to

prescribed regimens (Ruggerio, et al., 1997). In this study types of treatment were not

evaluated in relation to the outcome variable.

In analyzing the treatment of diabetes that participants were currently

prescribed, it was surprising to note that women in both age groups reported a high

number of interventions prescribed for diabetes management, including use of oral

medications, insulin and blood glucose testing (100% of the sample). However, over

30% of the women in the sample had not had diabetes education. Diabetes education

is provided at major medical centers and hospitals throughout the region of the study,

but is costly. Classes are charged by the hour or by group sessions and require a

prescription from a qualified health care provider for reimbursement by third-party

payers. Unfortunately, those women with Type 2 diabetes but without adequate

insurance coverage are at a disadvantage in the southern Appalachian region of this

study, as few opportunities exist for them to obtain the medications, treatments,

supplies and diabetes education needed for appropriate self-management of their

disease. Even though some federally sponsored diabetes educational programs for

minority groups have been funded for states in the southern Appalachian region, the

scope of the programs is limited due to financial constraints (Wallace, 2001).

Therefore, women who may not be able to self-manage their diabetes due to lack of

information or adequate resources are at high risk. Studies have not been reported that

compared health outcomes of women with and without the needed resources for

diabetes self-management. Such studies are needed, especially in view of the

additional numbers of middle-age women who are suffering from Type 2 diabetes

who will become the older women with the disease in a few short years.

The findings in this study in relation to the last research question point to the

need for further investigation into many issues related to diabetes education in the

community. Methods of information delivery, accessibility, appropriateness of

content and client health outcomes in relation to the education should be explored.

<u>Measurement Tools</u>

<u>HSDI</u>

The instrument used to measure intrinsic motivation has been used in studies of elders, and samples that included women in the middle age category; however, the tool has not been previously used in a sample of women in the middle-age category. This study added to the body of knowledge related to the conceptual framework (IMCHB) as well as the reliability of the HSDI in the two age groups of women represented.

<u>DCP 2.0</u>

The scales of the DCP 2.0 used in this study have previously been shown to be reliable in measuring psychosocial factors in patients with diabetes. Samples in previous studies have included adults of various age groups, with some studies focusing on elders. However, no studies to date have used the DCP 2.0 in an examination of middle-age women. Reliability coefficients of the scales used in this study were shown to be comparable to other studies. Additional examination of psychosocial factors using the DCP 2.0 in a larger sample of middle-age women with diabetes is warranted.

**Conclusions**

Conclusions drawn from the analysis of factors related to diabetes self-management in this study studied are relevant for nursing practice, research and education. First, it was found that women in the middle-age group did not practice diabetes self-management as well as women in the older group. That finding warrants

further exploration, not only to more closely examine what is happening to women in middle age that affects their poor outcomes, but also to examine how the older women are achieving better outcomes.

Secondly, background variables such as race, income, education and insurance were not found to be related to factors in diabetes self-management in this study. This finding is important to consider in view of the fact that grant funding is often based on such demographic criteria. However, women who are disadvantaged due to income, qualify for medical care that those women who are above poverty, but without insurance do not. Those who have government insurance, such as Medicaid, do have access to medications, as well as primary care providers and diabetes education classes. The persons not included in community care are those women who may be among the working poor who do not have adequate insurance to access care, yet have the need for medications, glucose testing supplies and the necessary education in order to manage their disease. However, additional demographic information, such as work status, marital status, and other factors that could impact health outcomes of women with Type 2 diabetes is needed in order to better interpret the findings from this particular research question.

In this study it was shown that personal response variables were significantly predictive of diabetes self-management in both groups of women, with middle-age women seeming to be more at risk due to lower intrinsic motivation, lower self-perception of health, poorer attitudes and higher levels of stress. Studies were not available for comparison for this age group. The findings of higher intrinsic

motivation, self-perception of health, more positive attitude and lower levels of stress in the older women were similar to other studies, and yet were more significant in that these findings were in relation to a younger group of women with the same chronic disease, living in the same community. All women with Type 2 diabetes are at significant risk for debilitating complications when the disease is not controlled on a daily basis. These findings indicate that the middle-age women in the study are more at risk than the older women due to the poorer self-management of their disease.

The fact that diabetes education did not relate to a higher level of diabetes self-management in middle-age women, but did in older women, who had less diabetes education than the middle-age women was also a finding that, as previously discussed, warrants a more comprehensive investigation. More information is needed to better understand the nature of education received by women with diabetes and the meaning of that education to them in relation to their needs for self-management of the disease. Further investigation should also include a comprehensive analysis of current practices in diabetes education in the southern Appalachian area of concern.

## Implications and Recommendations

### Nursing practice

Implications of this study's findings for nursing practice are for a more holistic approach towards women with Type 2 diabetes so that factors impacting self-management are adequately addressed in routine care. This researcher recommends that nursing assessments include an evaluation of stress level, availability of social support and diabetes self-management practices in addition to adherence to the

recommended standards of practice for diabetes care (American Diabetes Association, 2001). It is further recommended that those nurses in the position to diagnose and treat women with diabetes include referrals to professional counselors, diabetes support groups and community resources as needed for those women found to be at risk. A recommendation for nurses in practice who work with women who suffer from Type 2 diabetes and who are faced with the challenge of self-managing their disease is that those nurses be non-judgmental in their care and to avoid the use of the term "non-compliant". Findings from this study indicate that a variety of factors may be involved in a woman's ability to self-manage diabetes. Finally, practicing nurses should be aware of the national standards for diabetes management and education, as well as community resources available for client referrals and current research on diabetes self-management.

<div align="center">Teaching</div>

Implications and recommendations for teaching in nursing include a different approach to diabetes education at several levels, and for different populations. The first recommendation for education at the university level is that classes for professional nurses should include psycho/social factors in diabetes management as well as life development differences, and be linked to mental health concepts. Innovative patient teaching techniques, based on nursing theories that consider human responses, should be introduced in both community health classes as well as other appropriate classes that include a focus on client empowerment, with the avoidance of labeling clients "non-compliant". Universities should also offer continuing education

sessions for nurses who work with women with diabetes by addressing the need for exploring different approaches in their client teaching and client interactions. Teaching those classes through use of a nursing conceptual framework or theory would also facilitate the linking of concepts of holistic care and the impact of nursing interactions. Teaching at the community level, such as in industrial health, at community centers, corporations and for nurses in private businesses of client education should include an emphasis on psychosocial factors in diabetes management, including stress management and behavioral adjustment to diabetes. All teaching programs for community clients should include an innovative approach to teaching so that sessions might be structured for specific interest groups, based on their specific needs, such as middle-aged working women, or older, retired women.

### Research

Implications of this study's findings for nursing research are many. Specific recommendations are for further studies to address the findings. For additional information in an area that was found to have no other studies for comparison, the study could be repeated, using a larger sample, with broader representation in each of the groups. In a repeat study more demographic information should be included, such as employment information and perceived limitations to diabetes management. The Diabetes Care Profile includes other scales related to attitude measurement and support measurement that might yield more information. An innovative approach to recruiting a large sample in tune with technology of the day would be to explore the use of Internet and email, accessing nurses through out the country.

More information is needed related to diabetes self-management by women in different stages of life. A non-experimental study that examines a broader scope of factors, including socio-demographics and client-nurse interactions in a larger sample of both age groups is warranted.

More information is needed regarding the meaning of social support in respect to diabetes self-management in middle-age and older women. Designing intervention programs that address social support issues is not appropriate at this point when little is known about what types of social support is needed and from whom. At the same time, a study to explore the issue of intrinsic motivation in middle -age women and self-perception of health of those women with Type 2 diabetes is needed as well.

Exploration of the sources of stress and preferred methods of stress relief for middle-age women with Type 2 diabetes through an approach that would yield more in-depth information, such as a phenomenological study is warranted. In addition, further exploration into the meaning of diabetes self-management through a qualitative study should be conducted for each age group. Personal responses to the chronic illness of Type 2 diabetes needs further investigation in both middle-age and older women. Finally, an intervention designed to test an innovative method of approaching diabetes self-management through a controlled-trial study with both age groups should be examined.

## Summary

Factors related to diabetes self-management in middle-age and older adult women with Type 2 diabetes yielded interesting findings, as well as a number of

issues to be explored in future studies. The IMCHB was the conceptual framework of the study, which guided the research questions and the investigative approach. The IMCHB was designed to examine not only the interaction of elements of clients' unique elements of singularity but also the interaction of those elements with health providers in relation to health outcomes of clients. The model has been described as prescriptive in that it is designed to help in the analysis of factors that impact client outcomes. The model no only was useful in guiding the study, but also the analysis of the interactions of the elements of client singularity and the element of client-health professional interaction of diabetes education in relation to diabetes self-management yielded information that warrants further investigation. Therefore, the findings of the study, guided by the conceptual framework, were found to have implications for nursing practice, education and research.

The overall finding of this study was that the older women were more successful at diabetes self-management than the middle-age women, as well as being more positive in attitude, having more intrinsic motivation for health, a higher self-perception of health and less stress, even in the face of less formal education and less diabetes education. One of the Healthy People 2010 objectives related to diabetes outcomes is to "increase the proportion of persons with diabetes who receive formal diabetes education" (U.S. Department of Health & Human Services [DHHS], 2000; DHHS, 2001). However, the results of this study indicate that even though diabetes education related to better self-management in the older women, it did not in the middle-aged women, who were demonstrated to be at high risk from poorer self-

management practices. It is therefore evident that more factors are related to diabetes self-management than just diabetes education. The other <u>Healthy People 2010</u> objectives related to diabetes outcomes are primarily focused on the reduction of complications as a result of the disease not being controlled. This study points to the need for nurses in all areas of practice, education and research to be aware of the need to look beyond the client's inability to manage this complex disease and to search further for answers that will help clients to become successful.

It has been predicted that by the year 2030 over 40 million women will be age 65 or above. Also, even though 60% of all cases of diabetes in this country are suffered by women today, as women grow older the number with diabetes will increase exponentially (Stenson, 2001), which is predicted to be a major health issue in this country in coming years. Halter (2001) reported that barriers to good diabetes control are often related to attitudes and practices of health practitioners, rather than clients' abilities. Therefore, health practitioners, especially nurses, who work with diabetes clients need to be aware of current trends in diabetes management as well as understand factors impacting their clients' abilities to self-manage such a life-threatening disease.

The findings from this study are limited by the small sample size, the number of factors examined, and even perhaps the geographical location. However, the implications for additional research, better nursing practices and a more comprehensive approach towards education in respect to diabetes self-management in both middle-age and older adult women cannot be ignored.

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APPENDICES

APPENDIX A

IRB Approval Letter

THE UNIVERSITY OF TENNESSEE

## MEMORANDUM

College of Nursing
1200 Volunteer Boulevard
Knoxville, Tennessee 37996-4180
(865) 974-4151
FAX (865) 974-3569

TO:     ✓ Gerry Ann Molavi
        Debra Wallace

FROM:   Maureen Groer

DATE:   November 30, 2000

RE:     Form A (An Analysis of Factors Related to Diabetes Self-Management in Middle-Aged and Older Adult Women)

Your Form A has been reviewed and approved by the College of Nursing, Committee on Research Involving Human Subjects.

Best of luck in your endeavors.

MG:jb
Attachments

Groer/forma.memJawson

APPENDIX B

Letters of Permission to Use Instruments

# OFFICE OF EDUCATIONAL RESOURCES & RESEARCH—OER²

*DEPARTMENT OF MEDICAL EDUCATION*
*THE UNIVERSITY OF MICHIGAN MEDICAL SCHOOL*

November 8, 2000

Gerry Molavi
4113 Eastway Terrace
Chattanooga, TN 37412

Dear Gerry,

Attached, is a copy of the Diabetes Care Profile (DCP). You have our permission to reproduce and use the instrument subject to the proviso that the Michigan Diabetes Research and Training Center be credited for their development in any publication of research results.

The DCP is designed to diagnose the educational and psychosocial needs of individuals with diabetes. The earlier version of the instrument, referred to as the Diabetes Educational Profile, has been empirically validated. This work was reported in the Spring 1986 issue of The Diabetes Educator. Substantial modifications and improvements, based on experience with the DEP, have resulted in the DCP which is described in the January, 1987 Health Psychology article.

We hope that this information will be helpful. If you have any questions, please feel free to contact me at (734) 763-1153.

Sincerely,

James Thomas Fitzgerald, Ph.D.
Assistant Research Scientist
Office of Educational Resources
and Research

JTF/cm
Attachments

**University of Massachusetts**
**UMASS** Lowell

## COLLEGE OF HEALTH PROFESSIONS

November 28, 2000

Gerry Ann Molavi, MSN, RN, CS, FNP
4113 Eastway Terrace
Chattanooga, Tennessee 37412

Dear Ms. Molavi:

You certainly have my permission to use the HSDI in your study "A Comparative Analysis of Factors Related to Diabetes Self-Management in Middle-Aged Older Adult Women". As in our previous discussions, please be advised that the alphas for the total scale as well as the subscales may be decreased owing to the homogeneity of the sample on gender, age, and chronic illness. This homogeneity has been reported previously in the literature.

I would ask that you share a summary of your study's findings as well as any psychometric performance data on the HSDI. Wishing you every success as you complete your doctoral studies.

Sincerely,

Cheryl L. Cox, PhD, RN
Professor and Director PhD Program

APPENDIX C

Sample Letters to Agencies for Permission to Access Clients

December 28, 2000

Becky Hall
Christ United Methodist Church
8645 East Brainerd Road
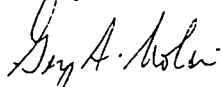Chattanooga, Tennessee 37421

Dear Mrs. Hall,

I spoke with you today regarding my dissertation study on diabetes in women. I am delivering a packet of information to you that will explain the study further. Enclosed is a copy of the letter to the participants, the survey tool and the pamphlet that I have written as a gift to the participants. In addition, each pamphlet will have a gold dollar attached for the participant to keep for donating their time for the completion of the surveys. A self-addressed, stamped envelope will also be included for the participants' convenience. For your information I am also including a copy of the study proposal that I submitted to the university IRB for approval.

Prior to beginning data collection in this study I have obtained full approval from the Institutional Review Board (IRB) of the University of Tennessee/ Knoxville, where I am a PhD student in the College of Nursing. My advisor for my dissertation work is Dr. Debra Wallace at UTK. Her contact information is included on the participant letter. In order to complete my file for data collection I will need to show evidence of having obtained permission to distribute the information about my study at each agency. I will leave the information with you today, which can be distributed as soon as convenient, but I would appreciate it if you could write a letter of approval for me to include in my files.

Thank you for agreeing to distribute the information at the church. I have included some flyers that can be distributed to the various women's groups, as well as the "invitations to participate" that I thought could be distributed from the church office, if that is convenient. Your help in this matter is greatly appreciated.

Sincerely,

Gerry Ann Molavi, MSN, RN, CS, FNP
PhD candidate
University of Tennessee

4113 Eastway Terrace               Home phone: 867-5166  Fax: 867-1963
Chattanooga, Tennessee, 37412      Email: gmolavi@mindspring.com
                                   Research study: 867-2954 or 1-888-841-9348

December 15, 2000

Dr. Christine Parker
Chairperson, Investigational Review Board
Memorial Health Care System
2525 DeSales Avenue
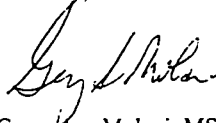Chattanooga, Tennessee, 37404

Dear Dr. Parker,

I contacted you a few days ago in reference to my PhD dissertation research involving women with Type 2 diabetes. I waited to follow up as I was in the process of obtaining approval for the study from the Institutional Review Board at the University of Tennessee/Knoxville, where I am a doctoral student in the nursing program. Now that final approval has been obtained from UTK's IRB, I would like to proceed with data collection as soon as possible. My study consists of two surveys to be administered via mail, telephone or personal interview to women ages 50 and above with Type 2 diabetes.

I have included a copy of my IRB proposal for further explanation of the study. I would like to be able to provide flyers, and/or "invitations" to participate to the appropriate department at your agency to be made available to employees in an effort to recruit the necessary sample I need to complete the study. I would like to be able to access the Golden Circle, as well as the Joslin Diabetes Center and the Northshore Clinic in particular. I am seeking at least 64 participants in the middle-age category (50-64) and 64 participants ages 65 and above. I would also hope that hospital and clinic employees might be willing to help by giving notification to relatives or acquaintances eligible to participate in this research.

I realize that health promotion is a primary concern of everyone at the Memorial Health Care System; therefore, I felt that you might be willing to assist me in this endeavor. I hope that my research will serve as a baseline of information in the area of diabetes self-management that will be beneficial to health care providers in the future.

If your Research Review Board agrees to the distribution of flyers and/or invitations (and some of the participant packets) at your hospital and community facilities, I will be able to supply the information as soon as I receive written notification. The participants will be thanked for their participation by the gift of an "Information Pamphlet" on diabetes management, as well as a silver or gold dollar that will be included in their study packets. I look forward to hearing from you. Thank you.

Sincerely,

Gerry Ann Molavi, MSN, RN, CS, FNP
PhD Candidate, University of Tennessee/Knoxville

4113 Eastway Terrace            Home phone: 867-5166  Fax: 867-1063
Chattanooga, Tennessee, 37412   Email: gmolavi@mindspring.com
                                Research study: 867-2954 or 1-888-841-9348

attachments

APPENDIX D

Sample Letters of Permission from Agencies

# Christ United Methodist Church

*"Striving to Serve Christ and the Community in the East Brainerd Area"*
8645 EAST BRAINERD ROAD
CHATTANOOGA, TENNESSEE 37421

G. Dennis Newman, *Senior Minister*
R. Paul Smith, *Minister of Evangelism*
Lawrence C. Clark, *Minister of Pastoral Care*
James L. Philpott, *Minister of Counseling*

CHURCH PHONES: 892-9363
892-8442
892-8443
FAX NO 892-8443

December 29, 2000

Gerry Ann Molavi
4113 Eastway Terrace
Chattanooga, TN 37412

Dear Ms. Molavi,

This letter is to confirm that we met and talked about your project. We are willing for you to leave your information for the congregation. We will post the flyers and put a notice in our newsletter for those who might be interested in participating and qualify.

I wish you the best in your survey and the work that you are doing as a candidate for your doctorate.

Sincerely,

Becky Hall
Dir. Of Ministries

# Memorial
# Health Care System

MEMORIAL HOSPITAL

January 9, 2001

Gerry Ann Molavi, RN, MSN, CS, FNP
4113 Eastway Terrace
Chattanooga, TN 37412

Dear Ms. Molavi:

RE:     Diabetes Self-Management Study

This letter is to inform you that according to 45CFR46 101(b)(4) this study is exempt from HHS
guidelines. Therefore, I have reviewed and approved the questionnaire and recruitment materials that
were submitted on the above mentioned study. The questionnaire does not contain identifiable
information and an informed consent form is not required.

If you have any questions, please let me know.

Sincerely,

*CW Parker M.D.*

Christine Parker, MD, Chairperson
Investigational Review Board

/mml

APPENDIX E

Participant Information Letter

Participant Information for Research Project

**" An Analysis of Factors Related to Diabetes Self-Management in Middle-Aged and Older Adult Women"**

You are invited to participate in a research study conducted by Gerry Ann Molavi, a nursing doctoral student at the University of Tennessee/ Knoxville. The purpose of this study is to gain an understanding of how factors in women's lives relate to how they manage their diabetes. You are eligible to participate in this study if you are at least 50 years old, female, have been diagnosed with diabetes after age 35 (Type 2 diabetes), and are expected to take care of your diabetes at home, under the direction of your physician or nurse practitioner. The study consists of two surveys that can be mailed to you, or completed by telephone or by interview with the researcher. If the surveys are sent by mail, a self-addressed and stamped envelope will be included for their return.

There is a slight risk that you may become upset by answering the survey, especially if you are having a difficult time managing your diabetes. If needed, you will be referred to a diabetes management class or health care professional. After receiving the survey by mail, you can choose to not participate if you wish. If you choose to be surveyed by telephone, or in person, you can decide to stop the interview at any time. Whether you participate in the survey or not will not affect the health care you receive from your physician or nurse practitioner. No one other than the researcher will know of your participation in the survey. Your completion of the surveys will be considered your consent to participate in this study.

There is no guarantee that you will directly benefit from participation in this study. although the information gained from this research will provide a better understanding of factors in women's lives that affect their ability to care for their diabetes at home. It is possible that the researcher will recommend changes in diabetes management education for women in your age category based on the study's findings.

All records in this study will be kept strictly confidential. If you are sent a survey packet by mail, only the researcher will have access to your address. This information will be kept in a locked file by the researcher and destroyed after the data collection period ends. For those of you who choose to be interviewed by telephone, you will be called from a private telephone that does not have a caller identification system. No names, addresses, or other identifying information will be recorded in the study, or in any reports generated during or after the study. There will be no way for anyone to know what your answers were on the survey. Please keep the pamphlet and dollar, even if you do not complete the surveys.

If you have questions about the survey, or about your rights as a participant, you may contact the researcher or faculty advisor at any time at the following:

| Researcher: | Gerry Ann Molavi, RN, MSN, CS, FNP |
| | (PhD candidate) |
| | Tel: (423) 867-2954 |
| | Email: gmolavi@mindspring.com |
| | |
| Faculty Advisor: | Dr. Debra Wallace |
| | University of Tennessee/ College of Nursing |
| | (865) 974-7596 |

APPENDIX F

Invitations to Participate in Study

If you are a *Woman*, age 50 or above, and you have been diagnosed with *Type 2 Diabetes*, and

If you manage your diabetes at home, under the direction of a physician, and/or nurse practitioner.

*YOU* can contribute to the science of nursing through your participation in this research!

*What is involved?* Completion of two written surveys that will take approximately 15-30 minutes of your time.

Your information will be kept STRICTLY confidential!

---

If you, or another woman you know with *Type 2* diabetes might be willing to participate.

Please contact the researcher:

*Gerry Ann Molavi, MSN, RN, CS, FNP*
PhD candidate
*University of Tennessee/Knoxville*
*Chattanooga number: (423) 867-2954*
or *Toll free line: 1-888-841-9348*
email: gmolavi@mindspring.com

You will be sent the packet of information, including the surveys and a self-addressed stamped envelope for their return. For your trouble I will include a gift of a pamphlet on Diabetes Management Tips and a *Gold or Silver Dollar!*
Thank you for your consideration

---

When you call, please leave your address to receive the packet of Information, or your first name and phone number if you would prefer to be interviewed in person or by telephone.

Thank you for your contribution
to
Nursing and Diabetes Research

*An Invitation for Women to Participate in Diabetes Research*

## AN INVITATION for WOMEN
## TO PARTICIPATE IN
## DIABETES RESEARCH!!

If you are a <u>woman</u> age 50 or above,

and

If you have been diagnosed with <u>Type 2 Diabetes</u>

and

If you manage your diabetes at home, under the

direction of a physician and/or nurse practitioner,

You can contribute to the science of nursing through

your participation in this research.

What is involved??

About 15-30 minutes of your time to complete 2

surveys

(by phone, interview, or in writing).


Your information will be strictly confidential!!


If you are able to participate

You will receive a small gift for your trouble.

Ask your Health Care Provider for an "Invitation" or

Please contact the researcher for more information:


Gerry Ann Molavi, RN, MSN, CS, FNP

PhD candidate

College of Nursing

University of Tennessee/ Knoxville

Tel: (423) 867-2954  Fax: (423) 867-1963

Email: gmolavi@mindspring.com

APPENDIX G

Study Instruments

# Diabetes Self-Management Questionnaire

Adapted from the Diabetes Care Profile 2.0
Michigan Diabetes
Research and Training Center
DCP2.0

© 1998 The University of Michigan

**Note: Completion of these surveys implies that you are giving informed consent to participate in this research study conducted by Gerry Ann Molavi, MSN, RN, FNP, University of Tennessee/Knoxville doctoral student**

---
| Note: | For this survey, a <u>Health Care Provider</u> refers to a doctor and/or nurse practitioner. |
---

Please answer each of the following questions by filling in the blanks with the correct answers or by choosing the single best answer.

(1)  Age: __ __ years old          (2) Birth date:  __ __ / __ __ / __ __
                                                    ( Month / Day / Year )

(3)  Zip Code: __ __ __ __ __

(4)  What is your ethnic origin/race? (check one box)     Black _____     White _____

(5)  How much schooling have you had? (Years of formal schooling completed) _____

(6)  How would you describe the insurance plan(s) you have had <u>in the past 12 months</u>?
          (check all that apply)

Private insurance____     Medicare ____     Medicaid_____     Tenn Care____Other _____

describe_____     I have not had an insurance in the past 12 months _____

(7)  Which of the categories best describes your total annual <u>combined</u> household income from <u>all</u> sources? (check one box)

| | | |
|---|---|---|
| ☐ 01 | Less than $5,000 | ☐ 06  $30,000 to $39,999 |
| ☐ 02 | $5,000 to $9,999 | ☐ 07  $40,000 to $49,999 |
| ☐ 03 | $10,000 to $14,999 | ☐ 08  $50,000 to $59,999 |
| ☐ 04 | $15,000 to $19,999 | ☐ 09  $60,000 to $69,999 |
| ☐ 05 | $20,000 to $29,999 | ☐ 10  $70,000 and over |

(8) What <u>treatment</u> (s) are <u>currently prescribed</u> by your health care provider to control your Type 2 diabetes?
                         (Check ALL that apply)

| | | |
|---|---|---|
| ☐ 01 | diet | ☐ 07  regular office visits |
| ☐ 02 | exercise | ☐ 08  stress control |
| ☐ 03 | pills (oral medications) | ☐ 09  behavior modification |
| ☐ 04 | insulin | ☐ 10  urine sugar testing |
| ☐ 05 | blood sugar monitoring (how often?_____) | ☐ 11  routine eye exams |
| ☐ 06 | HgbA1c (long term blood sugar test) if yes, how often is this checked?_____ | ☐ 12  regular inspection of feet |
| | | ☐ 13  weight loss |

Other? If so, please list _____

→ Please turn to next page →

(9) Which persons, other than yourself, are you responsible to care for, on a regular basis, at this time of your life?

(CHECK ALL THAT APPLY!)

☐ 01 children                                           ☐ 02 parent (s)

☐ 03 grandchildren                                   ☐ 04 other family member (s)

☐ 05 friend/ community member                 ☐ 06 others not listed

☐ 07 spouse or equivalent                          ☐ 07 no one beside myself


( 10) On a scale of 1-10, please give a rating to your stress level by placing a number on the line that describes your feeling of stress at this current time of your life.

(place a number on the line of either 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10)

_____

1=no stress                                                                                 10= Extreme stress


| The next few questions are about diabetes education and advice given to you: |

(11)   Has your health care provider or nurse ever told you to take special care of your feet?
            (check one box)

                        ☐ 1 No          ☐ 2 Yes          ☐ 3 Not Sure

(12)   Has your health care provider or nurse ever told you to follow an exercise program?
            (check one box)

                        ☐ 1 No          ☐ 2 Yes          ☐ 3 Not Sure

(13)   Has your health care provider or nurse ever told you to follow a meal plan or diet?
            (check one box)

                        ☐ 1 No          ☐ 2 Yes          ☐ 3 Not Sure

(14)   Have you ever received diabetes education? (for example: attended a series of classes or
            series of meetings with a diabetes educator) (check one box)

                        ☐ 1 No          ☐ 2 Yes          ☐ 3 Not Sure

For the following questions, please <u>circle</u> the appropriate response.

(circle one answer for each line)

| (15) How do you rate your understanding of: | Poor | | Good | | Excellent |
|---|---|---|---|---|---|
| a) diet and blood sugar control | 1 | 2 | 3 | 4 | 5 |
| b) weight management | 1 | 2 | 3 | 4 | 5 |
| c) exercise | 1 | 2 | 3 | 4 | 5 |
| d) use of insulin/pills | 1 | 2 | 3 | 4 | 5 |
| e) sugar testing | 1 | 2 | 3 | 4 | 5 |
| f) foot care | 1 | 2 | 3 | 4 | 5 |
| g) complications of diabetes | 1 | 2 | 3 | 4 | 5 |
| h) eye care | 1 | 2 | 3 | 4 | 5 |
| i) combining diabetes medication with other medications | 1 | 2 | 3 | 4 | 5 |
| j) alcohol use and diabetes | 1 | 2 | 3 | 4 | 5 |

Now tell about support you get from others in managing your diabetes......

(16).   My <u>family or friends</u> help and support me a lot to:

(circle one answer for each line)

| | Strongly disagree | somewhat disagree | Neutral | Somewhat agree | Strongly agree | Does not apply |
|---|---|---|---|---|---|---|
| a. follow my meal plan | 1 | 2 | 3 | 4 | 5 | N/A |
| b. take my medicine | 1 | 2 | 3 | 4 | 5 | N/A |
| c. take care of my feet | 1 | 2 | 3 | 4 | 5 | N/A |
| d. get enough physical activity | 1 | 2 | 3 | 4 | 5 | N/A |
| e. test my sugar | 1 | 2 | 3 | 4 | 5 | N/A |
| f. handle my feelings about diabetes | 1 | 2 | 3 | 4 | 5 | N/A |

→ Please turn to next page →

For the following questions, please <u>circle</u> the appropriate response.
(circle one answer for each line)

| | | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|---|---|---|---|---|---|
| 17. | I feel satisfied with my life. | 1 | 2 | 3 | 4 | 5 |
| 18. | I can do just about anything I set out to do. | 1 | 2 | 3 | 4 | 5 |
| 19. | Diabetes doesn't affect my life at all. | 1 | 2 | 3 | 4 | 5 |
| 20. | I am pretty well off, all things considered. | 1 | 2 | 3 | 4 | 5 |
| 21. | Things are going very well for me right now. | 1 | 2 | 3 | 4 | 5 |

For the following questions, please circle the appropriate response. (one answer for each line only)

| | | Never | | Sometimes | | Always | Don't know |
|---|---|---|---|---|---|---|---|
| 22. | I keep my blood sugar in good control | 1 | 2 | 3 | 4 | 5 | 0 |

For the following questions, please circle the appropriate response. (one answer for each line only)

| | | Never | | Sometimes | | Always |
|---|---|---|---|---|---|---|
| 23. | I keep my weight under control. | 1 | 2 | 3 | 4 | 5 |
| 24. | I do the things I need to do for my diabetes (diet, medicine, exercise, etc.). | 1 | 2 | 3 | 4 | 5 |
| 25. | I feel dissatisfied with life because of my diabetes. | 1 | 2 | 3 | 4 | 5 |
| 26. | I handle the feelings (fear, worry, anger) about my diabetes fairly well. | 1 | 2 | 3 | 4 | 5 |

(27)    In general, would you say your health is:        (check one box ONLY)

☐₁            ☐₂            ☐₃            ☐₄            ☐₅
Excellent      Very Good       Good          Fair          Poor

→ Please turn to next page →

(28) How old were you when you were **FIRST** diagnosed with diabetes??_____

(29) What treatment did your Health Care Provider prescribe when you were **FIRST** diagnosed with diabetes?

<div align="center">(check ALL that apply)</div>

| | | | | |
|---|---|---|---|---|
| ☐ 01 | diet | ☐ 07 | regular inspection of feet |
| ☐ 02 | exercise | ☐ 08 | stress reduction |
| ☐ 03 | pills (oral medications) | ☐ 09 | behavior modification |
| ☐ 04 | insulin | ☐ 10 | urine sugar testing |
| ☐ 05 | blood sugar monitoring (how often?_____) | ☐ 11 | routine eye exams |
| ☐ 06 | HgbA1c (long term blood sugar test. If prescribed, how often were you told to have it done?_____) | ☐ 12 | diabetes education |
| | | ☐ 13 | weight loss |

Other? If so, please explain_____

(30) What **type** of Health Care Provider is the MAIN person who helps you with your diabetes management?

Physician_____ Nurse Practitioner_____ Office Nurse _____ Dietician_____ Physician Assistant _____

Other_____ Who?_____(give category of health provider only, not name)

<div align="center">

Thank you so much for completing the <u>first</u> questionnaire.

Please complete the Health Self-Determinism Index on the next page.

</div>

After both questionnaires are completed, place them (pages 2-7) in the accompanying stamped enveloped addressed to the researcher and mail them as soon as possible.

Do not include your name or any identifying information on any page of the surveys.

## Health Self Determinism Index

Please circle the answer for each question that tells how you feel

|   | Question | Strongly disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|----------|-------------------|----------|---------|-------|----------------|
| 1 | I need more willpower | 1 | 2 | 3 | 4 | 5 |
| 2 | I know what to do without contacting MD | 1 | 2 | 3 | 4 | 5 |
| 3 | Only MD knows if I'm in good health | 1 | 2 | 3 | 4 | 5 |
| 4 | Some people think MD should decide about my health, but I think I should | 1 | 2 | 3 | 4 | 5 |
| 5 | I worry about my health | 1 | 2 | 3 | 4 | 5 |
| 6 | Whatever the MD suggests is okay | 1 | 2 | 3 | 4 | 5 |
| 7 | I know, without someone telling me, when I'm in good health | 1 | 2 | 3 | 4 | 5 |
| 8 | I agree with MD and nurses instead of forming my own opinion | 1 | 2 | 3 | 4 | 5 |
| 9 | I feel good about how I take care of my health | 1 | 2 | 3 | 4 | 5 |
| 10 | I do things to help my health without MD/RN | 1 | 2 | 3 | 4 | 5 |
| 11 | I'm never sure I'm doing the right things unless I check with MD | 1 | 2 | 3 | 4 | 5 |
| 12 | My own ideas are better than those of MD | 1 | 2 | 3 | 4 | 5 |
| 13 | I don't do as well at taking care of my health as others | 1 | 2 | 3 | 4 | 5 |
| 14 | I prefer that MD/RN help me plan my health care | 1 | 2 | 3 | 4 | 5 |
| 15 | I know, without MD/RN that I'm doing the right things for my health | 1 | 2 | 3 | 4 | 5 |
| 16 | What MD/RN thinks is more important than what I think | 1 | 2 | 3 | 4 | 5 |
| 17 | I know what I'm doing when it comes to taking care of my health | 1 | 2 | 3 | 4 | 5 |

Instrument developed by Dr. C.L. Cox, 1987

**Please** mail the pink pages only in the stamped envelope included in the packet. **Do NOT** include your name or any identifying information on any page of the surveys.

**Thank you for your participation!!**

# APPENDIX H

## Gift Pamphlet

*Did You Know???*

*Facts and Tips for Women with Type 2 Diabetes*

*by*

*Gerry Ann Molavi, MSN, CS, FNP*
*PhD Candidate,*
*College of Nursing,*
*University of Tennessee/Knoxville*

*December, 2000*

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Diabetes Management requires a team effort on the part of the patient, the Health Care Provider, family and friends. It is NOT easy, nor really possible to manage alone. Hopefully your Health Care Provider uses the

C - A - R - E approach to diabetes treatment....

C - Caring and compassion for your unique situation

A - Assessment of your needs and prompt interventions

R - Research findings used in current treatment

E - Education and empowerment strategies aimed at helping you in your Diabetes Self-Management

However, YOU are the key member of the CARE team. You need to keep your Health Care Provider informed of your self management efforts: what works, what doesn't, what you are able to do, and not do (because of cost, or your need for instructions, etc).

After all, it is YOUR life and lifestyle being threatened by diabetes when it is out of control.

Fortunately, women are known to be survivors. So, take charge of your life and join the Health Care Team in controlling your diabetes for YOUR health's sake. Successful survival depends on it!!

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### First, some facts: These are the scary ones.....

Did you know that...

Women with Type 2 diabetes who take hormone replacement therapy (HRT) for menopause symptoms are NOT necessarily protected from heart problems as are women on HRT without diabetes.*

Women with first time heart attacks who have Type 2 diabetes have been shown to have a higher death rate than men who both do and do NOT have diabetes!*

Research has been reported that linked lower brain function with Type 2 diabetes in women!!!*

Patients who do NOT manage their diabetes well will have more than twice the number of hospitalizations as others in their same age groups.*

In 1997 more than 10 million dollars were paid "out of pocket" by persons with diabetes for care that insurance did not cover, mostly for non-covered hospital costs and medications.*

Type 2 diabetes is the 4th leading cause of death in African-American women, affecting 23.4% of women over the age of 55 in this race.*

The average cost of blood sugar testing is approximately $35.00/month (for one time/day only!).

### Now some encouraging facts....

Women (ages 65+) have been shown to be more highly motivated to practice good health habits than younger women* (comparative studies with middle-aged women are lacking)

Diabetes management strategies that target control of blood sugar, high blood pressure and cholesterol, at the same time, offer the highest protection against heart, nerve and circulation complications.*

Even a 10% reduction in weight can improve blood sugar levels.*

The most successful diabetes management strategies have included a "personalized approach" by Health Care Professionals, and support from family and friends.*

Developing a "positive attitude" and using a "team approach" has been shown to result in dramatic improvement in diabetes control.*

New medications and testing supplies make diabetes management and control easier than ever before.

New dietary guidelines allow more flexibility in diet planning, including the elimination of the need to buy "sugar free" foods. Now we "count carbs" for a more realistic approach.

Money spent for diabetes control can reduce money spent for hospitalizations and medications needed for diabetes "out of control".

### Now for the Tips!

1. Do NOT try to manage your diabetes alone. It takes a team effort. A friend or "buddy" can help you to stay motivated and might start exercising with you as well. Also, let your buddy know what medications you are taking, and the emergency plan for low blood sugar.

2. Stress affects your blood sugar!! So, not only should you try techniques to lower your stress, but you should let your Health Care Provider know when a stressful event has occurred. It may affect your sugar control!

3. Buy a notebook to use as a journal. Remember the old "diary" we used to keep?? In this one, make a note every day about your exercise, food intake and blood sugars. Also note if a stressful event occurred. You'll be amazed at the picture you reveal when you look back in about a month.

4. Share your journal with your Health Care Provider (the blood sugars and stress part for sure, other stuff is optional)

5. Reward yourself when you've had a good week with blood sugar control (just don't make it FOOD).

6. Take care of your skin at all times. Winter is hard on skin. Use good lotions, and do NOT soak in the tub. Use cornstarch to dust under your breasts to avoid chafing (make sure you do NOT have an infection first). Put a strip of soft, white cotton under your bra band in front, after you dust. The extra padding with cornstarch works miracles! You can add a few drops of your favorite cologne to the cornstarch too!!

7. Finally, keep a good sense of HUMOR! It makes it all easier!

## VITA

Gerry Ann Griffin Molavi was born in Chattanooga, Tennessee on March 22, 1945. She attended public schools in Chattanooga and graduated from the Baroness Erlanger School of Nursing with a diploma in 1966. The same year she married and moved to Teheran, Iran, where she lived for 14 years. In Iran she worked in women's health, drug and alcohol counseling, school health and taught Farsi language and mother-baby classes to Americans. While in Iran she attended the University of Teheran, majoring in culture and language. After the revolution in Iran she moved to Europe for one year and returned to Chattanooga, Tennessee in 1981.

Since returning to the United States she worked at Hutcheson Medical Center in Ft. Oglethorpe, Georgia from fall 1981 through December, 1992, as a staff nurse in medical/surgical nursing, the hospital and community Diabetes Educator, Director of the Medical/Surgical Nursing Department, Director of the Outpatient Department and Director of the Diabetes Program. The last position was Director of Educational Services. While at Hutcheson Medical Center she started the Outpatient Department and developed a diabetes education program that became nationally recognized by the American Diabetes Association. In 1985 she was awarded "Patient Educator of the Year" in the Greater Chattanooga area and served on the Board of Directors of the American Diabetes Association in Chattanooga for 8 years.

In 1993 she left Hutcheson to complete her BSN at the University of Tennessee at Chattanooga (UTC) and to enter graduate school thereafter. While working on her graduate degrees she worked part-time as a staff nurse in several

hospitals and as a home health nurse. In 1995 she graduated with a Master of Science in Nursing degree from UTC. In 1997 she completed a post-Master's certificate as a Family Nurse Practitioner at UTC. While a graduate student she also worked as a grant writer for the nursing program. She served as co-director on 2 federally funded grants, and served as writer on another federally funded grant to develop the nurse-anesthetist concentration in the School of Nursing graduate program.

Since 1995 she has taught community health nursing at UTC, where she is an Assistant Professor. In 1996, with the help of a community-funded grant, she developed a program (the CARES Project) to deliver school health services to inner-city schools in Chattanooga as a method of teaching community health in a service-learning framework. In 1999 she expanded the CARES Project to include services for elders in the Chattanooga area. In 1996 she was honored as a "Friend of Education" by the Hamilton County teachers association. In 2001 she was awarded the "Outstanding Faculty" award from the UTC nursing department faculty. Gerry is a member of the Zeta Alpha chapter of Sigma Theta Tau, the Golden Key Honor Society and was recently inducted into Phi Kappa Phi Honor Society at the University of Tennessee/ Knoxville. She serves on the Regional Health Council of the Greater Chattanooga area, the Hispanic Health Task Force, and is a member of numerous professional organizations. In August, 2001 she graduated from the College of Nursing at the University of Tennessee in Knoxville with a PhD in nursing and a minor in gerontology. Her research interests are in diabetes self-management and health of the aging woman.