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West Virginia Registered Dietitians' Knowledge and Attitudes of Diabetes Care

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WEST VIRGINIA REGISTERED DIETITIANS'

KNOWLEDGE AND ATTITUDES OF DIABETES CARE

by

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ABSTRACT

West Virginia Registered Dietitians'
Knowledge and Attitudes of Diabetes Care

by

Marie R. Gravely, R.D., L.D., C.D.E.

This study addresses diabetes knowledge and attitudes of West Virginia dietitians as they relate to Medicare certified provider guidelines. A questionnaire was developed using the Diabetes Attitude Scale, questions from A CORE Curriculum for Diabetes Education, and demographic questions addressing length and type of practice, route to registration, and specialty credentials. Responses were analyzed to determine overall knowledge and attitude as well as how demographic information affects knowledge and attitude. Results indicated demographic information (except for specialty credentials and hours working with diabetes) did not have a significant effect on the dietitian's diabetes knowledge and attitude. Specialty credentials did have a significant effect on knowledge while hours working with diabetes had a significant effect on attitude. This study indicates West Virginia dietitians need additional education to provide quality services authorized by Medicare legislation in 2000. Results also indicated dietitians have a strong positive attitude regarding diabetes care.

ACKNOWLEDGMENTS

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CHAPTER I

Introduction

Diabetes is a chronic disease characterized by elevated blood glucose levels. There is no known cure. Diabetes affects every organ system of the body and can negatively affect one's quality of life. In 1985 an estimated 30 million people worldwide had diabetes. In a little over ten years that number has risen to 150 million people. (Diabetes Atlas, 2000) The World Health Organization (WHO) has warned that diabetes has reached epidemic proportions with the number of people having diabetes anticipated to reach 300 million by 2025.

The prevalence of diabetes worldwide is estimated to be 4.6% in the 20 to 79 year age bracket. The Western Pacific Region of the world has the highest number of people with diabetes (44 million) however; their prevalence rate is 3.6%. The North American and the Middle East regions have prevalence rates of 7.8% and 7.7% respectively. The five countries with the largest numbers of people with diabetes are India (32.7 million), China (22.6 million), the United States (17.0 million), Pakistan (8.8 million) and Japan (7.1 million). (Diabetes Atlas, 2000)

The prevalence of diabetes is highest in developed countries but developing countries are expected to have the largest increase in the next decade. The prevalence of diabetes in developing countries is expected to increase by 170% between 1995 and 2025 compared to 41% in developed countries. (Diabetes Atlas, 2000) The rapid rise of diabetes in developing countries is associated with economic development, westernization and urbanization, all of which are contributing factors to an increasing prevalence in these countries.

In 2000, 17.0 million people in the United States, 6.2% of the population, had diabetes. Approximately 11 million people have been diagnosed and 5.9 million Americans are unaware they have diabetes. (National Estimates on Diabetes and General Information on Diabetes in U.S., 2002, 2002) It is estimated that the number of Americans diagnosed with diabetes in 2050 will increase to 29 million (a prevalence of 7.2%). (Boyle, 2001) This projected increase is due to an aging population, unhealthy lifestyle, and an increase in obesity.

In 1994, 14 states had an age-adjusted diabetes prevalence rate of 4% or lower and only 2 states had an age-adjusted prevalence rate of 6% or higher. In 2000, no states had an age-adjusted prevalence rate of 4% or less while 23 states had an age-adjusted prevalence rate of 6% or higher. Mississippi (7.7%, up from 6.1% in 1994), Alabama (7.3% up from 4.2% in 1994), District of Columbia (7.1%, up from 4.6% in 1994), South Carolina (6.9% up from 5.6% in 1994) and West Virginia (6.9% up from 4.7% in 1994) were the top five states in age-adjusted diabetes prevalence. (Diabetes Surveillance System, 2000)

In 2000, the Behavioral Risk Factor Surveillance System (BRFSS) revealed West Virginia's prevalence rate was 7.6% for adults 18 years and older. This translates to approximately 107,000 people having been diagnosed with diabetes with an additional 53,000 undiagnosed cases (The Burden of Diabetes in West Virginia, 2002). West Virginia ranks second in prevalence of diabetes among the 52 states and territories. West Virginia has consistently, for the past 10 years, had a higher prevalence rate than the United States average.

Diabetes, as with any chronic diseases, requires continuous medical care and patient education. The goal is to prevent acute complications and reduce the risk of chronic complications. A variety of medical, pharmacological, and educational interventions are utilized to meet this goal. The types of interventions will vary from individual to individual.

Diabetes care is almost always carried out entirely by the individual with diabetes and/or family members. To achieve optimal care, the individual must be prepared to be an effective self-manager of his/her diabetes and must have a health care team that will assist in monitoring, supporting, and providing routine medical care.

Education is a key component to becoming an effective self-manager of diabetes. An individual needs to understand diabetes, its management options, its personal and financial costs and its affect on one's social and psychological well-being. This knowledge can empower the individual to become a more effective self-manager. (Norris, 2001).

DSME provides the individual with diabetes an opportunity to learn and incorporate successful diabetes interventions. (Norris, 2001). DSME incorporates the expertise of a variety of health care professionals who may or may not be certified diabetes educators. Typically, the physician, the nurse diabetes educator, the pharmacist and the dietitian are members of the DSME team.

The treatment approach of the DSME team is based on the team's attitude towards diabetes care. An individual's attitude toward a particular behavior represents the person's beliefs regarding that behavior. Studies have shown a difference in attitudes amongst the DSME team members with physicians having the greatest difference. (Anderson, 1991)

The dietitian plays an important role in DSME. The dietitian is knowledgeable in the food and nutrition aspect of diabetes care. The dietitian can assist the individual with diabetes in developing and implementing lifestyle changes to improve glycemic control. Successful nutrition lifestyle changes are dependent on the individual with diabetes and the dietitian working together to determine realistic goals for change. (Diabetes Care and Education Dietetic Practice Group, 2000)

The dietitian's attitude towards DSME has been shown to be positive toward the team approach to diabetes care and patient autonomy. These studies have compared dietitians with other disciplinary team members. (Anderson, 1991)

Legislation documents dietitians as certified providers of Medicare benefits for patients with diabetes in 2000. (Quick guide to the Medicare medical nutrition therapy (MNT) benefit, 2002) With this recognition, the American Dietetic Association medical nutrition therapy guidelines for type 1 and type 2 diabetes were identified as the standard of care for dietitians to become certified providers. These guidelines provide a framework of knowledge and skills the dietitian will utilize to provide quality diabetes care.

A study specific to the dietitian's knowledge and/or attitude regarding diabetes care was not found in the literature. The purpose of this study is to survey dietitians living in West Virginia to identify their knowledge and attitude toward diabetes care. The results of this study will identify the West Virginia dietitian's readiness to meet the 2000 Medicare benefits guidelines.

Hypotheses

The hypotheses for this study are:

<u>Knowledge of Diabetes Care</u>

1. Dietitians are more knowledgeable in "Medical Nutrition Therapy" than in "Chronic Complications", "Macrovascular Disease", and "Pathophysiology".

2. Dietitians are more knowledgeable in "Lifestyle for Diabetes Prevention" than in "Chronic Complications", "Macrovascular Disease", and "Pathophysiology".

3. A positive correlation exists between the number of years as a registered dietitian and the level of knowledge.

4. The route to dietetic registration does not influence the level of knowledge.

5. Specialty credentials in diabetes (CDE) have a positive influence on the level of knowledge.

6. Dietitians in clinical practice (inpatient and outpatient) have a greater level of knowledge than other practice groups.

7. A positive correlation exists between the number of hours working with people with diabetes and the level of knowledge.

Attitude of Diabetes Care

8. A positive correlation exists between the number of years as a registered dietitian and level of attitude.

9. The route to dietetic registration does not influence level of attitude.

10. Specialty credentials in diabetes (CDE) have a positive influence on attitude.

11. Dietitians in clinical practice (inpatient and outpatient) have a greater level of attitude than other practice groups.

12. A positive correlation exists between the number of hours working with people with diabetes and level of attitude.

Assumptions and Limitations

Assumptions

➢ Dietitians with CDE credentials may be aware that the knowledge questions were taken from <u>A CORE Curriculum for Diabetes Education</u> (<u>The CORE Curriculum</u>) and thus answer the questions with 100% accuracy.

➢ The knowledge questions from <u>The CORE Curriculum</u> are reliable and valid.

➢ The sample size included all dietitians in West Virginia suggesting the results describe the entire population.

Limitations

➢ West Virginia dietitians are not accustomed to being surveyed. This fact may result in a lower response rate.

➢ The response time for completing the survey was limited to approximately two weeks after receiving the survey. Additional surveys were received after this time.

➢ The survey was distributed in early June, which may have resulted in a decrease in response due to seasonal obligations.

➢ The length of the survey (62 questions) may have influenced the response rate.

➢ The knowledge portion of the survey was limited to 23 questions, which may not provide adequate information regarding the dietitian's diabetes knowledge.

➢ The knowledge questions may be too complex for the average clinical dietitian to answer correctly.

Definitions of Terms Used

A CORE Curriculum for Diabetes Education (The CORE Curriculum)—a four volume set of information for diabetes education and management. This set of books is the authoritative source of information for the diabetes educator.(A CORE Curriculum for Diabetes Education, Fourth Edition, 2001)

American Association of Diabetes Educators (AADE)--a multidisciplinary organization representing over 10,000 healthcare providers/professionals who provide diabetes education and care.

American Dietetic Association (ADA)—an organization of nearly 70,000 members promoting nutrition and well-being for all people.

Certified Diabetes Educator (CDE)—registered nurse, registered dietitian, occupational therapist, pharmacist, physical therapist, physician, physician assistant, or podiatrist with a core knowledge and skills of diabetes management and a minimum of 1000 hours of experience in diabetes self-management education. (Diabetes Care and Education Dietetic Practice Group, 2000)

Clinical Dietitian—a registered dietitian working in an inpatient or outpatient setting.

Diabetes Care and Education dietetic practice group (DCE)—a practice group of the American Dietetic Association promoting quality diabetes care and education.

Diabetes Educator—a health professional who has mastered the core knowledge and skills in biological and social sciences, communication, counseling, and education and has a specific amount of experience in the care of persons with diabetes. (American Association of Diabetes Educators, 2000)

Diabetes Mellitus—"A metabolic disorder with multiple etiologies characterized by chronic hyperglycemia with disturbances of carbohydrate, fat, and protein metabolism resulting from defects in insulin secretion, insulin action or both." (Definition, Diagnosis and Classification of Diabetes Mellitus and its Complications, 1999)

Diabetes Self-Management Education (DSME)—a process that includes assessing the individual and/or caregiver of diabetes, developing and implementing an education plan, and documenting of all education encounters. (Mensing, 2002)

Glycemic control—control of blood glucose levels.

Healthcare provider—a physician, certified nurse practitioner, or physician assistant.

Medical Nutrition Therapy (MNT)—"use of specific nutrition services to treat an illness, injury, or condition and involves two phases: 1) assessment of the nutritional status of the client and 2) treatment, which includes nutrition therapy, counseling and the use of specialized nutrition supplements."(Pastors, 2002)

Patient autonomy—patient's independence in making decisions regarding diabetes management and care.

Registered Dietitian (dietitian)—a food and nutrition expert completing a minimum of a baccalaureate degree and supervised practice program and has passed the Dietetic Registration examination. (Diabetes Care and Education Dietetic Practice Group, 2000)

CHAPTER II

Review of Literature

<u>Diabetes Education</u>

People with diabetes are ultimately responsible for managing their diabetes control. Frequently lifestyle changes are necessary to improve their diabetes control. The person with diabetes has three basic responsibilities for the self-management of diabetes. (Anderson, 1999) First, the person with diabetes makes the most important choices affecting their health and well being. Second, the person is in control of their diabetes self-management. And lastly, the person with diabetes faces the consequences of their choices.

Diabetes education provides the individual with knowledge and skills to make lifestyle changes and control their diabetes. Diabetes education provides the person with diabetes an understanding of diabetes and its management, treatment options, and costs and benefits of treatment. Understanding these concepts, however, does not assure the person with diabetes success in their diabetes management.

Studies have shown that health beliefs and self-efficacy have an effect on an individual's ability to make lifestyle changes. (Aljasem & Rumin, 2001) For this reason, diabetes education is more than telling people with diabetes what to do.

In the 1980's diabetes education moved from an adherence-based approach to an empowerment-based approach. The individual's success in self-management is based on the individual's selection of obtainable outcomes. Empowerment is achieved by emphasizing the individual's strengths, transferring leadership from the educator to the individual, seeing failures as problems to be solved and by expanding the individual's participation. (Davis, 1999)

The empowerment approach to diabetes education requires the diabetes care professional to shift from "This is what you should do to control your diabetes" to "There are a variety of options for managing diabetes, and here are the likely consequences of each option. Do any of these options fit with your life and situation?" (Rubin, 2002)

Self-management education assists the individual with diabetes to know and understand diabetes and its management, available treatment options, personal costs and benefits of various treatment options, and behavior change and problem-solving strategies. Self-management education also helps these individuals identify their own goals, values and feelings regarding diabetes. With self-management education, the individual with diabetes becomes aware of their role as the decision maker and begins to take responsibility for their day-to-day diabetes care.

Diabetes self-management education obtains the most effective outcomes with an interdisciplinary team of educators (Norris, 2001). The team can represent a variety of disciplines with the individual with diabetes as the team leader. The core team members ideally should include the health care provider, the nurse educator, and the dietitian educator. Other disciplines that may be part of the team include, but are not limited to, the, pharmacist, exercise physiologist, podiatrist, social worker, optometrist/ophthalmologist, and mental health professionals. The goal of the health care team is to provide information to assist in goal setting and problem solving.

Dietitian's Role in Diabetes Education

The role of the dietitian as a member of the diabetes health care team was demonstrated in the Diabetes Control and Complications Trial (DCCT)(DCCT Research Group, 1993) and the United Kingdom Prospective Diabetes Study (UKPDS)(UKPDS Group, 1998). The dietitians in these studies proved to be a key team member by providing medical nutrition therapy (MNT) and self-management training.

A dietitian has the credential RD (registered dietitian), which indicates the person, has received training in food and nutrition and how it relates to diabetes care. The RD has completed a minimum of a baccalaureate degree and 900 hours of supervised dietetic practice experience and has passed a national registration examination. (Diabetes Care and Education Dietetic Practice Group, 2000)

The role of the dietitian as a member of the diabetes self-management team has expanded over the past 10 years. The Balanced Budget Act of 1997 provided for Medicare benefits for diabetes self-management education by a certified provider. The American Dietetic Association promoted the dietitian as a certified provider of diabetes self-management education because of their expertise in Medical Nutrition Therapy and their recognition as an essential member of the diabetes treatment team. ("ADA promotes dietitian's role as a 'certified provider' of diabetes self-management training under Medicare Part B," 1998) In December 2000 President Clinton signed legislation that included dietitians as certified providers of Medicare benefits for patients with diabetes or kidney disease.

The Diabetes Care and Education (DCE) dietetic practice group of the American Dietetic Association recognizes the dietitian as a diabetes educator because of their knowledge and experience in biological and social sciences, communication, and counseling as it relates to diabetes. The DCE dietetic practice group revised the "1995 Scope of Practice for Qualified Professionals in Diabetes Care and Education" in 2000. The revised scope of practice of the dietitian as a diabetes educator is illustrated in Table 1.

Table 1 Comparison Of The Scope Of Practice For Diabetes Educators And
Registered Dietitians

Diabetes Educator (American Association of Diabetes Educators, 2000)	Specific to the Registered Dietitian (Diabetes Care and Education Dietetic Practice Group, 2000)
Assessment of educational needs	❖ Nutrition assessment ❖ Assess person's readiness for change and negotiate goals
Planning of the teaching-learning and behavioral change process	❖ Guide client to establish problem-solving skills ❖ Utilize a variety of nutrition interventions and behavior management approaches
Implementation of the educational plan	❖ Provide information on pathophysiology of diabetes and an overview of diabetes management ❖ Provide individualized meal plan including modifications for complications of diabetes ❖ Coordinate exercise and nutrition management strategies ❖ Review the effect of insulin or oral diabetes medication on blood glucose levels ❖ Explain management of hypoglycemia and hyperglycemia ❖ Provide sick-day guidelines for food intake
Documentation of the process including follow-up with the primary care provider	❖ Refer clients to other health professionals, as needed ❖ Document assessments, interventions, and outcomes
Evaluation based on outcome criteria	❖ Evaluate and adjust meal plan and goals based on blood glucose levels ❖ Interpret laboratory results and recommend changes in therapy ❖ Monitor outcomes of medical nutrition therapy, and revise therapy as needed ❖ Monitor and collect data on referral patterns and reimbursement practices

As a diabetes educator, the dietitian can assess educational needs with a nutrition assessment. The dietitian can also assess an individual's readiness to make lifestyle changes. Upon completing the assessment, the dietitian can assist the client to develop problem-solving skills to support lifestyle changes. The dietitian has a variety of interventions available to promote behavior change.

The dietitian has been trained to document all activities with a client. This documentation is used to evaluate interventions and address the need for referrals and/or intervention/goal changes.

<div align="center">Knowledge of Diabetes Care</div>

The dietitian, as a member of the diabetes care team, is able to explain the relationship between eating, insulin/oral medication dosage, and episodes of hypoglycemia and hyperglycemia. The dietitian must be knowledgeable in overall diabetes management to be able to incorporate medical nutrition therapy into diabetes care. (American Dietetic Association, 2002)

In 2001, The American Dietetic Association developed the "Nutrition Practice Guidelines for Type 1 and Type 2 Diabetes Mellitus" (NPG) to ensure the use of evidence-based guidelines in the treatment of diabetes. The NPG also outlines the scope of practice for the dietitian in diabetes care. (American Dietetic Association, 2001)

Diabetes medical nutrition therapy is no longer just pre-printed diet sheets, calculated meal patterns, or computer-generated meal plans. The dietitian utilizes various education and counseling approaches to meet the individually unique needs of the person with diabetes. The NPG identifies eight initial nutrition interventions for the dietitian to implement with the individual with diabetes. The interventions are listed in Table 2.

Table 2 Initial Diabetes Medical Nutrition Therapy Interventions

Long-term goals	❖ Identify patient and health care team long-term management goals (target glucose levels, HgbA1C, weight, lipids, blood pressure, and others as appropriate) ❖ Emphasize healthy lifestyle ❖ Review reduction of risk factors and long-term complications
Nutrition prescription	❖ Determine nutrition prescription based on: nutrition history, treatment modality, treatment goals, and concurrent medical conditions
Food/meal planning and survival skills	❖ Discuss basic nutrition and diabetes nutrition guidelines (what, when, and how much to eat) ❖ If treated with medications, emphasize importance of eating meals and snacks consistently ❖ Review signs/symptoms and treatment of hypoglycemia ❖ Discuss diabetes nutrition guidelines (carbohydrates, lipids, sodium, cooking/shopping techniques, etc.) based on individual's readiness or interest
Educational tools	❖ Select appropriate meal-planning approaches and materials
Blood glucose monitoring	❖ Teach glucose self-monitoring ❖ Review target glucose levels
Exercise	❖ Discuss exercise recommendations
Short-term goal setting	❖ Discuss eating, exercise, and blood glucose monitoring behaviors ❖ Identify and discuss short-term (1-2 weeks) behavioral goals that are specific and achievable ❖ Focus on changing only one or two specific behaviors at a time
Follow-up	❖ Provide record-keeping forms (food, exercise, glucose monitoring) ❖ Determine follow-up plans

(American Dietetic Association, 2001)

The eight initial nutrition interventions include long and short-term management goals. These goals are based on the individual's nutritional and educational needs and are developed with the client and diabetes management team. The dietitian develops the educational plan to address the nutrition prescription, meal planning and survival skills needs, blood glucose monitoring and exercise needs. The dietitian incorporates follow-up into the plan to assess the individual's progress. Examples of these skills are found in Table 2.

The NPG also identifies essential patient education topics for diabetes medical nutrition therapy (Table 3). Implementation of the interventions and topics are based on the individual's readiness to change current behaviors. The dietitian may address issues of meal planning, exercise, blood glucose monitoring and medication and food effects on blood glucose levels as it relates to hypoglycemia and hyperglycemia. Additional issues such as (but not limited to) chronic complications, pathophysiology and macrovascular disease may also be discussed upon the laboratory data results, physician referral or individual request.

Attitudes of Diabetes Care

With the recent changes in the dietitian's role in diabetes self-management, the dietitian may need to make changes in his/her beliefs and attitudes toward diabetes self-management. The attitude of the health care professional has a great impact on the quality of care received by the individual with diabetes. (Larme, 1998) The National Diabetes Commission's 1975 report to Congress stated that negative diabetes patient outcomes are associated with inappropriate attitudes of health-care professionals. (Department of Health, 1975)

Anderson and his colleagues developed and revised the "Diabetes Attitude Scale" instrument to assess the attitudes of the healthcare professional and patients with diabetes. (Anderson, 1998) The scale is divided into five subscales: need for special training, seriousness of type 2 diabetes, value of tight control, psychosocial impact of diabetes, and patient autonomy. Multiple studies of various healthcare professionals have used this instrument.

Table 3 Essential Patient Education Topics for Diabetes Medical Nutrition
 Therapy

Level of Education	Education Topics
Basic Survival Skills for all individuals with diabetes	❖ Basic food/meal plan guidelines ❖ Exercise guidelines ❖ Signs, symptoms, treatment, and prevention of hypoglycemia (if on oral agent or insulin) ❖ Nutritional management during short-term illness ❖ Self-monitoring of blood glucose skills ❖ Plan for continuing care
Essential skills/knowledge for ongoing self-management. Topics of discussion determined by individual's lifestyle, level of nutrition knowledge, and readiness for change.	❖ Source of carbohydrates, protein, fat ❖ Nutrition labels/Grocery shopping guidelines ❖ Eating out, restaurant, cafeteria, and fast food choices/Snack choices ❖ Modifying fat intake ❖ Use of sugar-containing foods/Dietetic foods and sweeteners ❖ Alcohol guidelines ❖ Using blood glucose monitoring for problem solving and identification of blood glucose patterns ❖ Adjusting meal times/ Working rotating shifts (if needed)/ Brown bag lunches/Travel, schedule changes ❖ Adjusting food for exercise ❖ Behavior modification techniques ❖ Exchanges ❖ Recipes, menu ideas, cookbooks ❖ Birthdays, special occasions, holidays ❖ Vitamin, mineral, other nutritional supplements

(American Dietetic Association, 2001)

Anderson et al (Anderson, 1991) determined that overall diabetes-related attitudes of nurses and dietitians were more positive than the attitudes of physicians. Fisk et al and Schapansky et al identified physician assistant students and pharmacist, respectively, as having overall strongly positive attitudes towards diabetes.(Fisk, 2001; Schapansky, 2000)

Diabetes specialists, spending > 50% of their time with patients with diabetes, have a higher overall attitude towards diabetes than do non-specialists, those spending <50% of their time with patients with diabetes. (R. M. Anderson, Donnelly, M.B., Davis, W.K., 1992) Among nurses, dietitians, and physicians, there is a greater difference in attitude between nurse and physician specialists and nurse and physician non-specialist. There is less of a difference in attitude between dietitian specialists and dietitian non-specialists. (Anderson, 1991)

Need for Special Training

"Need for health care professionals who care for patients with diabetes to have special training in teaching, counseling, and behavior change techniques." (Anderson, 1998)

Nurses, dietitians, pharmacists, and physician assistant students have been found to be positive in their support for the need for special training to treat diabetes. (Anderson, 1998; Fisk, 2001; Schapansky, 2000) Physicians, however, have a less positive attitude toward special training. (Anderson, 1998)

Dietitians have identified "enhancing patient adherence", "individualizing behavior change plan with a patient", "weight loss and diabetes" and "relationship among nutrition, medication, and exercise" as areas of need for special training. (R. M. Anderson, Arnold, M.S., Donnelly, M. B., Funnell, M.M., Johnson, P.D., Oh, M.S., 1992)

Seriousness of Type 2 Diabetes

"Seriousness of type 2 diabetes" (Anderson, 1998)

Physicians score significantly lower in attitude in this area than nurses and dietitians. Nurses and dietitians have a strong positive attitude but have no significant difference in their attitude regarding the seriousness of type 2 diabetes. (Anderson, 1998) Pharmacists have a neutral attitude in this subscale. (Schapansky, 2000)

Value of Tight Control

"The potential benefit of tight glucose control is justified in terms of the cost to the patient" (Anderson, 1998)

There is no significant difference between nurses and dietitians regarding their strong positive attitude to this area. Physicians have a lesser positive attitude while pharmacists have a neutral attitude toward the value of tight glucose control. (Anderson, 1998) (Schapansky, 2000)

Psychosocial Impact of DM

"Psychosocial impact of diabetes on the lives of people with the disease" (Anderson, 1998)

Nurses, dietitians, and physicians had positive attitudes regarding the psychosocial impact of diabetes. However, dietitians were less positive regarding this subset than any of the other five subsets. Pharmacists remained neutral regarding this subset.

Patient Autonomy

"Patients should be the primary decision makers regarding the daily self-care of their diabetes" (Anderson, 1998)

Of all the subscales, the nurses and dietitians scored the lowest in patient autonomy but continued to show a positive attitude. As anticipated, the nurse specialist and dietitian specialist had a more positive attitude than their non-specialist counterpart. (Anderson, 1991) In a study of pharmacists, Schapansky

found that pharmacists are neutral to positive in their attitude toward patient autonomy. (Schapansky, 2000)

Physicians scored significantly lower and had a neutral attitude regarding patient autonomy. (Anderson, 1998) Attitudes of recently educated physicians were more positive than those physicians educated in the past. (R. M. Anderson, Donnelly, M.B., Davis, W.K., 1992) In the past, the physicians were trained in the traditional approaches to diabetes care that incorporate the concept of the physician being in control of the diabetes management of an individual. This approach contradicts the current self-management approach to diabetes care.

The concept of the team approach to diabetes care, with the patient as the team leader, is widely accepted by the diabetes specialist but is not well accepted by nonspecialists. (R. M. Anderson, Donnelly, M.B., Davis, W.K., 1992)

CHAPTER III

Research Design

This is a descriptive study utilizing a survey approach to determine the knowledge and attitudes of West Virginia registered dietitians regarding diabetes care. The survey tool was developed and mailed to all registered dietitians living in West Virginia.

Subjects

Due to the limited number of dietitians in West Virginia, the subjects included all of the registered dietitians residing in West Virginia. The secretary of the West Virginia Dietetic Association (WVDA) was contacted via e-mail in order to request a mailing list of all registered dietitians (n=179) in West Virginia. (Appendix A) Mailing labels were received from the WVDA secretary in the spring of 2002.

Instruments

The researcher compiled the survey instrument for this study. It consisted of three components: knowledge, attitude, and demographics. (Appendix B)

Knowledge Component

Upon review of the literature, no reliable and valid survey was available to determine the dietitian's knowledge of diabetes. The knowledge component of the survey was developed using A CORE Curriculum for Diabetes Education (The CORE Curriculum). Lois Book, R.N., Ed.D., Director of Professional Relations for the American Association of Diabetes Educators, gave permission for The CORE Curriculum to be utilized in developing the knowledge component of the survey. The CORE Curriculum is an authoritative four-volume set of information used in preparation for the Certified Diabetes Educator examination. It has also become a valuable reference source for diabetes education and management. The four volumes are divided into specific topics: Diabetes Management Therapies, Diabetes & Complications, Diabetes Education & Program Management, and Diabetes in the Life Cycle and Research. (A CORE Curriculum for Diabetes

Education, Fourth Edition, 2001) Each volume contains multiple chapters with learning assessment post-test questions at the end of each chapter.

The knowledge questions were selected from the learning assessment post-test questions at the end of each chapter in the "Diabetes Management Therapies" volume of The CORE Curriculum.

Attitude Component

The attitude portion of the survey utilized the third version of the Diabetes Attitude Scale (DAS-3), with permission, from the Michigan Diabetes Research and Training Center. (Appendix C) The DAS-3 was developed at the Michigan Diabetes Research and Training Center, University of Michigan, Ann Arbor, Michigan.   The DAS-3 consists of thirty-three items with five subscales. The five subscales assess the individual's attitude towards (1) the need for special training to provide diabetes care; (2) seriousness of type 2 diabetes; (3) value of tight glucose control; (4) psychosocial impact of diabetes and (5) attitude towards patient autonomy. The DAS-3 was studied and determined to be valid and reliable as a general measure of diabetes related attitudes of patients and health care professionals. (Anderson, 1998)

Demographic Component

Six demographics questions were developed to identify the dietitian's number of years as a dietitian, route to registration, specialty credentials, number of hours working with diabetes, area of practice, and working status.

Compiling of Research Instrument

A three part survey tool was developed to determine the registered dietitian's knowledge and attitude of diabetes care. The knowledge questions were selected from The CORE Curriculum volume "Diabetes Management Therapies."

Random numbers from one through ten were generated from Research Randomizer at http://www.randomizer.com. Appendix D) Research Randomizer is a web-based computer-driven random number generator.   This program is

described as a "pseudo-random number generator" as it uses a complex algorithm (seeded by the computer's clock) that gives the appearance of randomness (Urbaniak, 2002) . Geoffrey C. Urbaniak and Scot Plous developed the program in 1997.

These generated random numbers were used to select the questions from the learning assessment post-test at the end of each chapter. A total of 23 questions were selected from a possible 91 questions (25%).

The second part of the survey tool consisted of the Diabetes Attitude Scale, in its entirety.

The third part of the survey tool was developed to identify the various types of registered dietitians completing the survey.

Pilot Testing of Research Instrument

The survey tool was pilot tested by a team consisting of a dietitian, a dietitian certified diabetes educator and a nurse certified diabetes educator. The team felt the knowledge portion of the tool was too complex for the non-CDE dietitian. The knowledge portion of the survey was revised based on these identified concerns. The revised knowledge questions were developed from the "Diabetes Management Therapies" and "Diabetes and Complications" volumes of The CORE Curriculum.

From these volumes, the five chapters; Medical Nutrition Therapy for Diabetes, Chronic Complications of Diabetes: An Overview, Macrovascular Disease, Lifestyle for Diabetes Prevention, and Pathophysiology of the Diabetes Disease State, were utilized to select the survey's knowledge questions. The same random numbers were utilized to obtained the 23 questions utilized in the final tool. (Appendix E)

Procedures

A packet consisting of an introductory letter, (Appendix F) the survey tool, scantron answer sheet and self-addressed stamped return envelope were mailed to each dietitian residing in West Virginia. Ten days after the mailing, a thank you/reminder postcard was mailed to each dietitian. (Appendix G)

Data Analysis

All data was entered into the Statistical Package for Social Sciences (SPSS) Version 11.0.1 for Windows. A faculty from Marshall University assisted with the analysis of the data. Descriptive statistics were used to determine the demographics of the surveyed dietitians. Inferential statistics identified the results of the knowledge and attitude portions of the survey. The Pearson Correlation was used to test the hypotheses and to determine significant correlation between survey results based on various demographics. A significance level of .05 was used due to the small population size.

CHAPTER IV

Results

<u>Demographics</u>

The three-part survey was mailed to 179 dietitians in West Virginia. Eleven surveys were returned undeliverable. With a valid population of 168, 66 surveys were returned with a return rate of 39.3%. Of the 66 surveys, eight surveys were missing demographic information and were eliminated from the study. It may be suggest that the questions were not seen as they were on the back of the final page. The hypotheses were analyzed with an "n" of 58 (34.5%).

Table 4 shows the number of years the surveyed dietitians have been working as well as the route of registration. The survey identified 10.3% of the dietitians have been a dietitian for 5 years or less. Dietitians practicing for 6 to 15 years made up 27.6% of the respondents. A majority of the dietitians (62.1%) have been dietitians for 16 years or longer.

The majority of those surveyed (39.7%) obtained dietetic registration via an internship. A master's degree program was the next most frequently used route with 29.3% of the participants. The Coordinated Undergraduate Program (CUP) and traineeship route to registration were each 15.5% of the participants.

Table 5 identifies dietitians with a diabetes educator certification and the number of hours dietitians work with patients with diabetes. There were only five Certified Diabetes Educators (8.6%) completing the survey. The majority of dietitians (63.8%) spent less than eight hours per week working with patients with diabetes. Ten dietitians (17.2%) spent 8 to 16 hours with people with diabetes while 12.1% spent 17 to 24 hours working with people with diabetes. Four dietitians (6.9%) spent 25 40 hours per week with people with diabetes.

Table 4 Years as Dietitian & Route to Registration

Years as Dietitian				Route to Registration		
Years	Frequency N = 58	Percent		Route	Frequency N = 58	Percent
0-5	6	10.3		Internship	23	39.7
6-10	8	13.8		Master Degree	17	29.3
11-15	8	13.8		CUP	9	15.5
16-20	14	24.1		Traineeship	9	15.5
21+	22	38.0				

Table 5 Certified Diabetes Educator & Number of Hours Working with Diabetes

Certified Diabetes Educators				Number of Hours Working with Diabetes		
Certified Diabetes Educator	Frequency N = 58	Percent		Hours	Frequency N = 58	Percent
Yes	5	8.6		< 8	37	63.8
No	53	91.4		8-16	10	17.2
				17-24	7	12.1
				25-32	2	3.45
				33-40	2	3.45

The dietitians' area of practice and working status are identified in Table 6. The majority (31.0% and 22.4% respectively) of the dietitians work in the inpatient or

outpatient clinical setting. 15.5% of the respondents worked in the management area of dietetics while 13.8% were from academia and 17.2% were in public health.

Fulltime dietitians comprised 72.4% of the population whereas 24.1% of the population worked part-time. Those dietitians not currently employed or retired made up 1.7% of the population respectively.

Table 6 Area of Practice & Working Status

Area of Practice				Working Status		
Area	Frequency N = 58	Percent		Status	Frequency N = 58	Percent
Management	9	15.5		Fulltime	42	72.4
Academia	8	13.8		Part-time	14	24.1
Public Health	10	17.2		Not currently employed	1	1.7
Inpatient Clinical	18	31.0		Retired	1	1.7
Outpatient Clinical	13	22.4				

Knowledge of Diabetes Care

Table 7 shows the results of the knowledge portion of the survey. Overall, participants' average score was 12.6379 correct (54.95%) out of 23 questions. The maximum number correct was 20 (86.95%) with the minimum number correct being six (26.09%).

Dietitians were most knowledgeable in the area of *medical nutrition therapy* with a mean score of 3.4138 (68.28%) out of five. The lowest score was one correct (20.0%) and the highest score was five (100%) correct.

Lifestyle for diabetes prevention was the second highest scored area with a mean of 2.9138 (58.28%) out of five. The minimum correct was one (20%) and the maximum was five (100%).

Dietitians received a mean score of 2.5345 (50.69%) out of five in the area of *macrovascular disease*. The minimum correct was zero and the maximum correct was five (100%).

Dietitians received a mean score of 1.8103 (36.21%) out of three in the area of *pathophysiology*. The minimum score was zero and the maximum score was three (60%).

The area of *chronic complications* received the least correct answers with a mean score of 1.7931 (35.62%) out of five. The minimum number correct was zero and the maximum number of correct was four (80%).

Table 7 Knowledge of Diabetes

	N	Minimum	Maximum	Mean	Std. Deviation
Overall Knowledge	58	6.00	20.00	12.6379	3.37534
Medical Nutrition Therapy	58	1.00	5.00	3.4138	1.18521
Lifestyle for Diabetes Prevention	58	1.00	5.00	2.9138	.99621
Macrovascular Disease	58	.00	5.0	2.5345	1.14272
Pathophysiology	58	.00	3.00	1.8103	1.05060
Chronic Complications	58	.00	4.00	1.7931	.95069

The sample mean scores were used to assess hypotheses 1-2. Hypothesis 1 addresses the dietitian's expertise in medical nutrition therapy compared to chronic complications, macrovascular disease and pathophysiology. The average mean score for medical nutrition therapy was 3.4138 ± 1.1895. For chronic complications, the mean score was $1.7931 \pm .9506$ with means scores of 2.5345 ± 1.1427 and 1.8103 ± 1.0506 for macrovascular disease and pathophysiology respectively. (Table 7)   Using a confident interval with a one tail of the t-distribution, it was determined that there is a significant difference in the sample mean scores of medical nutrition therapy, chronic complications, macrovascular disease, and pathophysiology.   Therefore, dietitians are more knowledgeable in medical nutrition therapy than in chronic complications, macrovascular disease, and pathophysiology.

Hypothesis 2 addresses the dietitian's expertise in lifestyle for diabetes prevention compared to chronic complications, macrovascular disease and pathophysiology. The average mean score for lifestyle for diabetes prevention was $2.9138 \pm .99621$. For chronic complications, the mean score was $1.7931 \pm .9506$ with means scores of for 2.5345 ± 1.1427 and 1.8103 ± 1.0506 for macrovascular disease and pathophysiology respectively. (Table 7) Using a confident interval with a one tail of the t-distribution, it was determined that there is a significant difference in the sample mean scores of medical nutrition therapy, chronic complications, macrovascular disease, and pathophysiology.   Therefore, dietitians are more knowledgeable in lifestyle for diabetes prevention than in chronic complications, macrovascular disease, and pathophysiology.

Hypotheses #3-7 were assessed using Pearson's Correlation with a significance level of .05. (Table 8) With a significance factor of .825, there is no correlation between the number of years as a registered dietitian and the level of knowledge. (Hypothesis #3) There was also no significant difference (.716) in the route to dietetic registration and the level of knowledge. (Hypothesis #4)

Table 8 Hypothesis #3-7

	Hypothesis #3	YEARS	KNOW
YEARS	Pearson Correlation	1	.030
	Sig. (2-tailed)	.	.825
	N	58	58
	Hypothesis #4	ROUTE	KNOW
ROUTE	Pearson Correlation	1	-.049
	Sig. (2-tailed)	.	.716
	N	57	57
	Hypothesis #5	SPECIAL	KNOW
SPECIAL	Pearson Correlation	1	.437
	Sig. (2-tailed)	.	.001
	N	58	58
	Hypothesis # 6	TYPE	KNOW
TYPE	Pearson Correlation	1	.119
	Sig. (2-tailed)	.	.377
	N	57	57
	Hypothesis # 7	HOURS	KNOW
HOURS	Pearson Correlation	1	.132
	Sig. (2-tailed)	.	.323
	N	58	58

There was a significant correlation in the knowledge of the dietitian with CDE credentials and the knowledge of the dietitian without CDE credentials. (Hypothesis #5) Upon further review, it was determined that the CDE credentialed dietitians had a significant increase in knowledge in the areas of medical nutrition therapy (.005), macrovascular disease (.002) and pathophysiology (.007). There was no significant difference in regard to chronic complications (.137) and lifestyle for diabetes prevention (.506). (Table 9) It would suggest that the RD and CDE have a comparable knowledge level of the subsets of chronic complications and lifestyle for diabetes prevention.

There was no significant difference (.377) in the knowledge of dietitians based on the type of practice they were in (Hypothesis #6). There was also no significant

differences based on the number of hours a dietitian worked with diabetes per week (Hypothesis #7).

Table 9 Hypothesis #5

Medical Nutrition Therapy (MNT)	MNT	SPECIAL
MNT Pearson Correlation	1	.362
Sig. (2-tailed)	.	.005
N	58	58
Chronic Complications (CC)	CC	SPECIAL
CC Pearson Correlation	1	.198
Sig. (2-tailed)	.	.137
N	58	58
Macrovascular Disease (MVD)	MVD	SPECIAL
MVD Pearson Correlation	1	.397
Sig. (2-tailed)	.	.002
N	58	58
Lifestyle for Diabetes Prevention (LDP)	LDP	SPECIAL
LDP Pearson Correlation	1	.089
Sig. (2-tailed)	.	.506
N	58	58
Pathophysiology (PATHO)	PATHO	SPECIAL
PATHO Pearson Correlation	1	.351
Sig. (2-tailed)	.	.007
N	58	58

Attitude of Diabetes Care

The attitude portion of the survey was assessed on the basis of a scale of 1=Strongly Disagrees to 5=Strongly Agrees. (Appendix H)   Subscales are presented according to the Diabetes Attitude Scale method of data analysis (Table 10). Dietitians' overall attitudes toward diabetes are very positive with an average mean of 4.4167 with a minimum score of 3.73 and a maximum score of 4.88.

Need for special training received a mean score of 4.6552 with a minimum of 3.20 and a maximum of 5.00. Attitudes towards the seriousness of type 2 diabetes received a mean score of 4.4926 with a minimum of 3.71 and maximum of 5.00. The value of tight control scored a minimum of 3.86, a maximum of 5.00 and a mean of 4.4687. Psychosocial impact of diabetes received a mean score of 4.1264 with a minimum of 3.17 and a maximum of 5.00. Patient autonomy scored a minimum of 3.38, a maximum of 5.00, with a mean score of 4.3640.

Table 10 Attitude of Diabetes Care

	N	Minimum	Maximum	Mean	Std. Deviation
Overall Attitude	58	3.73	4.88	4.4167	.27497
Need for Special Training	58	3.20	5.00	4.6552	.32830
Seriousness of Type 2	58	3.71	5.00	4.4926	.37192
Value of Tight Control	58	3.86	5.00	4.4687	.30989
Psychosocial Impact of Diabetes	58	3.17	5.00	4.1264	.46549
Patient Autonomy	58	3.38	5.00	4.3640	.38257

Pearson Correlation with a significant factor of .05 was used to assess the attitude related hypotheses 8-12. (Table 11)   There is no significant correlation in the number of years as a dietitian and the level of attitude (.554) (Hypothesis 8). The route of dietetic registration also does not have a significantly effect (.992) on a dietitian's attitude (Hypothesis 9). There is no significant correlation (.195) in attitude between dietitians with CDE credentials and dietitians without the CDE

credentials (Hypothesis 10). There is also no significant correlation (.357) in attitude based on the number of hours a dietitian works with people with diabetes (Hypothesis 11).

Hypothesis 12 addresses the correlation between the number of hours per week working with people with diabetes and the dietitian's attitude. As documented by the data, the number of hours working with people with diabetes does have an affect on the attitude of the dietitian.

Table 11 Hypothesis #8-12

Hypothesis #8		YEARS	ATTITUDE
YEARS	Pearson Correlation	1	.081
	Sig. (2-tailed)	58	.554
	N		56
Hypothesis #9		ROUTE	ATTITUDE
ROUTE	Pearson Correlation	1	-.001
	Sig. (2-tailed)	.	.992
	N	57	55
Hypothesis #10		SPECIAL	ATTITUDE
SPECIAL	Pearson Correlation	1	.176
	Sig. (2-tailed)	.	.195
	N	58	56
Hypothesis #11		TYPE	ATTITUDE
TYPE	Pearson Correlation	1	.127
	Sig. (2-tailed)	.	.357
	N	57	55
Hypothesis #12		HOURS	ATTITUDE
HOURS	Pearson Correlation	1	.272
	Sig. (2-tailed)	.	.042
	N	58	56

Upon further review, there was no significant correlation in how many hours a dietitian would need to work to have a positive attitude when working with people with diabetes.   This may be due to the limited number of dietitians working more than 17 hours per week with people with diabetes.

CHAPTER V

Expectations, Conclusion, Recommendations

Expectations

With an estimated 160,000 West Virginians with diabetes, it would be anticipated that clinical dietitians would spend at least 25% of their time (10 hours) working with people with diabetes. The knowledge questions for this survey were taken from <u>The CORE Curriculum</u> and are similar to questions found on the certification exam for diabetes educators. Therefore, an overall mean knowledge score of 17 (75%) or higher would be expected to become certified. The anticipated mean score for medical nutrition therapy, chronic complications, macrovascular disease and lifestyle for diabetes prevention would be 3.75 (75%). A mean score of 2.25 (75%) would be expected for the knowledge subscale pathophysiology.

Dietitians would have better mean scores for questions regarding medical nutrition therapy and lifestyle for diabetes prevention than for questions regarding chronic complications, macrovascular disease, and pathophysiology. Dietitians with CDE credentials would have a higher mean score for the knowledge and attitude questions than non-CDE dietitians.

The Diabetes Attitude Scale was calculated on a response of 1=strongly disagree, 2=disagree, 3=neutral, 4=agree and 5=strongly agree. A minimum mean score of 4 (agree) would be anticipated from the dietitians with a higher mean score from CDEs.

Conclusions

This study surveyed 179 dietitians residing in West Virginia. The three-part survey assessed the dietitian's knowledge and attitude regarding diabetes care as well as provided demographic information identifying the dietitian's length and type of practice, route to registration, and specialty credentials. Of the 179 dietitians surveyed, 58 respondents' surveys were analyzed for this study.

The majority of the dietitians responding to the survey have been dietitians for 16 years or more (62.1%) and obtained their registration from an internship (39.7%) or master's degree program (29.3%). Only 5 dietitians (8.6%) in this survey had the CDE credentials. Twenty-one dietitians (36.2%) stated they worked 8 hours per week or more with people with diabetes while 31 dietitians (53.4%) worked as clinical (inpatient and outpatient) dietitians. The difference (n=10) may be due to these dietitians working in other specialty areas such as renal dialysis or nutritional support.

In December 2000, dietitians were identified as certified providers of Medicare benefits for patients with diabetes. These benefits state "RDs and nutritionists would use nationally recognized protocols, such as those developed by the American Dietetic Association". (Quick guide to the Medicare medical nutrition therapy (MNT) benefit, 2002) The ADA Scope of Practice includes medical nutrition therapy, interventions for diabetes prevention, pathophysiology, exercise, medication, glucose monitoring, and hypo/hyperglycemia management as issues the dietitian is qualified to discuss with the person with diabetes.

The original knowledge component of the survey incorporated these diabetes topics, however the pilot test committee felt these topics were not appropriate for the dietitian's scope of diabetes knowledge. The revised knowledge component included pathophysiology, chronic complications of diabetes, and macrovascular disease as well as medical nutrition therapy and lifestyle for diabetes prevention.

The overall knowledge mean score of the dietitians was 12.6379 ± 3.37534 (63.2% correct). As anticipated, the dietitians were more knowledgeable in the areas of medical nutrition therapy (68.3% correct) and lifestyle for diabetes prevention (58.3% correct). The overall knowledge mean score and the knowledge subscale mean scores were less than anticipated. Dietitians with the CDE credentials did, however, obtain higher mean scores than non-CDE dietitians.

The number of hours working with people with diabetes was expected to have an effect on the knowledge level of the dietitian. This was not found to be true. There were no other demographic factors having an effect on the mean knowledge score.

Dietitians' attitudes were very positive (>4.0) in all subscales with the lowest mean score of $4.1264 \pm .46549$ in the area of psychosocial impact of diabetes.   The need for special training had the highest mean score of $4.6552 \pm .32830$. These scores are consistent with studies completed by Anderson et al using the DAS-3. (Anderson, 1998)

<u>Recommendations</u>

Based on this study, it appears West Virginia dietitians do spend 25% of their time working with people with diabetes. They do, however, have a need to improve their knowledge of diabetes care to provide quality diabetes care as specified by Medicare.

West Virginia dietitians have a strong positive attitude regarding diabetes care. They feel especially strong about the need for special training to provide quality diabetes care.

Therefore the following recommendations have been generated:

1. Repeat this study and utilize the topics of medical nutrition therapy, lifestyle for diabetes prevention, pathophysiology, exercise, medication, glucose monitoring, and hypo/hyperglycemia management to determine the dietitians' knowledge of diabetes based on Medicare requirements for reinbursement.
2. Provide continuing education programs to update dietitians' knowledge of diabetes care and Medicare guidelines.
3. Encourage networking between Certified Diabetes Educators and Registered Dietitians at the local, state, regional, and national levels.

4. Encourage West Virginia dietitians to obtain certification in diabetes education.

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Appendices

Appendix A WVDA Correspondence

MARIE,
I can't email off of the WVDA laptop but I can either send you a list or send you a set of labels. The list is free, the labels are $35 for members. Let me know.
Becky

Marie,

WVDA distributes mailing lists. We just had the discussion about the cost at the last WVDA meeting and I don't remember the decision! There may not be a charge for members. Check with Becky Foster at rlfunited@aol.com or call her at 304-624-2273.

Linda

----- Original Message -----

From: Marie Gravely

To: St. Clair, Linda

Sent: Monday, February 11, 2002 8:59 PM

Subject: WVDA Mailing List

Hi Linda--

   As you may know, I am working on my thesis, "The Dietitian's Knowledge and Attitude of Diabetes Education". I would like to survey the West Virginia dietitians.

   Does the WVDA sell/distribute the mailing list for such a purpose or do I need to contact ADA? Any help you can give me would be greatly appreciated.

Marie Gravely

Appendix B Pre-piloted Survey Instrument

Knowledge

Read each item carefully. Fill the corresponding letter on the Scantron form. (Use #2 pencil.)

1. Basal profiles usually are not adjusted to reflect:
    a. Decreased nocturnal insulin needs
    b. Increased early morning insulin resistance
    c. Mealtime insulin needs
    d. Exercise adjustments

2. Hypoglycemia can be defined as any blood glucose level of:
    a. 85 mg/dL or lower
    b. 80 mg/dL or lower
    c. 75 mg/dL or lower
    d. 70 mg/dL or lower

3. What is the maximum age-adjusted heart rate would provide an optimum aerobic workout for CN?
    a. 50% to 70%
    b. 55% to 75%
    c. 60% to 85%
    d. 65% to 90%

4. Surgical patients with type 2 diabetes who are taking anitdiabetes agents:
    a. Will not need insulin before surgery
    b. Will need to take insulin after surgery as a permanent replacement of their previous treatment
    c. Should be informed that they may need insulin before, during and immediately after their surgery
    d. Should not be told that their insulin may be adjusted during surgery because they may become fearful of giving others decision-making responsibility for insulin adjustment.

5. Which of the following persons with type 2 diabetes would most benefit from medical nutrition therapy (MNT)?
    a. 42-year-old female with a cholesterol of 205 mg/dL
    b. 51-year-old male with low-density lipoproteins (LDL) of 134 mg/dL
    c. 36-year-old female with triglycerides of 150 mg/dL
    d. 60-year-old male with high-density lipoproteins (HDL) of 50 mg/dL

6. Which of the following statements about combination therapy is most accurate?
   a. Addition of TZD to existing therapy produces a therapeutic response within a week
   b. Combination therapy improves glycemic control in persons with type 1 diabetes
   c. When oral agents are combined, the medication should be taken 1 hour before meals
   d. Individuals starting combination therapy will need to monitor post-prandial blood glucose levels.

7. The most acutely dangerous complication of sulfonylurea therapy is:
   a. Weight gain
   b. Skin rashes
   c. Gastrointestinal disturbance
   d. Hypoglycemia

8. What is a decision concerning diabetes control that can be made from a single blood glucose reading?
   a. Adjustment of a patient's split insulin regimen
   b. Treatment of a blood glucose reading less than 70mg/dL
   c. Understanding the impact of a daily walking program
   d. Adjustment of meal plan

9. Which of the following statements is true?
   a. Pump therapy makes diabetes less noticeable
   b. Pump therapy involves an accelerated learning curve
   c. Pump wearers are discouraged from participating in active sports
   d. Insulin pump therapy is appropriate for all type 1 patients

10. Consumption of coffee may:
    a. Be a first aid treatment for hypoglycemia
    b. Increase autonomic symptoms
    c. Enhance neuroglycopenia
    d. Interfere with gluconeogenesis

11. Which exercise routine is most appropriate for an elderly patient with a degenerative joint disease?
    a. No exercise at all
    b. Aerobic exercise only
    c. Anaerobic exercise only
    d. Alternating aerobic and strength training exercise

12. Cardiac problems can be serious, even fatal, in a person with diabetes and should be assessed prior to surgery. During surgery, which of the following could occur?
    a. Anesthesia agents could stimulate heart muscle function
    b. Hyperglycemia could cause excessive bleeding
    c. Patients risk hypotension, hypovolemia, and rhythm disturbances
    d. Metabolic stresses cause carotid bruits to develop

13. Which of the following intakes of the sugar substitute aspartame on a daily basis exceeds the acceptable daily intake (ADI) for a female who weighs 130 lbs?
    a. 14 cans (12 oz.) of diet soft drink
    b. 18 cans (12 oz.) of diet soft drink
    c. 45 packets of a tabletop sweetener
    d. 75 packets of a tabletop sweetener

14. One reason sliding scale insulin administration is less desirable as a pattern management approach is:
    a. It is based on patient's current weight
    b. It varies according to patient's food intake
    c. It may contribute to rapid shifts in glucose levels
    d. It may confuse patients trying to remember amount of insulin to administer

15. G.W., a 70-year-old patient with type 2 diabetes, has a blood creatinine level of 3.0 mg/dL. Which of the following drugs is contraindicated for G.W.?
    a.   Pioglitazone
    b. Glipizide
    c. Glyburide
    d. Metformin

16. An effective approach for teaching patients how to use a blood glucose meter is:
    a. Show how to calibrate the meter before demonstrating its use
    b. Change your gloves every hour
    c. Evaluate the patient's technique whenever hyperglycemia occurs
    d. Teach the patient how to check the blood glucose before teaching meter cleaning and record keeping.

17. The DCCT demonstrated that tighter control of diabetes with insulin pump therapy was associated with all of the following except:
    a.   Decreased weight
    b.   Decreased nephropathy
    c.   Decreased retinopathy
    d.   Increased patient satisfaction

18. When a patient with type 1 diabetes of 10 years suddenly begins trembling, shaking and experiencing other symptoms indicating hypoglycemic reaction, the body responds by releasing:
    a. Acetylcholine
    b. Epinephrine
    c. Hydrocortisone
    d. Glucagon

19. What frequency of exercise is optimal for weight loss for CN?
    a. 2 to 3 days/week
    b. 3 to 4 days/week
    c. 4 to 5 days/week
    d. 5 to 7 days/week

20. Which guideline is important during postoperative care?
    a. Meticulous wound care
    b. Frequent monitoring of blood glucose
    c. Adequate pain management
    d. All of the above are important

21. Assuming that blood glucose goals are being met, the guidelines for the use of alcohol in persons with diabetes include all of the following except:
    a. Teach adult men with diabetes to limit consumption to 2 drinks with their regular meal plan
    b. Eliminate one or more carbohydrate serving for each alcoholic beverage consumed
    c. A 12-oz beer, 5-oz wine, or 1 ½ oz hard liquor (spirits) is considered 1 drink
    d. Avoid consumption of alcoholic beverages if triglycerides are elevated

22. Pattern management of blood glucose levels involves reviewing:
    a. Several days of glucose records and making changes in the diabetes management program when a problem persists
    b. Sporadic glucose records and making corrections in the diabetes management program after problems have occurred
    c. Glycysolated hemoglobin values and making adjustments in diabetes management before the onset of long-term complications
    d. Fasting serum glucose values and making modifications in diabetes management before a problem surfaces

23. Insulin exerts all of the following effect on the body tissues except:
    a. Stimulate entry of glucose into muscle cells for utilization as an energy source
    b. Enhance fat storage
    c. Promote breakdown of liver glycogen to maintain blood glucose levels
    d. Stimulate entry of amino acids into cells enhancing protein biosynthesis

Attitudes

Below are some statements about diabetes. Each numbered statement finishes the sentence "In general, I believe that..." You may believe that a statement is true for one person but not for another person or may be true one time but not be true another time. Mark the answer on the Scantron form that you believe is true most of the time or is true for most people. It is important that you answer every statement.

Note: The term "health care professionals" in this survey refers to doctors, nurses, and dietitians.

In general, I believe that:	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
24. ...health care professionals who treat people with diabetes should be trained to communicate well with their patients.	a	b	c	d	e
25. ...people who do not need to take insulin to treat their diabetes have a pretty mild disease.	a	b	c	d	e
26. ...there is not much use in trying to have good blood sugar control because the complications of diabetes will happen anyway.	a	b	c	d	e
27. ...diabetes affects almost every part of a diabetic person's life.	a	b	c	d	e
28. ...the important decisions regarding daily diabetes care should be made by the person with diabetes.	a	b	c	d	e
29. ...health care professionals should be taught how daily diabetes care affects patients' lives.	a	b	c	d	e

In general, I believe that:	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
30. ...older people with Type 2* diabetes do not usually get complications.	a	b	c	d	e
31. ...keeping the blood sugar close to normal can help to prevent the complications of diabetes.	a	b	c	d	e
32. ...health care professionals should help patients make informed choices about their care plans.	a	b	c	d	e
33. ...it is important for the nurses and dietitians who teach people with diabetes to learn counseling skills.	a	b	c	d	e
34. ...people whose diabetes is treated by just a diet do not have to worry about getting many long-term complications.	a	b	c	d	e
35. ...almost everyone with diabetes should do whatever it takes to keep their blood sugar close to normal.	a	b	c	d	e
36. ...the emotional effects of diabetes are pretty small.	a	b	c	d	e

**Type 2 diabetes usually begins after age 40. Many patients are overweight and weight loss is often an important part
of the treatment. Insulin and/or diabetes pills are sometimes used in the treatment. Type 2 diabetes is also called noninsulin-dependent diabetes mellitus or NIDDM; formerly it was called "adult diabetes."

In general, I believe that:	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
37. ...people with diabetes should have the final say in setting their blood glucose goals.	a	b	c	d	e
38. ...blood sugar testing is not needed for people with Type 2* diabetes.	a	b	c	d	e
39. ...low blood sugar reactions make tight control too risky for most people.	a	b	c	d	e
40. ...health care professionals should learn how to set goals with patients, not just tell them what to do.	a	b	c	d	e
41. ...diabetes is hard because you never get a break from it.	a	b	c	d	e
42. ...the person with diabetes is the most important member of the diabetes care team.	a	b	c	d	e
43. ...to do a good job, diabetes educators should learn a lot about being teachers	a	b	c	d	e
44. ...Type 2* diabetes is a very serious disease.	a	b	c	d	e
45. ...having diabetes changes a person's outlook on life.	a	b	c	d	e

* Type 2 diabetes usually begins after age 40. Many patients are overweight and weight loss is often an important part of the treatment. Insulin and/or diabetes pills are sometimes used in the treatment. Type 2 diabetes is also called noninsulin-dependent diabetes mellitus or NIDDM; formerly it was called "adult diabetes."

In general, I believe that:	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
46. ...people who have Type 2* diabetes will probably not get much payoff from tight control of their blood sugars.	a	b	c	d	e
47. ...people with diabetes should learn a lot about the disease so that they can be in charge of their own diabetes care.	a	b	c	d	e
48. ...Type 2* is as serious as Type 1† diabetes.	a	b	c	d	e
49. ...tight control is too much work.	a	b	c	d	e
50. ...what the patient does has more effect on the outcome of diabetes care than anything a health professional does.	a	b	c	d	e
51. ...tight control of blood sugar makes sense only for people with Type 1† diabetes.	a	b	c	d	e

* Type 2 diabetes usually begins after age 40. Many patients are overweight and weight loss is often an important part of the treatment. Insulin and/or diabetes pills are sometimes used in the treatment. Type 2 diabetes is also called noninsulin-dependent diabetes mellitus or NIDDM; formerly it was called "adult diabetes."

†Type 1 diabetes usually begins before age 40 and always requires insulin as part of the treatment. Patients are usually not overweight. Type 1 diabetes is also called insulin-dependent diabetes mellitus or IDDM; formerly it was called "juvenile diabetes."

In general, I believe that:	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
52. ...it is frustrating for people with diabetes to take care of their disease.	a	b	c	d	e
53. ...people with diabetes have a right to decide how hard they will work to control their blood sugar.	a	b	c	d	e
54. ...people who take diabetes pills should be as concerned about their blood sugar as people who take insulin.	a	b	c	d	e
55. ...people with diabetes have the right <u>not</u> to take good care of their diabetes.	a	b	c	d	e
56. ...support from family and friends is important in dealing with diabetes.	a	b	c	d	e

Demographics

Read each item carefully. Fill the corresponding letter on the Scantron.
(Use #2 pencil.)

57. Number of years as a registered dietitian
    a. 0-5 years
    b. 6-10 years
    c. 11-15 years
    d. 16-20 years
    e. 21 years +

58. Route to registration
    a. traineeship
    b. internship
    c. CUP program
    d. Masters + 6 months

59. Specialty credentials
    a. none
    b. CDE
    c. Renal specialist
    d. Pediatric specialist
    e. Nutrition support specialist

60. Type of dietetic practice
    a. management
    b. academia
    c. public health
    d. inpatient clinical
    e. outpatient clinical

61.Work schedule
    a. Full time (35 + hours/week)
    b. Part time (less than 35 hours/week)
    c. Not currently employed
    d. Retired

62. Number of hours working with diabetes
    a. less than 8 hours per week
    b. 8-16 hours per week
    c. 17-24 hours per week
    d. 25-32 hours per week
    e. 33-40 hours per week

The Michigan Diabetes Research and Training Center (MDRTC) has developed several survey instruments for diabetes patients and health professionals. Below are summaries of the available instruments. If you would like to download any of these instruments, click on the download button. Once you click on the download button you will be asked to register and fill out a form requesting information on how you plan to use the instrument. By submitting the form you also are agreeing to acknowledge the MDRTC as the source of the items in the survey instruments in any written instruments, reports, or publications resulting from their use or reproduction. These materials are available for download as Word documents.

Diabetes Attitude Scale (DAS-3)

A scale that can be used with both people with diabetes and health care professionals as a measure of general diabetes related attitudes. Information about the scoring and psychometric properties of this scale is also available here.

Appendix D Approval for Randomizer

This web site is designed to assist researchers and students who want an easy way to perform random sampling or assign participants to experimental conditions. Research Randomizer can be used in a wide variety of situations, including psychological experimentation, medical trials, and survey research. The program uses a JavaScript random number generator to produce customized sets of random numbers. The current version, v2.1, improves on previous versions of RR by adding faster sorting capabilities as well as the ability to sort numbers from greatest to least, if preferred.

Appendix E Final Survey instrument

Knowledge

Read each item carefully. Fill the corresponding letter on the Scantron form. (Use #2 pencil.)

1. An effective strategy for achieving blood glucose goals in a person with type 1 diabetes is:
    a. Moderate caloric restriction
    b. Eating meals and snacks at specific times
    c. Increasing NPH insulin if carbohydrate intake exceeds usual consumption
    d. Integrating insulin regimen into usual eating habits
    e. Don't know

2. Which of the following statements best describes the role of hyperglycemia in the development of complications of diabetes?
    a. There is strong evidence that control of hyperglycemia will result in a decrease in cardiovascular events
    b. Improved glycemic control has a marginal impact, if any, on the total cholesterol levels, platelet adherence factors, and LDL cholesterol
    c. Elevated blood glucose levels can interfere with nerve membrane functioning and nerve transport
    d. Hyperglycemia leads to suppression of the polyol pathway and the formation of advanced glycosylated end products (AGE)
    e. Don't know

3. What impact does diabetes have on the development of coronary artery disease in women compared with men?
    a. Women have a higher risk than men
    b. Men have a higher risk than women
    c. The risk is minimal in both sexes
    d. The risk is the same for both sexes
    e. Don't know

4. Factors that are useful in better understanding cultural and familial influences on lifestyle behaviors include:
    a. Medical history of the individual
    b. The individual's feelings about weight loss, access to transportation, and available monetary resources
    c. Notes about the patient's compliance written in the clinic medical chart by the primary care provider
    d. Experiences of other similar patients
    e. Don't know

5. Glycogenolysis is the metabolic conversion of
    a. Glycogen into glucose
    b. Glucagons into glucose
    c. Glucose into glycogen
    d. Glucose into glucagons
    e. Don't know

6. Which of the following MNT strategies is consistent with the goal of attaining optimal lipid levels?
   a. Limit fat consumption to 20% of daily calories in a person with normal lipids levels
   b. Restrict dietary cholesterol to less than 200 mg/day if triglycerides are elevated
   c. Limit saturated fatty acids to less than 10% of daily calories if LDL cholesterol is the primary concern
   d. Increase polyunsaturated fat to 15% of total fat calories if VLDL levels are a primary concern
   e. Don't know

7. Which of the following increase the risk of diabetic nephropathy?
   a. Hyperglycemia
   b. Hypertension
   c. Hypercholesterolemia
   d. All of the above
   e. Don't know

8. The elements that commonly characterize the metabolic syndrome are:
   a. Hyperglycemia, central obesity, neuropathy, and microalbuminuria
   b. Hyperglycemia, hyperlipidemia, hypertension, and central obesity
   c. Hyperlipidemia, hypertension, and family history of cardiovascular disease
   d. Hypoglycemia, neuropathy, hyperinsulinemia, and pregnancy
   e. Don't know

9. Moderate physical activity is equivalent to:
   a. Walking at 3 to 4 miles per hour
   b. Walking a mile in 15 to 20 minutes
   c. Brisk walking
   d. All of the above
   e. Don't know

10. If Mrs. M.L. eats a meal that includes 1 serving from the starch group, 1 serving of meat (1 oz.), 1 serving of fruit (1/2 c.), and 1 serving of milk (8 oz.), what will be her intake of protein?
    a. 10 grams
    b. 14 grams
    c. 18 grams
    d. 20 grams
    e. Don't know

11. Which of the following is the most costly complication of diabetes?
    a. Retinopathy
    b. Cardiovascular disease
    c. Nephropathy
    d. Neuropathy
    e. Don't know

12. Which of the following statements is the least accurate about peripheral vascular disease (PVD)?
    a. Absent peripheral pulses occur with approximately the same frequency in persons with type 1 and type 2 diabetes
    b. Patient education efforts should emphasize foot care
    c. People with diabetes have a 15 times higher age-related risk for amputation
    d. PVD is clinically characterized by intermittent claudication and foot ulcers
    e. Don't know

13. How frequently should you engage in moderate physical activity for weight loss?
    a. Three times per week
    b. Every other day
    c. Daily
    d. Five times per week
    e. Don't know

14. People who do not have diabetes can have impaired fasting blood glucose values. One example of this is:
    a. A school-aged child with FBSs of 86 and 89 mg/dL
    b. An active teenager with FBSs of 101 and 103 mg/dL
    c. An employed adult with FBSs of 122 and 125 mg/dl
    d. An elderly adult with FBSs of 140 and 142 mg/dl
    e. Don't know

15. Insulin affects the use and storage of nutrients in each of the following ways except:
    a. Facilitates cellular transport
    b. Promotes lipogenesis by inactivating lipoprotein lipase
    c. Stimulates glycogen synthesis
    d. Suppresses gluconeogenesis (glucose production by the liver)
    e. Don't know

16. In addition to the nonmodifiable risk factors of duration of diabetes, race, genetics, and age, for which of the following complications of diabetes has height and autoimmunity been shown to be a factor?
    a. Cardiovascular complications
    b. Neuropathies
    c. Nephropathies
    d. Retinopathies
    e. Don't know

17. Improved glycemic control does which of the following?
    a. Decrease triglyceride and increases HDL
    b. Increases plasma fibrinogen levels
    c. Increase HDL levels independent of changes in lipid levels
    d Has little effect on platelet behavior
    f. Don't know

18. The recommended rate of weight loss is:
    a. 2 or more pounds per week
    b. Variable depending on the individual
    c. No more than ½ pound per week
    d. 1 to 2 pounds per week
    e. Don't know

19. Which of the following individuals would be diagnosed with diabetes mellitus using the present criteria on a subsequent day:
    a. A 44-year-old woman with unexplained weight loss, fatigue, and casual plasma glucose concentrations of 180 mg/dL and 170 mg/dL
    b. A 50-year-old asymptomatic male with a fasting plasma glucose of 138 mg/dL and 146 mg/dL
    c. A 28-year-old male with a 2-hour plasma glucose (OGTT) of 160 mg/dL and 140 mg/dL
    d. A 60-year-old female with causal plasma glucose concentration of 145 mg/dL and 130 mg/dL
    e. Don't know

20. Assuming that the blood glucose goals are being met, the guidelines for the use of alcohol in persons with diabetes include all of the following except:
    a. Teach adult men with diabetes to limit consumption to 2 drinks with their regular meal plan
    b. Eliminate 1 or more carbohydrate servings for each alcoholic beverage consumed
    c. A 12-oz beer, 5-oz wine, or 1 ½ -oz of hard liquor (spirits) is considered 1 drink
    d. Avoid consumption of alcoholic beverages if triglycerides are elevated
    e. Don't know

21. The need for laser therapy for diabetic retinopathy has only a small increase after how many years duration of diabetes:
    a. 5 years
    b. 10 years
    c. 17 years
    d. 22 years
    e. Don't know

22. In the development of cardiovascular disease, smoking is associated with:
    a. Elevated HDL levels
    b. Decreased fibrinogen levels
    c. Development of advanced glycosylated end products (AGEs)
    d. Formation of stable plaques with a thick fibrous cap
    e. Don't know

23. Pharmacologic agents to support weight loss efforts can be considered after:
    a. 6 weeks of behavioral therapy
    b. 6 months of behavioral therapy
    c. Never (none have been shown to be effective)
    d. None of the above
    e. Don't know

Attitudes

Below are some statements about diabetes. Each numbered statement finishes the sentence "In general, I believe that..." You may believe that a statement is true for one person but not for another person or may be true one time but not be true another time. Mark the answer on the Scantron form that you believe is true most of the time or is true for most people. It is important that you answer _every_ statement.

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* Type 2 diabetes usually begins after age 40. Many patients are overweight and weight loss is often an important part of the treatment. Insulin and/or diabetes pills are sometimes used in the treatment. Type 2 diabetes is also called noninsulin-dependent diabetes mellitus or NIDDM; formerly it was called "adult diabetes."

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* Type 2 diabetes usually begins after age 40. Many patients are overweight and weight loss is often an important part of the treatment. Insulin and/or diabetes pills are sometimes used in the treatment. Type 2 diabetes is also called noninsulin-dependent diabetes mellitus or NIDDM; formerly it was called "adult diabetes."

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56. ...support from family and friends is important in dealing with diabetes.	a	b	c	d	e

Demographics

Read each item carefully. Fill the corresponding letter on the Scantron.
(Use #2 pencil.)

57. Number of years as a registered dietitian
    a.   0-5 years
    b.   6-10 years
    c.   11-15 years
    d.   16-20 years
    e.   21years +

58. Route to registration
    a.   traineeship
    b.   internship
    c.   CUP program
    d.   Masters + 6 months

59. Specialty credentials
    a.   none
    b.   CDE
    c.   Renal specialist
    d.   Pediatric specialist
    e.   Nutrition support specialist

60. Type of dietetic practice
    a.   management
    b.   academia
    c.   public health
    d.   inpatient clinical
    e.   outpatient clinical

61.Work schedule
    a.   Full time (35 + hours/week)
    b.   Part time (less than 35 hours/week)
    c.   Not currently employed
    d.   Retired

62. Number of hours working with diabetes
    a.   less than 8 hours per week
    b.   8-16 hours per week
    c.   17-24 hours per week
    d.   25-32 hours per week
    e.   33-40 hours per week

Appendix F Introductory Letter

Dietitian   May 28, 2002
Dietitian's Address
City, State, Zip Code

Dear *Dietitian*:

Registered dietitians throughout the state of West Virginia share the concern for people with diabetes to receive appropriate care and education. As a registered dietitian and a graduate student at Marshall University, I am researching the knowledge and attitude of West Virginia's registered dietitians toward diabetes management.

West Virginia's 2000 Diabetes prevalence rate of 7.6% is the second highest in the 52 states and territories in the Center for Disease Control and Prevention's Behavioral Risk Factor Surveillance System (BRFSS). This is cause for concern since:

- The risk of heart disease and stroke is two to four times greater among persons with diabetes. Heart disease is the leading cause of diabetes-related deaths.
- Diabetes is the leading cause of new blindness in adults 20 to 74 years of age.
- Diabetes is the leading cause of end-stage renal disease.
- Diabetes is responsible for more than half of all lower limb amputations.

Diabetes education including Medical Nutrition Therapy is a key to good diabetes control. The dietitian has an important role in providing current and applicable information to the person with diabetes.

I would appreciate your time in completing the enclosed questionnaire. The 62-item questionnaire will assess the knowledge and attitudes of registered dietitians towards diabetes management. It is estimated the questionnaire will take 15 minutes to complete.

The results of this questionnaire may be presented at the American Association of Diabetes Educators annual meeting in 2003. I will also be willing to present the findings at the West Virginia Dietetic Association Spring Meeting in 2003.

Please return the completed Scantron form in the enclosed stamped self-addressed envelope by June 11, 2002. Thank you for your assistance in this research project.

Sincerely,

Marie R. Gravely, RD, CDE   Susan C. Linnenkohl, PhD, RD
Graduate Student in FCS   Professor in FCS

Appendix G Thank you/Reminder Postcard

Thank You

A couple of weeks ago, you received a questionnaire on diabetes management. Thank you for taking the time to complete it and returning it to me.

If you have not completed it, could you please take a few minutes to do so. Your input is important in the analysis of the results. We hope to have all questionnaires returned by June 18, 2002. Thank you in advance for your contribution to this research.

Marie Gravely, RD, CDE

Marshall University Graduate Student

Appendix H DAS-3 Method of Analysis

Scale Name	Scale Equation	Special Instructions
Need for Special Training	(Q 24, Q29, Q33, Q40, Q43) / Number of non-missing items	
Seriousness of NIDDM	(Q25, Q30, Q34, Q38, Q44, Q48, Q54) / Number of non-missing items	Reverse scores for Q25, Q30, Q34, and Q38.
Value of Tight Control	(Q26, Q31, Q 35, Q39, Q46, Q49, Q51) /Number of non-missing items	Reverse scores for Q26, Q39, Q46, Q49, and Q51.
Psychosocial Impact of DM	(Q27, Q36, Q41, Q45, Q52, Q55) / Number of non-missing items	Reverse scores for Q36.
Patient Autonomy	(Q28, Q32, Q37, Q42, Q47, Q50, Q53, Q56) / Number of non-missing items	

Note: Strongly Agree = 5, Agree = 4, Neutral = 3, Disagree = 2 and Strongly Disagree = 1

Note: If 50% of the items of a scale are missing, the scale should be considered as missing.