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**TENNESSEE DIETITIANS' COUNSELING PRACTICES
REGARDING THE ROLE OF EXERCISE IN THE
MANAGEMENT OF NON-INSULIN-DEPENDENT
DIABETES MELLITUS**

A Dissertation
Presented for the
Doctor of Philosophy
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Janice Lee Kidd
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To REW

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ABSTRACT

This study surveyed a random sample of 286 dietetic practitioners from the Tennessee Dietetic Association's mailing list and obtained an 86% response rate. Forty percent ($n = 98$) of the 246 respondents reported that they counseled clients with non-insulin-dependent diabetes mellitus (NIDDM) and were classified as "counselors."

"Noncounselors" comprised the remainder of the sample.

Ninety-four percent of the counselors indicated that they provided exercise information to some or all of their clients with NIDDM, with a mean monthly caseload of 11 clients. The percentage of time spent discussing exercise in initial counseling sessions (TSS1) was 14, and the percentage in follow-up counseling sessions (TSS2) was 19. Counselors *usually* or *always* discussed an average of 10 of 16 exercise-related topics during initial counseling sessions.

Over 80% of the respondents identified 3 *very important* reasons to include information about exercise: exercise is important in managing diabetes; exercise decreases risk factors for other complications of diabetes; and client requires weight loss. Only 1% of the respondents identified a "belief that information about exercise is NOT important" and 9% a "belief that it is NOT appropriate for a dietitian to discuss exercise" as *very important* reasons to exclude exercise information.

Knowledgeable respondents answered correctly 16 or more of 22 questions about exercise and its role in diabetes management. Sixty-two percent of counselors and 61% of noncounselors were considered knowledgeable. There was a statistically significant difference ($\alpha = .05$) in the means of the TSS1 scores of the 2 groups of counselors; counselors categorized as not knowledgeable spent a greater percentage of time in the initial counseling session discussing exercise-related topics.

Ten personal health promotion activities were assessed. Seventy-six percent of all respondents participated in 7 or more of these practices in an "ideal" manner, with a mean of 8 activities. The majority of Tennessee dietetic practitioners did set a good example for their clients in health promotion practices, though there was room for improvement, particularly by decreasing body weight and increasing exercise.

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CHAPTER 1

INTRODUCTION

Diabetes mellitus is a disease diagnosed in 5.8 million people in America. An additional 4-5 million Americans are estimated to have the disease, but are not yet diagnosed. Non-insulin-dependent (NIDDM) or Type II diabetes accounts for about 90-95% of the cases. Food, insulin, and exercise have been recognized as the cornerstones of the treatment of this disease for almost 70 years.

Dietitians in both clinical and community settings counsel persons with diabetes regularly on the role of dietary intake in achieving normal blood glucose and optimal lipid levels. The dietitians' role in providing this information is unchallenged. However, there is clear lack of direction on whom, if anyone, provides information to the person with diabetes about the role of exercise in controlling blood glucose levels and decreasing risk factors for other medical conditions. With the emphasis on health promotion and preventive medicine in the United States today, many dietitians have been vocal about the need for members of the profession to incorporate information about exercise and physical activity in their counseling sessions. Alice Smitherman, a past president of the American Dietetic Association has said: "With the right tools and education, dietitians should be about the business of teaching exercise" (1). However, there is little if any information about the extent to which dietitians are actually counseling clients in the area of exercise or physical activity.

With this background, this study was designed to ascertain some of the counseling practices of Tennessee dietitians who work with individuals with non-insulin-dependent diabetes mellitus (NIDDM). A survey was conducted of a random sample of 286 dietitians from the Tennessee Dietetic Association mailing list. The respondents were asked a variety of questions in 4 major categories: counseling practices, health promotion activities, knowledge about the role of exercise in diabetes mellitus, and demographic information.

A major purpose of survey research is to describe some event, person, or condition. Several pertinent questions regarding the nature of the dietitians' counseling practices are identified below. These questions were answered by the results of this study, which are described in detail in Chapter 4 of this dissertation. Figure 1:1 lists the operational definitions used in these questions and in the following hypotheses.

1. How many Tennessee dietitians (who counsel clients with NIDDM) discuss the role of exercise in the management of diabetes?
2. How frequently do Tennessee dietitians counsel clients with NIDDM about the role of exercise in the management of diabetes?
3. How much time do Tennessee dietitians spend counseling clients with NIDDM about the role of exercise in the management of diabetes?
4. What topics related to the role of exercise in diabetes management do Tennessee dietitians include most frequently when counseling clients with NIDDM?
5. What reasons for providing counseling are cited most frequently by Tennessee dietitians who counsel clients with NIDDM about the role of exercise?
6. What reasons are cited most frequently by Tennessee dietitians for *not* providing counseling about the role of exercise in the management of NIDDM?

1. **Exercise Counseling Practices** are defined by 2 measures: (1) the frequency with which exercise is discussed with individuals with NIDDM and (2) the percentage of time in the counseling session spent discussing exercise in both the initial and follow-up sessions.
2. **Knowledgeable** is defined as the ability to answer correctly 16 or more of the 22 questions on the survey instrument about the importance of exercise and the role of exercise in diabetes as it relates to insulin requirement and dietary intake.
3. **Regular aerobic exercise** is defined as the self-reported participation in an aerobic activity three or more times per week for 21 or more minutes per period.
4. **Selected demographic (independent) variables** are identified as:
 - age of dietitian
 - years in practice
 - level of education (or degree)
 - amount of self-reported formalized education in Physical Education or Exercise Physiology
 - number of clients with NIDDM counseled per month
 - work setting
 - primary setting for counseling
 - recency of education
 - dietitian's diagnosis of diabetes mellitus

FIGURE 1-1

Operational definitions

7. Can Tennessee dietitians be considered knowledgeable (see definition in Figure 1-1) about the role of exercise in diabetes management?

In addition to the descriptive nature of this survey project, the study was also designed to test hypotheses about the relationships between dietitians' exercise counseling practices of people with NIDDM and other variables such as knowledge (about the role of exercise in diabetes management) and personal health promotion practices. The original hypotheses are identified in the following paragraphs.

- 1. Tennessee dietitians who are knowledgeable (see definition in Figure 1-1) about the role of exercise in diabetes management do not provide longer counseling sessions in this area than do dietitians who are not knowledgeable.**
- 2. Tennessee dietitians who are knowledgeable (see definition in Figure 1-1) about the role of exercise in diabetes management present no more topics of discussion related to exercise in counseling sessions than do dietitians who are less knowledgeable.**
- 3. Tennessee dietitians who counsel clients with NIDDM about the role of exercise in diabetes management participate in regular exercise no more frequently than do those dietitians who do not counsel on the role of exercise.**
- 4. Tennessee dietitians who counsel clients with NIDDM about the role of exercise in diabetes management participate in no more personal health promotion activities than do those dietitians who do not counsel on the role of exercise.**
- 5. There is no difference in whether or not Tennessee dietitians include exercise information (in counseling sessions for clients with NIDDM) based on selected demographic variables (see Figure 1-1 for list of variables).**

CHAPTER 2

REVIEW OF LITERATURE

A. Incidence of Diabetes Mellitus

Diabetes mellitus affects approximately 20-30 million people throughout the world, with 5.8 million or nearly 2.5% of Americans diagnosed with the disease (2). An additional 4-5 million people in the United States are estimated to have diabetes, but are not diagnosed (2). Drury et al.(3) reported that the largest share of adults with diabetes (54%) reside in the south, primarily in metropolitan areas. In Tennessee, there are approximately 138,000 diagnosed cases of diabetes and 100,000 more not yet diagnosed (4). In the Knoxville area, records from 1 local hospital showed 6% of their admissions as patients with a diagnosis of diabetes during the period January to September, 1987 (5). Another large Knoxville hospital discharged 1087 patients (or approximately 8%) who had a primary or secondary diagnosis of diabetes mellitus during the period January to August, 1987 (6).

Diabetes is recognized as the seventh underlying cause of death in the United States, accounting for almost 2% of the deaths in 1982 (7). About 75% of the death certificates listing diabetes as an underlying cause of death, also list a cardiovascular condition (7). Anderson (8) estimates that individuals with diabetes have a risk of heart disease and stroke that is 2-3 times greater than the general population. Diabetes is

particularly associated with death in older persons in the United States, with about 76% of diabetes-related deaths occurring at age 65 years and older (7).

Drury et al. (3) reported that adults with diabetes are very similar to the general United States adult population with respect to marital status and living arrangements, but are quite different with respect to age, sex, race, education, and family income. The median age of the United States population (20 years and older) is 42 years, while the median age of people with diabetes is 61 years. There are a smaller proportion of men and a higher proportion of blacks who have diabetes than in the general population. Adults with diabetes in general have completed fewer years of formal schooling than adults in general. Individuals with diabetes are also more likely than the general population to live in families with low annual incomes.

Diabetes mellitus is a disease which is comprised of a heterogeneous group of disorders characterized by high blood glucose levels (2). It is usually divided into 2 major categories: Type I or insulin-dependent diabetes mellitus (IDDM) and Type II or non-insulin-dependent diabetes mellitus (NIDDM). IDDM accounts for approximately 5-10% of all cases of diabetes in the United States (2), but rarely goes undiagnosed due to its specific symptoms and usually abrupt onset. The incidence of IDDM in the United States has remained stable since 1965 (9).

NIDDM comprises the remaining 90-95% of the cases of diabetes. Since the onset of Type II diabetes is usually gradual with rather mild symptoms, the number of undiagnosed cases of NIDDM is estimated to be nearly equal to the number of diagnosed cases (10). In the period 1935-1973, there was an increase in total incidence of NIDDM, but since then the incidence rates have remained stable or declined (11). The earlier rise in incidence may be attributed partially to more active screening for diabetes, gradual aging of the U.S. population (10), as well as the common increase in

body weight associated with aging. Everhart and associates (11) also cite increasing age, high blood glucose concentration, family history of diabetes, and obesity as the most important risk factors for developing NIDDM.

B. Cornerstones of Diabetes Mellitus Management

The discovery of insulin by Banting and Best in 1921 was a major turning point in diabetes management (10). It was at this time that food, insulin, and exercise became recognized as the cornerstones of the treatment of the disease, with E. P. Joslin as a major proponent (12). Though methods of using food, medication, and physical activity in diabetes treatment have changed dramatically in the past 50 years, they remain the basis for modern diabetes management.

Martin and Quint (13) provide estimates about Americans' use of insulin, oral hypoglycemic agents, and diet as modes of therapy in diabetes. Diet alone is the chosen therapy for 15% of the individuals with diabetes. Roughly 25% of patients use insulin, while 35% use oral hypoglycemic agents. While dietary modification is prescribed for practically all people with diabetes, only about three-fourths of the individuals with diabetes using medication also practice dietary modification. It is estimated that 25% of patients with diabetes do not use any of these 3 therapies. No information is provided on the use of exercise as a treatment modality. As the age of the individual with diabetes increases, there is a tendency for physicians to prescribe oral hypoglycemic agents more frequently than insulin for patients who require medication. Use of dietary therapy is approximately constant across age groups and there appears to be no difference in therapy by race or sex (13).

C. Management of Diabetes by Medication

1. Insulin

Galloway and Davidson (14) identify the goal of insulin therapy to "normalize plasma glucose levels while minimizing or avoiding the complications of insulin therapy." By definition, insulin therapy is required in all cases of IDDM and approximately 25% of patients with NIDDM require insulin as well. According to Galloway and Davidson (14), two-thirds of the insulin-dependent patients can be controlled by 1 dose of insulin daily, with most individuals requiring from 20-40 Units per day. Other physicians stress the need for tighter control of blood glucose levels than can be achieved with a single daily injection of insulin and recommend 2 or more doses, particularly for patients under the age of 65 years (15). Insulin can be grouped into 3 categories: short, intermediate, and long-acting. Table 2-1 identifies the types of insulin, the critical onset of action, and total duration of action of each.

Commonly, dosages of 2 types of insulin may be mixed together in the same syringe. Frequently an intermediate-acting and short-acting insulin, such as NPH and regular insulin are mixed and administered before breakfast. As seen from the information in Table 2-1, the regular insulin would then prevent hyperglycemia immediately after breakfast and would have some effect at the time of the lunch meal, while the NPH insulin's peak action would occur around the time of the evening meal (15).

2. Oral Hypoglycemic Agents

The use of oral hypoglycemic agents (OHAs) in the United States dates back to the early 1950s. Their use in the United States is limited to oral sulfonyl-urea

TABLE 2-1

Approximate time-activity relation of various insulin preparations

Type of insulin	Preparation	Onset of action	Maximal action	Total duration of action
		<i>h</i>	<i>h</i>	<i>h</i>
Short-acting:	Regular	0.5-1	2-4	4-6
	Semilente	1-2	3-6	8-12
Intermediate-acting:	NPH	3-4	10-16	20-24
	Lente	3-4	10-16	20-24
Long-acting:	PZI	6-8	14-20	>32
	Ultralente	6-8	14-20	>32

Source: Davidson, M.B. (1986) *Diabetes Mellitus: Diagnosis and Treatment*, 2nd ed.

medications (13). The mechanism by which they produce long-term lowering of blood glucose is not completely clear. Paradoxically, since the patient with NIDDM usually has adequate amounts of endogenous insulin, these drugs acutely stimulate pancreatic secretion of insulin. Simonson and co-workers (16) suggest that oral sulfonyl-urea medications' mechanism of action may be in a potentiation of peripheral insulin action and/or hepatic effects. These drugs are usually not effective during periods of stress, such as surgery or pregnancy.

Controversy about the safety of this class of drugs stems from the report of the University Group Diabetes Program (UGDP) multicenter oral agent trial (17). The questions raised were: 1) Is there an increase in cardiovascular mortality with the use of tolbutamide? and 2) How important is dietary intake as part of oral hypoglycemic agent therapy? The study (17) showed that dietary control was about as effective as oral agents over time in maintaining roughly the same control of blood glucose levels. Subsequent review and challenge of the UGDP trials (18,19) has led to continued use of the OHAs.

Recently a journal for diabetes related health professionals, the *Diabetes Spectrum*, devoted an entire issue to the unresolved problems of OHA usage. In the introduction to that issue, Yarborough and Steil (20) identified the illusion of "diabetes control in an easy-to-swallow tablet" as the major barrier to long-term success with these agents. Quite often neither the physician, patient, nor diabetes educator invests the necessary time or effort in patient education and motivation for life-style changes. Yarborough and Steil (21) summarized the most important concepts related to OHA usage discussed in that issue of *Diabetes Spectrum*:

1. Education programs for people with NIDDM need to be intensified and ongoing;

- 2 . Each practitioner can begin to use the results of self-monitoring of blood glucose and laboratory measurements in a consistently applied fashion to build a data base with which to improve the ability to predict OHA success or failure;
- 3 . Assessment and reassessment of OHA therapy must be emphasized, giving attention to all components of therapy, not just blood glucose values;
- 4 . OHAs alone are not the answer, diet and exercise are still mandatory components of diabetes care; and
- 5 . Differentiating the precise mechanism of each OHA now and in the future will be useful.

1 1

D. Management of Diabetes by Diet

1. History

The role dietary intake plays in the treatment of diabetes mellitus has been recognized for hundreds of years. Powers (22) summarized some of the important changes in dietary therapy for individuals with diabetes. In the year 5 AD, Aretaeus the Cappadocian recommended milk or cereals and starch, along with fruits and sweet wines for persons with diabetes. In slightly more recent times, the dietary recommendations varied quite widely from Willis' 1675 restriction to milk and barley water boiled with bread to Rollo's 1797 admonitions to avoid carbohydrates. In 1880 Bernard Naunyn pioneered the use of measured food intake and restricted calories, protein, and carbohydrate. During the next forty years, there were no consistent recommendations for dietary intake. Diets high in oatmeal or potatoes were suggested, and in 1912 Frederick Allen introduced the "Allen Starvation Treatment" which was a calorie-restricted, low-carbohydrate, high-fat diet. Immediately after the discovery of insulin in 1921, there was a drop in interest in dietary restriction. Geyelin attempted to "normalize" the diet in 1929 by relaxing the restriction on carbohydrate intake and in 1930 Rabinowitch made the first attempt to limit fat intake to help lower cardiovascular-renal disease. By the mid-1940s, high carbohydrate recommendations were common,

ranging from 72-95% of kilocalories consumed per day. In 1950 oral hypoglycemic agents and food exchange lists, with precalculated meal plans, were introduced. The use of this new type of medication (OHA) increased the number of patients able to achieve normal blood glucose levels without taking insulin and without strict dietary compliance. The use of food exchange lists provided a practical way to include recommended percentages of carbohydrate, protein, and fat in the diets of many people with diabetes

2. Current Recommendations

In the last 10 years, dietary treatment has been liberalized to include more carbohydrate and less fat (23). The increased carbohydrate content allows for increased dietary fiber intake, and allows caloric needs to be met while intakes of protein and fat are not excessive. The emphasis on fat reduction deals with its role in reducing the already elevated risk of heart disease (23). In addition, the importance of individualizing dietary prescriptions is stressed (23,24). In the 1986 revision of the food exchange lists, emphasis was also placed on limiting saturated fat and increasing fiber content of the diet of the individual with diabetes (25). The American Diabetes Association's (23) goals for diabetes nutritional management are summarized below by Powers (22):

- 1 . Improve blood glucose and lipid levels;
- 2 . IDDM: consistency in day-to-day food intake
NIDDM: weight management; and
- 3 . Provide adequate nutrition for all stages of life and coexisting medical conditions.

The specific current dietary recommendations by the American Diabetes Association (23) are given as general guidelines, with emphasis on the importance of individualization of the meal plan. Approximately 55-60% of the kilocalories from the

daily diet should be derived from carbohydrate sources, with 0.8 g protein per kg body weight (usually 12-20% of kilocalories) and less than 30% of the kilocalories derived from fat sources. Further recommendations encourage patients to consume less than 10% of the kilocalories from saturated fat, less than 10% (preferably 6-8%) of the kilocalories from polyunsaturated fat, and the remainder as monounsaturated fat. Other suggestions include a cholesterol intake of less than 300 mg/day and an increase in dietary fiber up to a daily maximum of 50 g.

3. Controversies

Despite these specific and often cited dietary recommendations from the American Diabetes Association (23), considerable controversy exists in many areas related to diet and exercise (26,27). Though there is little debate on the need to reduce saturated fat and cholesterol in the diets of people with diabetes, there is considerable disagreement over whether or not it is best to replace saturated fat in the diet with carbohydrate, unsaturated fatty acids, or monounsaturated fatty acids (26). The concept of a "set point" in the regulation of weight is gaining increasing acceptance in explaining the resistance of severely obese individuals to weight reduction, though exercise and behavior modification may be important factors in overcoming such physiologic resistance to body weight changes (27,28). There has been great interest in factors affecting postmeal plasma glucose levels, particularly the glycemic response observed after the consumption of individual foods. Currently there is no consensus as to whether or not the differences in glycemic response observed with individual foods will lead to a clinically useful reduction in postmeal plasma glucose levels when those foods are incorporated into mixed meals (26). The role of sodium, and possibly potassium and calcium, in controlling hypertension is of interest, while there is accumulating

evidence that hyperinsulinemia may also play a role in the development and control of hypertension (27). Though much emphasis is placed on the current role of diet in managing diabetes, scientific evidence indicates that the scope of dietary intervention may play an even greater role in the next century.

E. Management of Diabetes by Exercise

1. Benefits of Exercise

The Roman physician and philosopher Celsus (30 B.C. - 50 A.D.) was one of the earliest "health professionals" to suggest that exercise was an important form of treatment in the person with glycosuria (29). In the eighteenth and nineteenth centuries, the value of exercise became well accepted in European countries, though John Rollo in 1798 condemned physical activity for individuals with diabetes and prescribed total bed rest (30). In 1919, Allen, Stillman, and Fitz (31) were the first to show that exercise could lower the blood glucose concentration of patients with diabetes and transiently improve glucose tolerance. After the discovery of insulin, E. P. Joslin was one of the most well-known individuals who advocated exercise as a "cornerstone" in diabetes management. In Joslin's 1935 authoritative text, *The Treatment of Diabetes Mellitus* (12), he said:

Exercise tends to lower the blood sugar in the diabetic in whose body there is an adequate supply of insulin whether this be of endogenous or exogenous origin. This effect is so striking and so beneficial that exercise along with diet and insulin is now accorded a definite and prominent place in the every day treatment of diabetes. Patients themselves recognize and make use of the principles.

Patients with diabetes continue to make use of the principles cited above based on recent articles in *Diabetes Forecast* (32,33). This magazine, published by the American

Diabetes Association, is geared to individuals with diabetes and their families; the articles focus on specific ways to include exercise as a regular part of the daily routine.

As indicated earlier, the risk of heart disease and stroke in the individual with diabetes is 2-3 times greater than in the general population (8). A client's age and duration of diabetes are often identified as important risk factors in the development of atherosclerotic vascular disease, since hyperglycemia is believed to promote the development of arterial stiffness, thus contributing to heart disease (34). Three other risk factors have been identified as particularly important in the development of cardiovascular disease in persons with diabetes: elevated blood pressure, elevated serum triglycerides, and high levels of administered insulin (34,35). The reduction of plasma triglycerides, blood pressure, and insulin dosage are commonly cited advantages of exercise for people with diabetes, particularly those with NIDDM (36-40).

There are 4 generally accepted potential benefits of exercise in the management of diabetes (36,38,39):

- 1 . Maintenance or improvement of cardiovascular fitness in order to prevent or minimize the long-term cardiovascular complications of diabetes.
- 2 . Assistance in achieving euglycemia through modulating the body's sensitivity to insulin and increasing peripheral glucose utilization.
- 3 . Assistance in weight control and management.
- 4 . Participation in enjoyable physical and/or sporting activities.

These 4 benefits will be discussed in detail in the following sections. Other commonly cited benefits of exercise training are overall improved fitness, an improved sense of well-being, and an improved self-image (36,38,39,41).

a. Cardiovascular Fitness

A primary advantage of exercise is in improving cardiovascular fitness, which applies to individuals with IDDM or NIDDM. There is substantial evidence to indicate that regular exercise or physical activity in the general population can exert a positive

influence in decreasing the risk of heart disease. Paffenbarger and associates (42-46) have written extensively about the role of physical activity and its link to cardiovascular disease.

Cardiovascular Disease Risk Reduction

Paffenbarger and Hale (46) studied the energy expenditures of 6351 San Francisco Bay Area longshoremen who ranged in age from 35 to 74 years at the beginning of the study. These men were followed for a period of 22 years, to death, or to age 75 years. Their energy expenditure during work was classified as heavy (which required approximately 5.2-7.5 kcal/min), moderate (2.4-5.0 kcal/min), or light (1.5-2.0 kcal/min). Job transfers were checked annually to account for changes in caloric expenditure on the job. The age-adjusted coronary death rate for those in the high-activity category was 26.9 per 10,000 work years. This value was significantly lower than were the values for those in the medium- and low-activity categories, which were not significantly different from each other. (The respective age-adjusted coronary death rates of those in the medium- and low-activity classes were 46.3 and 49.0 per 10,000 work years.) The authors concluded that "repeated bursts of high energy output established a plateau of protection against coronary mortality" (46).

Paffenbarger and associates (42) examined physical activity and other life-style characteristics of 16,936 Harvard alumni, aged 35-75 years. Men who entered college in the period 1916-1950 were studied during the period from 1962 to 1978. Records of college physical examinations performed in the freshman year, along with records of participation in varsity sports during undergraduate attendance provided measures of blood pressure, body weight, height, and athleticism. These records were examined in conjunction with data on post-college physical activities, histories of personal health and parental death, and other information obtained by return-mail questionnaires in 1962 and

1966. Time and cause of death information were gathered from official death certificates between 1962 and 1978. Physical activity, such as walking, stair climbing, and sports play, related inversely to total mortality, primarily to death by cardiovascular or respiratory causes. As energy expended on physical activities increased from 500 to 3500 kcal/week, death rates declined steadily. Among alumni expending 2000 kcal or more in exercise per week, death rates were one-fourth to one-third lower than they were among less active men. Alumni mortality rates were significantly lower among the physically active individuals than were those in the less active group, with or without consideration of the additional risk factors of hypertension, cigarette smoking, extremes in body weight, gain in body weight, or early parental death.

Mechanism of Risk Reduction

One mechanism by which physical activity decreases the risk of coronary heart disease (CHD) is the reduction of low-density lipoprotein cholesterol (LDL-C) concentration and an increase of high-density lipoprotein cholesterol (HDL-C) concentration (47-51). Tran and Weltman (49) conducted a meta-analysis of 95 studies conducted in the 18 year period from 1955 to 1983. A meta-analysis is a quantitative approach to reviewing experimental studies that uses a variety of statistical techniques and applies research methodology to the characteristics and findings of the studies. All the studies under consideration examined changes in serum lipid and lipoprotein levels in response to exercise training. However, since changes in body weight during exercise training may confound lipid and lipoprotein level changes (52), the authors separated the 95 studies into 3 groups in which subjects either gained, maintained, or lost body weight. In the group in which subjects showed no weight change, there were significant decreases in total cholesterol, triglyceride, and LDL-C levels and in the cholesterol/HDL-C ratio associated with exercise training. In the group in which

subjects lost weight, each parameter cited above experienced an additional decrease beyond that experienced by the group with no weight change. However, in the group in which subjects experienced a weight gain, cholesterol, LDL-C, and triglyceride levels all showed mean increases.

The Lipid Research Clinics Program (47) suggested that lowered levels of total cholesterol and LDL-C were primarily responsible for the difference in coronary artery disease incidence between the group receiving a cholesterol lowering drug and the placebo group. Tran and Weltman (49) proposed that reducing cholesterol and LDL-C levels by exercise training should have the same beneficial effects on coronary artery disease risk as the administration of a cholesterol lowering drug. The meta-analysis data suggested that cholesterol and LDL-C levels were more affected by exercise training than they were by other parameters. The authors also noted that the greatest reductions in cholesterol and LDL-C levels were made when exercise training was combined with weight loss.

Risk Reduction in Persons with Diabetes

Epidemiological studies show that physical activity in the general population reduces the risk of coronary heart disease. Research studies show the reductions in total cholesterol and LDL-C levels and elevations in HDL-C levels may be the mechanism for this risk reduction. Across the literature there is general agreement that the positive changes seen in lipid profiles following exercise in the normal population should also hold true for the diabetic segment of the population (30, 36-38,40, 53).

Ruderman and co-workers (54) found quite modest changes in cholesterol levels when they studied 6 middle-aged men with NIDDM. None of the subjects were receiving any medication. All the subjects maintained their initial body weight within a range of 1 kilogram and none experienced hyperlipidemia. Each subject received a

bicycle ergometer to take home along with a predetermined schedule for exercise at least 5 times per week. Exercise was progressively increased over a period of 3-6 months according to the patient's abilities and willingness. Plasma triglyceride and cholesterol values from 5 of the patients were determined from blood samples drawn 1 week before the initiation of exercise and 1 week after completion of the exercise period. Changes seen were quite modest; physical training caused an average decrease in plasma triglycerides from 144 mg/dL to 122 mg/dL. Plasma cholesterol decreased by an average of 26 mg/dL in 4 of the 5 individuals. In the case of the fifth person, the total cholesterol increased by 20 mg/dL even though his triglyceride level was diminished. However, this patient discontinued his physical training for a period of 4 weeks during the study. The authors attribute the rise in cholesterol in that case to a possible seasonal variation in cholesterol levels, along with other factors. In this study, only total cholesterol levels were examined, not the various lipoprotein fractions. In addition, techniques for measuring plasma cholesterol have become much more precise in the last decade.

Another study of individuals with diabetes was conducted by Barnard and associates (55) who examined the effectiveness of the Pritikin Program of diet and exercise in treating people with NIDDM. The exercise consisted of a daily walking program and a supervised aerobic exercise class 5 times per week. The dietary principles were: an increased intake of complex carbohydrate and fiber, with decreased fat to the level of less than 10% of total kcal from fat. Data were obtained from 60 patients who completed the 26 day residential program at the Pritikin Longevity Center. The group as a whole lost an average of 4.3 kg of body weight, dramatically decreased usage of oral hypoglycemic agents or insulin, and reduced the average fasting blood glucose level from 194.9 to 144.6 mg/dL. The serum cholesterol level was reduced

from an average of 225.4 to 181 mg/dL and the mean triglyceride level decreased from 283.7 to 186.2 mg/dL. However, with concurrent changes in dietary intake as well as physical activity, it is difficult to draw the conclusion that physical activity alone was responsible for the lipid changes.

Rönnemaa and co-workers (56) studied the effects of 4 months of physical exercise on metabolic control, serum lipids, and lipoprotein metabolism in persons with NIDDM. Thirteen patients were randomly assigned to an exercise program consisting of 45 minutes of aerobic exercise at 70% of maximal aerobic capacity for 5-7 sessions per week, while 12 other patients were assigned to the control group and received no instruction on exercise. Measurements were conducted at the beginning of the study, and after 6 weeks and 4 months of physical training. Exercise training produced significant improvements in glycosylated hemoglobin (an indicator of blood glucose level for the previous 5-6 weeks), maximal aerobic capacity, and a reduction in body weight. The same parameters were unchanged in the control group. With exercise, total and LDL-C levels declined and HDL-C levels increased. Serum triglyceride levels decreased during the first 6 weeks of exercise, but the improvement was not sustained at 4 months. There were no significant changes in the lipid profiles of the control group. The authors concluded that regular long-term physical exercise in the person with NIDDM induces favorable changes in the lipid profile that may reduce the risk of cardiovascular disease.

b. Euglycemia

Acute Effects

Another advantage of physical activity is its effect on insulin and glucose utilization in reducing blood glucose levels. The acute blood glucose lowering effect of physical activity on the well insulinized patient with diabetes has been well documented

(31, 57-60). Kemmer and associates (57) recorded a pronounced fall in blood glucose levels by 15% immediately and by 50% 30 minutes after the onset of exercise when studying 9 people with IDDM.

Schiffrin and Parikh (60) focused on the role of accommodating planned exercise and suggested simple guidelines for unplanned exercise in the individual with IDDM. The authors examined the responses of 7 adolescents with Type I diabetes receiving insulin pump therapy and 6 adolescents with IDDM treated with 3 subcutaneous insulin injections per day. The effect of 45 minutes of cycle ergometer exercise on blood glucose regulation was studied. The exercise was conducted at 55% of the maximal oxygen uptake 2 hours after the morning insulin injection and a breakfast meal. The subjects were studied on 5 different days in random order: 1) resting control day, 2) exercise preceded by the usual dose of insulin, 3) exercise preceded by one-half the usual dose of insulin, 4) exercise preceded by two-thirds the usual dose of insulin, and 5) exercise without the usual dose of insulin. When subjects received their usual insulin dosage, there was a significant decrease in blood glucose levels in all subjects. Symptomatic hypoglycemia occurred in 4 of the 7 receiving insulin pump therapy and in 3 of the 6 using multiple insulin injections. This condition was quickly corrected by oral administration of 25 g of glucose. However, the plasma glucose levels of the subjects on the resting day and on the 2 reduced insulin days were not significantly different from each other. Exercise without the usual insulin dosage resulted in hyperglycemia for both groups of subjects. This last finding reinforced the fact that the acute blood glucose lowering effect of exercise is only present in those individuals with adequate insulin.

Transient Effects

There is considerable discussion in the literature over the exact nature of the beneficial role of exercise for the person with diabetes. It appears that the blood glucose lowering effect of physical activity on the well insulinized person with diabetes is due primarily to the cumulative effect of transient improvements in glucose tolerance which follow each individual period of exercise, rather than to increased levels of physical fitness.

Zinman and colleagues (61) studied the acute and long-term effects of glucose control in subjects with IDDM. They found that acute decreases in plasma glucose levels induced by physical activity seemed to be offset by increased caloric intake on exercising days, thus the glycosylated hemoglobin was essentially unchanged through the 12 week period. Thirteen subjects with IDDM and 7 control subjects without diabetes performed 45 minutes of cycle exercise 3 times per week for 12 weeks. In the subjects with diabetes there was an acute glucose lowering effect with each exercise session (average reduction from 225.8 to 148.5 mg/dL). Fasting blood glucose and glycosylated hemoglobin (HbA₁) remained essentially unchanged from pretraining to the end of training for both the control and diabetic groups. Total caloric intake of the subjects with diabetes, which was assessed by diet history, increased significantly on exercising days by approximately 300 kcal. Caloric intake of the control subjects was not assessed, although they experienced a mean weight loss during the training period.

Schneider and associates (62) studied 20 sedentary men with NIDDM and 11 control subjects matched for previous physical activity, age, and weight. After 6 weeks of activity, 3 periods per week, 32 min per period, the subjects' glycosylated hemoglobin levels, oral glucose tolerance, and plasma glucose levels were measured. HbA₁ levels decreased in the persons with diabetes during the training program (12.2%

± 0.5 to $10.7\% \pm 0.4$; $p < 0.02$). Only minimal improvement was observed in the oral and intravenous glucose tolerance measurements determined 72 hours after the last exercise period. However, the plasma glucose levels were significantly lower at 12 hours than they were at 72 hours after exercise in 8 subjects tested at both time points. These data suggest that a decrease in glycosylated hemoglobin levels can be achieved by individuals with NIDDM with an increase in physical activity. This change is due probably to the cumulative effect of transient improvements in glucose tolerance following each individual period of exercise.

The effects of diet and exercise interventions on control and quality of life in persons with NIDDM were studied by Kaplan and co-workers (28). They evaluated the effects of a superimposition of a behavior-modification program on clinical treatment programs for 76 volunteers with NIDDM, 48 of whom received insulin or oral hypoglycemic agent therapy. The subjects were assigned to 1 of 4 programs: 1) conventional 1200 kcal/day diet, 2) prescribed exercise only (based on a graded exercise test), 3) 1200 kcal diet plus exercise, and 4) education only (control group who attended lectures, with no behavioral component). Each program required weekly meetings for 10 weeks, and detailed evaluations were completed prior to the program and after 3, 6, 12, and 18 months. Seventy individuals completed the 18-month follow-up study. The glycosylated hemoglobin (HbA_{1c}) levels of the subjects who consumed the 1200 kcal/day diet and exercised and those of the control group, at the 18 month follow-up study, were significantly different at the $p < 0.05$ level. The reduced calorie plus exercise group's HbA_{1c} mean level decreased from 9.18% to 7.70% over the 18 month period, while the control group's HbA_{1c} mean level increased from 8.21% to 8.57%. Thus, in this patient population, the transient hypoglycemic effect of exercise did result in improved blood glucose control when combined with dietary control.

Decreased Insulin Requirements

Decreased exogenous insulin requirements are frequently seen in persons with IDDM who have regular and frequent periods of physical activity (30, 58, 60, 63). Schiffrin and Parikh (60), in the study of adolescents with IDDM discussed earlier, emphasize that reduction in the amount of insulin injected in anticipation of postprandial exercise or an intake of additional glucose can prevent hypoglycemia in the patient with IDDM. Costill and associates (63) studied 12 men with IDDM and 13 non-diabetic control subjects during a 10 week period of physical training. The training consisted of endurance running for 30 minutes per day, 5 days per week. The men with diabetes reduced their daily insulin dosage by an average of 23%, with most of this adjustment in insulin dosage occurring in the first 2-3 weeks of training. The daily insulin dosage remained relatively constant in the remaining 7 weeks of physical training. Quite often, those persons with NIDDM are also able to reduce their dosage of insulin or oral hypoglycemic agents when participating in regular exercise (36,37,64), as described in the study at the Pritikin Longevity Center (55).

Increased Insulin Sensitivity

There is considerable variability in insulin resistance in older persons, though insulin action tends to decline with increasing age. Hollenbeck and co-workers (65) compared 7 healthy older men who either ran, swam, or bicycled for at least 45 minutes, 3 times per week to 13 healthy older men who did not exercise regularly. All subjects were 60-75 years in age, were not obese, and had normal glucose tolerance. The exercising group had a 32% greater maximal oxygen uptake than did the control group. Insulin-stimulated glucose disposal, expressed as metabolic clearance rate, was 43% greater in the exercising group than it was in the control group. The authors concluded that the level of physical activity, as assessed by VO_{2max} , could account for

50% of the variance in insulin-stimulated glucose disposal in this group of older men. This finding highlights the fact that reduced physical activity contributes to the metabolic changes associated with aging. Kolata (66) emphasized this point in a summary of the National Institutes of Health (NIH) Consensus Development Conference on Diet and Exercise in Non-insulin-dependent Diabetes Mellitus (67). He stated "If ever there were a disease that is caused by life-styles, it is non-insulin-dependent diabetes mellitus. By far the predominant form of diabetes, it is a disease almost exclusively of overweight, sedentary adults" (66).

The decrease in insulin requirement and improved glycosylated hemoglobin values observed in some subjects with diabetes who exercise may be related to an enhanced sensitivity to insulin associated with periods of physical activity. Wallberg-Henriksson and associates (68) studied 9 male patients with IDDM who participated in a 16-wk training program consisting of either 1 hour of jogging, ball games, or gymnastics performed 2-3 times per week. They evaluated the sensitivity of the peripheral tissues to insulin before and after the training period, using the insulin clamp techniques described by DeFronzo et al. (69). The average insulin sensitivity of the subjects increased by 20% after the training.

In the NIDDM individual in which exogenous insulin is not as important a factor, insulin resistance appears to be the major problem of glucose intolerance. Schneider and co-workers (62) have demonstrated improved glycemic control, via decreased levels of glycosylated hemoglobin, in a group of 20 sedentary men with NIDDM during 6 weeks of physical training, while body weight was maintained. The mechanisms for improved glucose tolerance following acute periods of exercise by the individual with diabetes require more investigation. However, it appears that the frequency of exercise sessions is a major factor in the positive effect of physical activity

on blood glucose regulation. A study by Rogers (70) supports this belief. They showed an improvement in glucose tolerance in 8 of 10 men with glucose intolerance after only 7 days of physical activity for 1 hour daily. These findings suggest that the improvement in glucose tolerance was due to a decrease in resistance to insulin, i.e. to a greater susceptibility to the action of insulin. Due to the relatively short time span of this activity program, the authors concluded that the improvement in glucose tolerance was a consequence of persistent but short-term effects of the last bouts of exercise, rather than long-term adaptations to training.

The increased sensitivity to insulin associated with increased levels of physical activity may be due to increased binding of insulin at the receptor sites. Gavin and co-workers (71) studied 8 subjects who had been involved in a physical training program for 45 minutes per day, 5-7 times per week for the preceding 6 months. The subjects were then restricted to physical inactivity for 10 days. Monocyte insulin receptor binding was measured on the first and tenth day of inactivity. On the twelfth day, the subjects performed a period of exercise comparable to their usual training session and insulin receptor binding was again measured. All subjects had higher insulin receptor binding in the trained state than they did after the sedentary period. Six of the 8 subjects had a 35% or greater reduction in insulin binding after becoming sedentary. However, the subjects' insulin receptor binding returned to levels equal to or greater than the initial value in the trained state after only 1 bout of exercise. The authors suggested that improved insulin sensitivity with exercise may reflect residual effects of the last exercise period, and may in part be mediated by altered insulin receptor binding. The exact mechanism for the improved insulin sensitivity associated with physical activity remains unclear, but there is agreement with Gavin et al. (71) that altered insulin receptor binding plays a major role in this phenomenon (68).

Risks of Hyperglycemia

While physical activity reduces blood glucose levels in most individuals with diabetes, in the subject whose blood glucose level is not controlled, there is a risk of a greater rise in blood glucose levels. This occurs primarily during periods of insulin deficiency. The general recommendation is if blood glucose is equal to or greater than the range 250-300 mg/dL, exercise should be postponed and supplemental insulin should be administered to reestablish good control (36-39, 41). When physical activity is undertaken in such a hyperglycemic state, peripheral glucose utilization is impaired, lipolysis is enhanced, and hepatic glucose production and ketogenesis are stimulated. These changes result in a rapid rise in the already elevated blood glucose concentration and the rapid development of ketosis (57). While patients with IDDM are the group most affected by the problem of hyperglycemia with exercise, individuals with NIDDM who require insulin or oral hypoglycemic agents must also exercise caution in establishing blood glucose control before strenuous physical activity.

c. Weight Management

A third advantage of physical activity to the individual with diabetes is that of weight management or maintenance. Excess pounds are not generally a problem for the individual with IDDM. However, they are a problem for approximately 80% of the individuals with NIDDM who are classified as overweight (67). When exercise is combined with caloric restriction, the increased energy expenditure required by exercise may increase weight reduction by producing a greater degree of negative energy balance (38,67). In the NIH Consensus Development Conference Statement on Diet and Exercise in Noninsulin-dependent Diabetes Mellitus, the participants stressed the synergistic role of diet and exercise: "Physical activity may assist in reducing body fat,

but exercise without caloric restriction appears ineffective" [in reducing body weight or body fat] (67).

General recommendations from practitioners are that exercise may be extremely helpful to the person with NIDDM for weight management (36,38,39,41,72). The NIH panel (67) also pointed out that many of the metabolic effects of exercise are short-lived, as discussed earlier in this chapter. Due to this fact, the NIH statement stressed the importance of encouraging patients with NIDDM to choose forms of exercise that they are likely to engage in frequently and to continue over their lifetimes.

d. Sports Participation

Another advantage of exercise in the regimen of an individual with diabetes is that it allows participation in enjoyable sporting activities. Diabetes is a chronic debilitating disease. The judicious encouragement of physical activity may provide an outlet for frustration, especially for those persons recently diagnosed with the disease who have previously enjoyed athletic pursuits. Commonly young patients with IDDM are restricted from organized athletics because of the risks discussed later in this chapter (38), but they can safely compete by working with their health professionals to individualize caloric intake and insulin needs (41). Certain precautions are encouraged to minimize the risks of exercise for a person with diabetes. Righter, Ruderman, and Schneider (40), however, have gone so far as to say that "for most diabetic patients, the benefits of regular exercise far exceed the risks."

e. Other Benefits

Other commonly cited benefits of physical activity include improved levels of fitness, improved sense of well-being, and improved self-image (36-39,41). A recent study by Blair and associates (73) highlights the very real benefit "improved fitness" may offer to all persons, including those with diabetes.

This study examined the relationship between physical fitness and the risk of all-cause and cause-specific mortality in 10,224 men and 3,120 women who received a medical check-up at The Cooper Clinic, Dallas, Texas during the period 1970 through 1981 (73). The participants had to achieve at least 85% of their age-predicted maximal heart rate on a treadmill test and have no personal history of heart attack, hypertension, stroke, or diabetes. Physical fitness was measured by a maximal treadmill exercise test. After 8 years of follow-up, 283 deaths were reported. The researchers found that the least-fit individuals had a higher risk of death from all causes than did the persons in the moderate- and high-fitness categories. Even after age, smoking status, lipid levels, systolic blood pressure, fasting glucose levels, and family history of heart disease were statistically adjusted for, deaths from all causes declined as fitness levels increased. The relative risks of the very high fitness individuals and the more moderate exercisers were very similar, which translates into a belief that even activities such as a low-intensity 20-30 minute walking program 3 or 4 times per week may improve the fitness level, and possibly increase the longevity of participants, including those with diabetes.

Raglin (74) in a review of "Exercise and Mental Health" states that "participation in long-term exercise programmes has been found to improve self-esteem." In describing another psycho/social benefit of physical activity, Revicki (75) defines quality of life as a multidimensional concept that encompasses the physical, emotional, and social components associated with an illness or its treatment. He believes that health care professionals are convinced increasingly that one of the major objectives of medical care is the enhancement of quality of life, rather than the cure of the disease or increased survival (75). A study by Kaplan and co-workers (28), described in detail earlier in this chapter in Section 1: Benefits of Exercise, (b) Euglycemia (Transient Effects), looked at metabolic control and quality of life measures of persons with

NIDDM. In Kaplan's study 76 volunteers were assigned to 1 of 4 programs: diet, exercise, diet plus exercise, and education only (control). The quality of life measurements reported here were taken from the 70 persons completing the 18-month follow-up study. The combination of diet-plus-exercise group reported 0.06 units of improvement in well-being over the period, as compared to 0.03 units for the diet group, zero for the exercise group and -0.04 for the control group. The difference between the combination diet-plus-exercise group and the control group was significant at the $p < 0.05$ level.

2. Risks of Exercise

Exercise may be encouraged for almost all individuals with diabetes although there are risks involved (38-40, 76). Exercise is never recommended for an individual with poorly controlled blood glucose levels. Due to the high incidence of cardiovascular disease, a medical examination and exercise testing is recommended for persons over the age of 30 or for young individuals with diabetes who have had the disease for 10 years or more. There is a particular need for attention to appropriate footwear due to neuropathy; injury to the feet may occur which the patient may not notice due to decreased sensitivity. Patients with retinopathy need to exercise care in performing activities which cause excessive jarring or marked increases in blood pressure; swimming is especially recommended for these persons (77).

The individual with diabetes must understand how to deal with exercise-induced hypoglycemia which can occur up to 24-48 hours after the exercise session (78). The individual with IDDM must learn how to cope with extra carbohydrate consumption and possible changes in insulin administration in dealing with hypoglycemic episodes. The patient with NIDDM using oral hypoglycemic agents or insulin may also have to deal

with these concerns (21,36,39). The patient's role in monitoring blood glucose before, during, and after physical activity can not be overemphasized since that information is critical in determining needed insulin and dietary adjustments (41). Other prudent safety measures for physically active individuals with diabetes include: carrying a source of readily available carbohydrate; drinking plenty of water before, during, and after exercise; carrying a source of identification with diabetic condition noted; exercising with a partner; and using caution when exercising in moderate to extreme heat.

F. Roles of Professionals in Diabetes Management

1. Physician

The physician is the professional ultimately responsible for managing diabetes mellitus in conjunction with the patient. It is the physician who primarily determines the course of therapy. He or she may recommend diet alone, diet in conjunction with oral hypoglycemic agents or insulin, and/or diet, medication, and exercise. However, physicians rarely have the time or the training to counsel patients with diabetes on their diets (15,79). This role has traditionally and quite logically been assumed by the dietitian (80).

Physicians vary in their training on the mechanics of developing an exercise regimen and their time to counsel in this area is also limited. The American Diabetes Association (80), in a recent position statement "Standards of Medical Care for Patients with Diabetes Mellitus" identified exercise history as an essential component of the medical history. In the same statement, "recommendation for life-style changes (e.g., exercise, smoking cessation)" was identified as a part of the management plan between the patient/family and the entire health-care team. So, the physician or other health-care

team members have responsibility for initiating education about the role of exercise in diabetes management in those persons who are not currently physically active.

A major role of the physician is to conduct a thorough medical examination of the person who desires to initiate a regular, vigorous exercise program. Advising the patient on any limitations he or she should observe, as well as providing guidance on the types of activities recommended are responsibilities which fall to the physician. Aside from these areas, patient counseling in the area of exercise has not clearly fallen into the province of any one health-care professional, since exercise physiologists are not routinely on staff in medical centers or in community agencies.

2. Dietitian

In the hospital setting, dietitians may counsel patients newly diagnosed with diabetes several times before their release and provide follow-up through out-patient clinics. In addition, there are both in-patient and out-patient classes for people with diabetes in many hospitals or clinics. Many community agencies also provide individual and group counseling for persons with diabetes, where dietitians are usually involved. The importance of the dietetic practitioners' role in dietary education is not questioned. In the American Diabetes Association Position Statement (80), "individualized nutrition recommendations and instructions, preferably by a dietitian" are an essential part of the management plan for patients with diabetes mellitus. Dietary intervention alone is enough to control the blood glucose level in many individuals with NIDDM. Before oral hypoglycemic agents are prescribed, dietary therapy is generally recommended as the first course of treatment in managing NIDDM (15), particularly if the patient is overweight. The National Institutes of Health (NIH) Consensus Development Conference Statement on Diet and Exercise in Noninsulin-dependent Diabetes Mellitus

(67) states that "since most persons with NIDDM have excess body fat, the primary treatment is reduction of weight through caloric restriction."

Dietitians in both clinical and community settings counsel persons with diabetes regularly on the role of dietary intake in achieving normal blood glucose and optimal lipid levels. Recent articles by Franz (41) and Wheeler et al. (81) in the *Journal of the American Dietetic Association* highlight the interest and involvement of dietitians in including information about exercise in counseling individuals with diabetes. One of the most recent, comprehensive publications on nutritional management of diabetes, the *Handbook of Diabetes Nutritional Management* (82), includes considerable information about the relationship between exercise and the management of diabetes (36). In an address to the Tennessee Dietetic Association, Alice Smitherman (1), a recent past president of the American Dietetic Association, said: "With the right tools and education, dietitians should be about the business of teaching exercise." However, there have been no published studies to document the extent to which dietitians are actually counseling clients in the area of exercise or physical activity. The focus of this study was to assess the degree to which Tennessee dietitians are counseling patients with diabetes to incorporate physical activity into their lifestyles.

G. Knowledge

A second objective of the study was to determine Tennessee dietitians' knowledge about the role of exercise in diabetes management. Despite exercise's recognized role as an adjunct to dietary therapy in the individual with diabetes, there is no professional requirement for dietitians to have expertise in the area of exercise or physical activity. With the increasing influence of the fitness movement and the

emphasis on health promotion, there will be an increasing need for dietitians to be knowledgeable about the role of exercise in promoting health for the general population, as well as for the significant population with diabetes. However, there is little published information about dietetic practitioners' knowledge of the role of exercise in health promotion or its role in the management of diabetes mellitus.

H. Health Promotion Activities

Another major factor which may exert an influence on whether or not Tennessee dietitians incorporate information about exercise in counseling patients with diabetes is their own personal health promotion activities, particularly the regularity with which they themselves exercise. Martin et al. (83) studied the health promotion and disease prevention beliefs and behaviors of Texas dietitians. This study was part of a larger one by Holcomb and associates (84) which examined the health behaviors and beliefs of 4 allied health professions regarding health promotion and disease prevention. Martin (83) found that in Texas, dietetic practitioners' personal health habits related to not smoking and to getting regular exercise were significantly associated with belief in the importance of that behavior for others. It seems probable then that Tennessee dietitians who get regular exercise themselves would also believe in the importance of that behavior for others, and would therefore discuss the role of exercise in the management of diabetes more frequently with their clients with NIDDM than would the Tennessee dietitians who do not participate in regular exercise. However, with the exception of the Texas study cited above, there has been little documentation of the health promotion activities of dietetic practitioners.

Of the 15 identified health problems given national priority in *Promoting Health/Preventing Disease: Objectives for the Nation* (85), Martin (83) identified 9 as having a direct effect on the practice of dietetics. One of those 9 objectives was physical fitness and exercise. Martin (83) recommended that "dietetic practitioners should be trained in the appropriate areas of health promotion and disease prevention in order to make significant contributions to the achievement of the national objectives." She cited the need for the dietetic profession to place greater emphasis on health promotion and disease prevention due to the advent of the prospective payment systems for health care and with increasing employment of dietitians in non-acute health care settings. The implications of this training are far-reaching, as dietetic practitioners are expanding their personal and professional horizons into the health promotion and wellness areas.

CHAPTER 3

METHODS AND PROCEDURES

A. Research Design

The research project was a mail survey of dietitians living in Tennessee. The thrust of the project was to identify those dietitians who counsel people with Type II Diabetes Mellitus and to determine if they include information about exercise in counseling sessions. This research project fits Kerlinger's (86) definition of ex post facto research.

Ex post facto research is systematic empirical inquiry in which the scientist does not have direct control of independent variables because their manifestations have already occurred or because they are inherently not manipulable. Inferences about relations among variables are made, without direct intervention, from concomitant variation of independent and dependent variables. (86)

The survey was descriptive research which attempted to determine the frequency with which a particular action occurred, exercise counseling, and to establish relationships among variables. Information was gathered on a variety of Tennessee dietitians' counseling practices regarding the role of exercise in the management of NIDDM. In particular, emphasis was placed on determining the frequency of exercise-related counseling and the amount of time spent discussing exercise-related topics. In addition, the settings for counseling of clients with NIDDM were considered, as well as the dietitians' monthly caseload, methods of providing exercise information, exercise-

related topics discussed, and reasons for including/excluding exercise information. The study attempted to relate these counseling practices to the dietitians' knowledge about the role of exercise in diabetes management, as well as to the dietitians' personal health promotion activities, particularly regular exercise.

B. Sample Selection

There were approximately 1200 dietetic professionals living in the state of Tennessee in August, 1988 based on figures provided by the Tennessee Dietetic Association (TDA) Executive Director, Carole Harragh. Members of the American Dietetic Association (ADA) living in Tennessee or with a Tennessee mailing address are automatically members of TDA. This group of 1200 professionals is composed of both ADA/TDA members and non-members. Six categories of dietetic professionals are included in the TDA roster: (1) active registered, (2) registered non-members, (3) affiliate (students, non-registered members, etc.), (4) honorary, (5) active-registration eligible, and (6) retired. Registered dietitians have at least a Bachelor's degree and have completed an ADA-approved course of study that includes didactic coursework and supervised field experience; have successfully completed a national registration exam; and maintain 75 hours of continuing education every 5 years. Since the focus of the study was on practicing dietitians, the 2 categories of (1) active registered members of TDA and (2) active registered non-members of ADA/TDA (living in Tennessee) were selected as the population for this research project. Mailing labels (in zip code order) of this population were requested from TDA. The list had been updated in August, 1988, immediately before its purchase.

There were 970 subjects in the population after the names of participants in the pilot study were eliminated. Members of the panel of experts, doctoral committee, and pilot study were not included in the population to be sampled. With a population of 1000, 286 is the sample size recommended to ensure representation of the population at the 95% confidence level.

A random sample of 286 dietitians was selected from the mailing labels purchased from the Tennessee Dietetic Association. First, a list of 3 digit random numbers was generated by computer. Then the master list of mailing labels was numbered from 1 to 970. A random starting point was established on the list of random numbers. Finally, the first 286 applicable random numbers were noted on the master list of mailing labels which then identified the dietitians in the sample.

C. Survey Instrument

1. Development

The survey instrument was developed over the course of 7 months with considerable input from a variety of sources, including a survey of literature, input from the doctoral committee members and chairperson, conversations with nutrition and diabetes professionals in the Knoxville area, and a panel of experts (described in the following section of this text). Judy Boser, Ph.D., a Computer Systems Specialist with the University of Tennessee Bureau of Educational Research provided input and served as a consultant. She has an Adjunct Appointment in the Department of Educational Psychology.

A copy of the survey instrument is included in Appendix 1 and in a pocket at the back of the text. The original instrument was printed on 8 1/2 inch wide by 14 inch

long buff-colored paper, folded into a booklet format of 7 inches wide by 8 1/2 inches long. The booklet was 12 pages long, and fit easily into a business size envelope when folded vertically. The 4 major sections of the survey instrument are described below:

- A . Dietitians' counseling practices, especially information about whether or not information about exercise is included in counseling sessions of clients with NIDDM.
- B . Dietitians' personal health promotion activities.
- C . Dietitians' knowledge of the role of exercise and its relationship to dietary intake and insulin requirement in the person with diabetes.
- D . Background and demographic information, including educational background, number of years in practice, etc.

Using the advice of Dilman (87) and Sudman and Bradburn (88), careful consideration was used in the placement of the sections just described. Attention was given to "hooking" the respondent, i.e. stimulating enough interest to begin to complete the questionnaire. "Boring" demographic information was left until the end and the potentially "threatening" knowledge section was sandwiched in the middle of the survey with an introduction to reduce the "threat." The sections were ordered in the instrument as listed above.

2. Validity

A panel of experts validated the practice, knowledge, and health promotion sections of the survey instrument. Carmines and Zeller (89) define validity as "the extent to which any measuring instrument measures what it is intended to measure." A panel of experts is a frequently used method of establishing internal validity.

The panel of experts included national and local authorities on the subject of exercise and/or diabetes management. The panel consisted of 3 members of the doctoral

committee: John Eaddy, M.D., Betsy Haughton, Ed.D., and Ed Howley, Ph.D. Two Knoxville dietitians who counsel people with diabetes were included: Carolyn Perry-Burst, M.S., R.D. and Jane V. White, Ph.D., R.D. In addition, 2 officers from the American Dietetic Association's Diabetes Care and Education Practice Group, who also work at diabetes treatment centers, participated: Arlene Samowich, M.S., R.D. and Joyce Greene, M.S., R.D. Marion Franz, M.S., R.D., Director of Nutrition at the International Diabetes Center, Inc., a recognized nutrition authority in the subject of exercise and its relationship to dietary intake and insulin requirement, also provided feedback. Changes recommended by this panel of experts were synthesized and implemented by the researcher and major professor.

3. Pilot Test

A pilot test was conducted with the instrument in September, 1988. Ten registered dietitians completed the survey instrument and made recommendations for changes to increase the clarity and ease of completing the survey. The participants in the pilot test were then excluded from the subject pool. These respondents reported a range of 20-30 minutes to complete the survey instrument. Modifications of the survey instrument were made again.

D. Informed Consent

This survey complied with all recommendations for informed consent as specified by the University of Tennessee Committee on Research Participation for Human Subjects. Form A: Certification of Exemption from Review for Research

Involving Human Subjects was filed with and accepted by the Director, Office of Research Compliances.

The participants were informed that the survey instrument was numerically coded only for ensuring follow-up of all respondents. The coding prevented annoying follow-up requests to individuals who had already responded. Respondents who requested educational materials (provided as an incentive for participation) were instructed to make their request on a separate sheet of paper, to prevent the respondent's name from being on the survey instrument.

The information collected was and will not be disseminated on an individual basis, and is only reported in group statistics. Only the researcher and doctoral committee chairperson have access to the coded identification list. The survey instruments will be stored in a locked file cabinet in the researcher's home office for the minimum period of 3 years.

E. Attempts to Increase Survey Participation

During the months preceding the actual distribution of the survey instrument, the researcher made efforts in several areas to increase the probability of survey participation. These efforts focused primarily on using the channels of the Tennessee Dietetic Association to inform practicing dietitians in Tennessee of the upcoming survey, with emphasis on the importance of participation if they were randomly selected as part of the sample. Specific actions are identified in the following paragraphs.

1. A trip was made to the Tennessee Dietetic Association Spring Conference on April 13, 1988. During the business meeting section, the researcher was allowed time to explain the nature of the project and to solicit cooperation from the T.D.A. members present. During the conference, she was able to talk with representatives of 4 of the 6 district dietetic associations. The

researcher sought their assistance in encouraging support among the members of their districts and received very positive feedback about interest in the project.

2. Letters to the 6 district dietetic association presidents were mailed on April 15, 1988. In addition to a letter asking for their support, a brief memorandum explaining the research project was enclosed. The presidents were asked to include this memorandum in the minutes of the April or May dietetic association meetings which are mailed to all members. Confirmation was obtained that 4 districts included the information in their minutes as requested.
3. A brief article about the research project and a request for participation was published in the 1988 summer edition of *The Volunteer*, the quarterly publication of the Tennessee Dietetic Association.
4. The Tennessee Dietetic Association President agreed to write a letter of endorsement for the research project which would encourage participation from members of the state organization, see Appendix 2. This letter was duplicated and enclosed with the original mailing.

F. Survey Implementation

The initial survey instrument package was mailed on October 6, 1988. Table 3-1: Survey Implementation Calendar identifies the specific dates of the mailings/phone calls which comprised the survey implementation. See Appendix 2: Survey Correspondence for copies of the letters described below. The initial mailing contained the survey instrument (Appendix 1), a cover letter from the researcher and major professor, a letter of endorsement from the president of the Tennessee Dietetic Association, and an addressed stamped envelope to facilitate return of the survey instrument. A postcard reminder was mailed to all participants in the study on October 19, encouraging their response and/or thanking them for their participation. On November 2, a second cover letter and survey instrument were mailed to the nonrespondents. The final attempt to solicit response was a third cover letter and survey instrument sent by certified mail on November 28, 1988.

TABLE 3-1
Survey implementation calendar

Date of event	Implementation
October 6, 1988	Survey instrument, cover letter, letter of endorsement from Tennessee Dietetic Association president, and addressed, stamped envelope mailed to sample of 286 dietitians.
October 16, 1988	Reminder/thank you postcard mailed to entire sample.
November 2, 1988	Second cover letter and survey instrument mailed to 101 nonrespondents.
November 28, 1988	Third cover letter and survey instrument mailed by certified mail to 61 nonrespondents.
December 19, 1988	Phone follow-up begun.
December 28, 1988	Educational materials mailed to 48 respondents who requested them.

Each effort resulted in additional responses. Table 3-2: Survey Response Rate Over Time provides the exact weekly response rate after the survey instruments were mailed. As would be expected, the majority of the respondents (65%) returned the survey within the initial 4 week period. The response rate dropped considerably after that time, but the average response was 9 additional questionnaires per week for an additional 6 weeks. Six additional questionnaires were received during the period, December 17, 1988 to January 13, 1989.

Nonrespondents comprised 14% of the sample and were classified in several ways in Table 3-3: Classification of 40 Nonrespondents. In 2 cases, the original address was incorrect. In 1 of those cases, no forwarding address could be located and in the other case, the forwarding address was also incorrect. Phone numbers for 12 nonrespondents could not be located despite the use of multiple references. The district dietetic membership directories, Tennessee area telephone books, Directory Assistance, and the University of Tennessee Alumni Office were used as sources to locate telephone numbers of nonrespondents. Five nonrespondents refused by either written or verbal means to provide any information for the research project. Five other nonrespondents could not be reached by phone: their phone was not answered, they did not return the researcher's call after 2-3 messages, or their phone service had been disconnected. Sixteen of the nonrespondents agreed to talk with the researcher over the phone and answered the questions on the phone survey script/form in Appendix 3.

Telephone follow-up was initiated on December 19, 1988 and with the exception of 2 respondents who were on extended leave, was completed by December 26, 1988. Information on employment, work setting, education, and counseling of clients with Type II diabetes was gathered. Age, height, weight, and exercise habits were also

TABLE 3-2
Survey response rate over time

Period of time	No. of surveys returned (n=246)	% of sample (n=286)	Cumulative no. of surveys returned	Cumulative % of sample (n=286)
Week ending Oct. 14, 1988	79	27.6	79	27.6
Week ending Oct. 21, 1988	50	17.5	129	45.1
Week ending Oct. 28, 1988	39	13.6	168	58.7
Week ending Nov. 4, 1988	17	5.9	185	64.7
Week ending Nov. 11, 1988	9	3.1	194	67.8
Week ending Nov. 18, 1988	20	7.0	214	74.8
Week ending Nov. 25, 1988	8	2.8	222	77.6
Week ending Dec. 2, 1988	6	2.1	228	79.7
Week ending Dec. 9, 1988	7	2.4	235	82.2
Week ending Dec. 16, 1988	5	1.7	240	83.9
Period Dec. 17, 1988 through Jan. 13, 1989	6	2.1	246	86.0

TABLE 3-3
Classification of 40 nonrespondents

No. of respondents	Classification of nonrespondents
2	Nonrespondents' initial addresses were incorrect--unable to locate correct addresses
12	Nonrespondents were lost to follow-up due to researcher's inability to reach by phone.
5	Nonrespondents did not return phone messages.
5	Nonrespondents refused to provide information.
16	Nonrespondents talked with researcher to complete phone follow-up form.

obtained. The complete areas of health promotion activities and knowledge about the role of exercise in the management of diabetes were not covered in the phone conversation due to time limitations. Nonrespondents appeared to be very similar to respondents in the areas where information was gathered (Appendix 5, Figure A5-1).

In the original cover letter dated October 4, 1988 (Appendix 2), an incentive was offered to increase participation in the study. By enclosing a separate request (to maintain confidentiality of the instrument) with the completed survey instrument, the respondents were invited to request copies of educational materials on the subject of exercise and diabetes management. These materials (Appendix 4: Educational Materials) consisted of "Tips for the Diabetic Athlete" written by Nancy Clark, M.S., R.D. and a current list of References for Exercise and Diabetes Management compiled by the researcher. Forty-eight of the respondents took advantage of this offer. Copies of the education materials were mailed in December, 1988.

G. Data Analysis

All data were coded for analysis on one of the mainframe computers at the University of Tennessee Computing Center (UTCC). The IBM's CMS and Digital's VAX Cluster computers were used since they are recommended for this type of research involving a statistical package. The data analysis was done using SAS (90). Computer consultants from the UTCC assisted in writing the program for the analysis, which included primarily descriptive statistics such as frequency distribution, mean, mode, and rank order, in addition to Student's *t*-tests.

CHAPTER 4

RESULTS AND DISCUSSION

A. Introduction

The survey research project, Tennessee Dietitians' Counseling Practices Regarding the Role of Exercise in the Management of Non-insulin-dependent Diabetes, produced an 86% response rate (246 respondents). Several reasons (based on theory and experience in the field of survey design and implementation) can be identified which may account to a large degree for this excellent response.

1. The topic was of interest to the respondents.

Exercise/physical activity and other health promotion activities are current topics of interest to many people, dietetic professionals included. Diabetes is one of the most common disease states with which dietitians deal--and diet plays a critical role in its management. The survey instrument was attractive and was designed to flow logically and be easy to complete.

2. The survey was conducted by a peer for non-commercial purposes with the support of the state professional association. Efforts were made through several channels before mailing to inform TDA members of the purpose of the survey and the importance of response. Since 45% of the dietetic professionals

in the study possessed advanced degrees, there may have been some desire to assist a graduate student.

3. The roster of names/addresses was updated just prior to purchase, which minimized the number of respondents who were "lost" due to incorrect addresses.

As with most types of survey research, the respondents were free to omit specific questions and to skip groups of questions. Overall the response was good and most respondents completed almost all the questions; however, some respondents did not answer several questions. No pattern to the omissions could be established. These omissions account for the varying number of responses reported in the tables in this chapter.

The survey was designed to describe the counseling practices of dietitians who work with clients with NIDDM. The respondents were asked a variety of questions in 4 major categories: background/demographic information, counseling practices, knowledge about the role of exercise in diabetes, and health promotion activities. The next 4 sections of this chapter discuss the results of the study in each of these 4 areas. The study was also designed to test the difference in knowledge (about the role of exercise in diabetes management) and personal health promotion practices of the dietitians who provided counseling about exercise, compared to those who did not provide such counseling. Due to the unexpectedly small group ($n = 6$) of dietetic practitioners who did not include information about exercise during counseling sessions with clients with NIDDM, it was not possible to test 3 of the hypotheses identified in Chapter 1. Descriptive information about the results is provided in these cases.

B. Background/Demographic Information

The survey instrument provided a wealth of information about dietetic practitioners in the state of Tennessee. It furnished information on the age and educational background of the respondents, as well as the area of employment and the settings for counseling. Table 4-1 illustrates that slightly over half (53%) of the sample employed in dietetics (or 40% of the total population) regularly counsel clients with NIDDM. Dietitians employed in other areas in the field comprise 36% of the population, while 24% were not employed in the field of dietetics.

After examining the demographic and background information, the respondents were divided into 2 categories: those dietitians who regularly counseled and those who did not counsel clients with NIDDM. The group which did not counsel clients with NIDDM was composed of those dietitians who provided direct client care (but not to clients with NIDDM), those employed in administrative or other positions, and those not employed in the field of dietetics, i.e. the remainder of the pool of respondents. For ease of discussion, the 2 groups just identified will be referred to simply as counselors or noncounselors.

Only 6 of the 98 dietetic practitioners who counseled clients with NIDDM did not include information about the role of exercise in diabetes management. Therefore it was not possible to test the hypothesis described in Chapter 1 which dealt with whether or not inclusion of exercise information in counseling clients with NIDDM was affected by demographic variables. Information about these 6 counselors is presented in Appendix 5, Figure A5-2.

TABLE 4-1

Description of employment ($n = 246$ respondents)

Description	No.	%
Counsel clients with NIDDM	98	40
Employed in other areas in the field of dietetics	88	36
<i>Not</i> currently employed in the field of dietetics	60	24

The primary setting for counseling (of clients with NIDDM) for a clear majority (74%) of counselors was "*individually as an in-patient in a hospital or clinic*", as shown in Table 4-2. Twenty percent of the respondents indicated that their primary counseling setting was "*individually as an out-patient, including home visits*". Group and other settings were rarely used as a primary counseling setting though many respondents indicated that they were used as secondary settings.

The counselors' monthly caseloads of clients with NIDDM ranged from 1 to 200. To simplify presentation of the data, the caseloads were categorized into 5 groups: 1-4, 5-9, 10-14, 15-19, and > 20 clients per month as shown in Table 4-3. The mean monthly caseload of clients with NIDDM for all counselors was 11, when an extreme caseload of 200 was omitted. As suggested by the mean of 11 clients per month, the majority of counselors (75%) had caseloads of 14 or fewer clients. Only 13% of the respondents had caseloads of 20 or more clients per month, and of those 13 respondents, only 3 had monthly caseloads of more than 40 clients. (For additional information refer to Appendix 5, Table A5-1: "Respondents' Primary Counseling Setting by Monthly Caseload of Clients.")

As might be expected based on national population trends, a large proportion (45%) of dietitians in Tennessee is in the 30 - 39 years category as seen in Table 4-4. Although the relative percentages were small, there was some difference in the extremes of age categories between the counselors and the noncounselors. Six of the 7 respondents in the less than 25 years category counseled clients with NIDDM, whereas only 13 of 44 respondents (30%) in the 50 years or older category were counselors. There may be a trend for entry-level dietitians to secure positions where individual counseling is a primary responsibility, while older dietitians may have moved to administrative or other positions in the progression of their careers. Table 4-5 examines

TABLE 4-2

Settings for counseling of clients with NIDDM¹ (*n* = 98 respondents)

Setting	Primary setting		Secondary settings
	<i>no.</i>	<i>%²</i>	<i>no.</i>
<i>Individually as an in-patient in a hospital or clinic</i>	73	74	8
<i>In a group of in-patients in a hospital or clinic</i>	1	1	21
<i>Individually as an out-patient, including home visits</i>	20	20	35
<i>In a group in an out-patient setting</i>	0	0	21
<i>In a group in a community setting</i>	0	0	16
<i>Other</i>	4	4	1

¹Respondents could choose only one primary setting but as many secondary settings as were appropriate.

²Total is less than 100 due to rounding.

TABLE 4-3

**Monthly caseloads of clients with NIDDM
(*n* = 97 respondents)**

Caseload	No.	%	Mean ¹
1 - 4	30	31	3
5 - 9	21	22	6
10 - 14	21	22	11
15 - 19	12	12	16
≥20	13	13	35 ²

¹The mean NIDDM clients counseled per month was 11 with *n* = 96, when a caseload of 200 per month was omitted. The mode was 11. With *n* = 97, the mean was 13.

²Mean was calculated with *n* = 12; the extreme caseload of 200 per month was omitted, since only 3 respondents had monthly caseloads of more than 40 clients. With *n* = 13, the mean was 48.

TABLE 4-4

Age categories of respondents

Age	Counsel NIDDM clients <i>n</i> = 98		Do NOT counsel NIDDM clients ¹ <i>n</i> = 146		Entire population <i>n</i> = 244	
<i>years</i>	<i>no.</i>	(%) ²	<i>no.</i>	(%)	<i>no.</i>	(%) ²
<25	6	(6)	1	(1)	7	(3)
25 - 29	16	(16)	21	(14)	37	(15)
30 - 39	43	(44)	68	(47)	111	(45)
40 - 49	20	(20)	25	(17)	45	(18)
≥ 50	13	(13)	31	(21)	44	(18)

¹Group includes dietitians who provide direct client care (but not to persons with NIDDM), those employed in administrative or other positions, and those not employed in the field.

²Total is less than 100 due to rounding.

TABLE 4-5

Years of practice in the field of dietetics

Years	Counsel NIDDM clients <i>n</i> = 97		Do NOT counsel NIDDM clients ¹ <i>n</i> = 142		Entire population <i>n</i> = 239	
	<i>no.</i>	(%)	<i>no.</i>	(%)	<i>no.</i>	(%)
≤5	23	(24)	37	(26)	60	(25)
>5 - 10	29	(30)	38	(27)	67	(28)
>10 - 15	26	(27)	27	(19)	53	(22)
>15 - 20	8	(8)	18	(13)	26	(11)
≥ 20	11	(11)	22	(15)	33	(14)

¹Group includes dietitians who provide direct client care (but not to persons with NIDDM), those employed in administrative or other positions, and those not employed in the field.

the respondents' years of practice in the field of dietetics. There was a slight trend for the persons with the greatest years of experience to hold positions where they do not counsel clients with NIDDM.

The formal education of dietitians in Tennessee is quite impressive. Almost half of the respondents had completed advanced degrees at the master's or doctoral level (Table 4-6). All 8 of the dietitians with doctoral degrees were noncounselors, as might be expected, since the most common choice of positions would be in the areas of education and/or research for persons with this background.

The respondents' recency of education is shown in Table 4-7. Almost one-third (31%) of the respondents had completed their highest degree during the period 1981 to 1988, while over half (56%) had finished in the period 1976 to 1988. The largest single category of respondents (25%) was those who had completed their highest degree from 1976 to 1980, with another 21% completing their formal education before 1966. Only 2 time periods have a sizable difference when the counselors and noncounselors are compared. In the 1986-88 period, 21% of the counselors but only 11% of the noncounselors received their highest degree. In the category "before 1966," 16% of the counselors and 24% of the noncounselors completed their formal education. This information reinforces the premise presented earlier that there appears to be a trend for entry-level dietitians to secure positions where individual counseling is a primary responsibility, while older dietitians may have moved to administrative or other positions during the course of their careers.

The single largest employer of respondents in Tennessee (51%) was, as tradition would dictate, hospitals and/or clinics (Table 4-8). Almost two-thirds of the counselors and over one-third of the noncounselors stated that "hospitals/clinic" were their primary work setting. The second largest single work setting (12%) was in "community/public

TABLE 4-6

Formal education of respondents

Education	Counsel NIDDM clients <i>n</i> = 98		Do NOT counsel NIDDM clients ¹ <i>n</i> = 144		Entire population <i>n</i> = 242	
	<i>no.</i>	(%)	<i>no.</i>	(%)	<i>no.</i>	(%)
Bachelor's	58	(59)	74	(51)	132	(55)
Master's	40	(41)	62	(43)	102	(42)
Doctorate	0	(0)	8	(6)	8	(3)

¹Group includes dietitians who provide direct client care (but not to persons with NIDDM), those employed in administrative or other positions, and those not employed in the field.

TABLE 4-7

Recency of respondents' education¹

Year	Counsel NIDDM clients <i>n</i> = 98		Do NOT counsel NIDDM clients ² <i>n</i> = 147		Entire population <i>n</i> = 245	
	<i>no.</i>	(%) ³	<i>no.</i>	(%)	<i>no.</i>	(%)
1986 - 1988	21	(21)	16	(11)	37	(15)
1981 - 1985	15	(15)	25	(17)	40	(16)
1976 - 1980	23	(23)	38	(26)	61	(25)
1971 - 1975	15	(15)	26	(18)	41	(17)
1966 - 1970	8	(8)	6	(4)	14	(6)
before 1966	16	(16)	36	(24)	52	(21)

¹Data obtained from question D-4 on the survey instrument, "In what year was your highest degree obtained?"

²Group includes dietitians who provide direct client care (but not to persons with NIDDM), those employed in administrative or other positions, and those not employed in the field.

³Total is less than 100 due to rounding.

TABLE 4-8

Work settings of respondents

Setting	Counsel NIDDM clients <i>n</i> = 98		Do NOT counsel NIDDM clients ¹ <i>n</i> = 88		Entire population <i>n</i> = 186	
	<i>no.</i>	(%) ²	<i>no.</i>	(%)	<i>no.</i>	(%)
Medical or related school	3	(3)	3	(3)	6	(3)
Academic institution	1	(1)	6	(7)	7	(4)
Hospital/clinic	63	(64)	32	(36)	95	(51)
Food service management	0	(0)	6	(7)	6	(3)
Community/ public health	11	(11)	12	(14)	23	(12)
Private practice	7	(7)	2	(2)	9	(5)
Other	13	(13)	27	(31)	40	(22)

¹Group includes dietitians who provide direct client care (but not to persons with NIDDM), those employed in administrative or other positions, and those not employed in the field.

²Total is less than 100 due to rounding.

health." Twenty-two percent of respondents reported working in "other" settings, which included long-term care facilities, out-patient dialysis clinics, as well as other settings. As might be expected, almost all the respondents who reported working in an academic institution or in food service management were noncounselors.

The respondents were asked to report if they were diagnosed with diabetes mellitus and the results are presented in Table 4-9. Six (2.4%) of the respondents (half counselors and half noncounselors) reported such a diagnosis, which corresponds to the 2.5% of the American population estimated to have diabetes (2). Three other respondents indicated that they had been diagnosed with gestational diabetes.

A brief description is summarized below for the entire respondent population of 246, as well as for those classified as counselors or noncounselors. A majority of respondents employed in the field of dietetics were employed in a hospital or clinic. Almost half the respondents were between the ages of 30 and 39 years. Three-fourths of the respondents had 15 or less years of dietetic experience, while almost half held graduate degrees. The respondents' diagnosis of IDDM or NIDDM was similar to that of the American population.

Forty percent or 98 of the respondents indicated that they counseled clients with NIDDM and are simply referred to as counselors. The primary setting for this counseling was individually as an in-patient in hospitals or clinics with a mean caseload of 11 clients with NIDDM per month. The counselors were similar in age to the total population, though they had slightly less dietetic experience and slightly fewer graduate degrees (though more recently acquired) than did the sample as a whole.

Sixty percent of the sample were classified as noncounselors, because they did not counsel clients with NIDDM. Over half of the noncounselors were employed in other areas in the field of dietetics and the rest were not employed in the field at the time

TABLE 4-9

Respondents' diagnosis of diabetes mellitus

Diagnosis	Counsel NIDDM clients <i>n</i> = 98	Do NOT counsel NIDDM clients ¹ <i>n</i> = 147	Entire population <i>n</i> = 245
	<i>no.</i>	<i>no.</i>	<i>no.</i>
Type I or IDDM	2	2	4
Type II or NIDDM	1	1	2
Gestational diabetes	0	3	3
Total	3	6	9

¹Group includes dietitians who provide direct client care (but not to persons with NIDDM), those employed in administrative or other positions, and those not employed in the field.

of the survey. The noncounselors tended to be slightly older and to have slightly more dietetic experience than did the overall sample.

C. Counseling Practices

As indicated by the title of this research project, the purpose of the study was to determine Tennessee dietitians' counseling practices regarding the role of exercise in the management of non-insulin-dependent diabetes mellitus. The counseling practices which were of greatest interest were: whether or not exercise information for clients with NIDDM was provided by dietitians, how frequently it was provided, how much time was spent in the process, and what topics were discussed. In addition, the dietetic practitioners' reasons for including or excluding exercise information were examined.

1. Counselors' Inclusion of Exercise Information

As discussed earlier in this chapter (Table 4-1), 98 of the respondents reported that they regularly counseled clients with NIDDM. In order to answer Research Question 1 (p. 2), a question on the survey instrument was phrased: "Which one of the following methods do you most frequently use in giving exercise information to your Type II diabetic clients?" The results are presented in Table 4-10. Ninety-one of the 97 counselors reported using some form of education about exercise, which was quite surprising considering that dietitians in general have no formal training in exercise physiology. Over half (54%) of the counselors provided exercise information by oral explanation only. Only 30% provided the information more effectively by giving written information as well as an oral explanation. Only 6% of the counselors presented information about exercise in a form which included client participation. The remaining

TABLE 4-10

Methods of providing exercise information during counseling sessions with clients with NIDDM ($n = 97$ respondents)

Methods	No.	%
<i>Oral</i> explanation only	52	54
<i>Written</i> information only	0	0
<i>Written</i> information plus <i>oral</i> explanation	29	30
<i>Written</i> information, plus <i>oral</i> explanation plus <i>client participation</i>	6	6
<i>Other</i>	4	4
Do NOT include information on exercise	6	6

4% provided the exercise information in other forms. None of the respondents marked that they provided written information only. Only 6% of the respondents reported that they did not include information on exercise. For additional information, refer to Appendix 5, Table A5-2: "Respondents' Method of Providing Exercise Information by Monthly Caseload."

2. Frequency of Inclusion of Exercise Information

In an effort to determine how frequently dietitians are counseling people with NIDDM about the role of exercise in the management of diabetes, the following question was asked: "For how many of the last 5 ambulatory Type II diabetic clients you've counseled, did you incorporate information about the importance of exercise?" In answer to Research Question 2 (p. 2), Table 4-11, in agreement with Table 4-10, shows that 6% of the respondents counseled none of their last 5 clients about exercise. At the other end of the spectrum, 60% reported counseling all 5 clients about exercise. Progressively fewer respondents reported counseling 4 of the 5 clients about exercise (12%), 3 of the 5 (9%), 2 of the 5 (9%), and 1 of the 5 (5%). Reasons for excluding information about exercise in counseling clients with NIDDM will be discussed in greater depth later in this chapter.

3. Time Commitment for Counseling

Research Question 3 (p. 2) was answered when respondents reported the length of their counseling sessions and the amount of time in minutes spent discussing exercise. In an effort to summarize and present the information, counseling time blocks were created for both initial and follow-up sessions (Table 4-12 and Table 4-13). The average time spent in an initial counseling session with a client with NIDDM ranged

TABLE 4-11

Clients with NIDDM counseled about exercise¹ (*n* = 94 respondents)

Clients counseled	No.	% ²	Cumulative % ²
0	6	6	6
1	5	5	11
2	8	9	20
3	8	9	29
4	11	12	41
5	56	60	101

¹Data compiled from question A-13 on the survey instrument, "For how many of the last five ambulatory Type II diabetic clients you've counseled, did you incorporate information about the importance of exercise?"

²Total is greater than 100 due to rounding.

TABLE 4-12

Total counseling time and time spent counseling about the role of exercise: initial session for clients with NIDDM

Counseling time blocks	No. (%) <i>n</i> = 95	Mean counseling time <i>n</i> = 95	Mean exercise time <i>n</i> = 83	Mean TSS1 ¹ <i>n</i> = 83
<i>min</i>		<i>min</i>	<i>min</i>	%
≤29	6 (6)	19	5	24
30 - 44	26 (27)	31	5	17
45 - 59	15 (16)	46	7	15
60 - 74	32 (34)	60	7	12
75 - 89	6 (6)	75	9	12
≥90	10 (11)	93	9	10
Overall mean		52	7	14

¹TSS1 is the percentage of time in initial counseling session spent discussing exercise. Computed individually for each respondent by dividing the number of minutes spent providing exercise information by the number of minutes of the total initial counseling session, then multiplying the result by 100. The mean TSS1 scores in this table were compiled by averaging the individual TSS1 scores for the respondents in each of the six categories above.

TABLE 4-13

Total counseling time and time spent counseling about the role of exercise: follow-up sessions for clients with NIDDM

Counseling time blocks	No. (%) <i>n</i> = 88	Mean counseling time <i>n</i> = 88	Mean exercise time <i>n</i> = 80	Mean TSS2 ¹ <i>n</i> = 80	Mean follow- up sessions <i>n</i> = 86
<i>min</i>		<i>min</i>	<i>min</i>	%	<i>no.</i>
≤15	18 (20)	13	3	22	1
16 - 30	57 (65)	27	5	19	2
31 - 45	8 (9)	41	10	24	2
46 - 60	5 (6)	58	15	28	2
Overall mean		27	5	19	2

¹TSS2 is the percentage of time in follow-up counseling session spent discussing exercise. Computed individually for each respondent by dividing the number of minutes spent providing exercise information by the number of minutes of the total follow-up counseling session, then multiplying the result by 100. The mean TSS2 scores in this table were compiled by averaging the individual TSS2 scores for the respondents in each of the four categories above.

from 19 to 93 minutes, with an overall mean of 52 minutes. Over three-fourths (77%) of the counselors' initial sessions were in the 3 time blocks of 30 to 74 minutes, with the largest single group of counselors (34%) spending 60-74 minutes in the initial session. For all counselors, time spent during the initial session discussing exercise ranged from 1 to 15 minutes, and the overall mean was 7 minutes. Even though the actual length of the initial sessions ranged from 15 to 120 minutes, there was relatively little variation in the average time spent discussing exercise (5-9 minutes) in the 6 counseling time blocks.

In order to compare the time spent discussing exercise across the varied lengths of initial counseling sessions, a score called Time Spent Score 1 (TSS1) was created (Table 4-12). It is the percentage of time in an initial counseling session spent discussing exercise. It was computed individually for each respondent by dividing the number of minutes spent providing exercise information by the number of minutes of the total initial counseling session, then multiplying the result by 100. The mean TSS scores in Tables 4-12 and 4-13 were compiled by averaging the individual TSS scores for each of the respondents in the categories. The percentage of time spent discussing exercise during the initial counseling session with a client with NIDDM decreased as the length of time for the total session increased, with a high of 24% for sessions less than 30 minutes in length and a low of 10% for sessions of 1 1/2 hours or more. Since there are so many topics to discuss in an initial counseling session for a client with NIDDM, this result seems logical. For counselors who have such short initial counseling sessions, it is apparent that if they discuss exercise at all, it will probably consume a greater percentage of the session than it would for their peers who have more extended time frames. The mean TSS1, for the 83 counselors who provided enough information

to calculate the score, was 14%, which is a considerable segment of the session for an area in which dietitians have no formal training.

Dietitians reported an average of 2 follow-up counseling sessions for each client with NIDDM, ranging in length from 5 to 60 minutes. The mean length of the follow-up session was 27 minutes (Table 4-13). Dietetic practitioners have a tendency to spend a slightly greater percentage of time in follow-up sessions (19%) than they did in the initial session (14%) discussing exercise as indicated by the average Time Spent Score 2 (TSS2). The means of the TSS2 for the various time blocks of follow-up sessions ranged from 19 to 28%. The largest percentage of respondents (65%), those whose follow-up sessions lasted 16 to 30 minutes, spent the lowest percentage of counseling time (19%) discussing exercise.

4. Exercise-related Topics of Discussion

During the time that respondents spent discussing exercise with their clients with NIDDM, a variety of topics were included (Table 4-14). In order to answer Research Question 4, the topics listed on the survey instrument were rated by the respondents on a 5-point scale ranging from *never discussed* to *always discussed*. The 16 topics are listed in Table 4-14 in descending order by the total percentage of respondents who identified each topic as one *always* or *usually discussed*. As might be expected, the ranking of topics by total percentage of respondents marking *always* or *usually* parallels very closely the ranking by percentage of respondents marking only *always*. The 6 topics in Group 1 were ranked by 74% or more of the respondents as *always* or *usually discussed*. Seven additional topics in Group 2 were noted by 50% to 64% of the respondents as those *always* or *usually discussed*. The 3 topics in Group 3 were noted

TABLE 4-14

**Respondents' exercise-related topics of discussion during
counseling sessions with clients with NIDDM**

Topic ² , <i>n</i>	Response ¹				Total	
	<i>Always</i>		<i>Usually</i>			
	<i>no.</i>	<i>(%)</i>	<i>no.</i>	<i>(%)</i>	<i>no.</i>	<i>(%)</i>
Group 1						
•Weight management. <i>n</i> = 85	57	(67)	19	(22)	76	(89)
•Gradual introduction of exercise. <i>n</i> = 85	50	(59)	21	(25)	71	(84)
•Exercise's effect on blood glucose levels. <i>n</i> = 83	45	(54)	24	(29)	69	(83)
•Need for physician's recommendation/ approval. <i>n</i> = 86	47	(55)	23	(27)	70	(81) ³
•Appropriate snacking for increased activity/exercise. <i>n</i> = 85	32	(38)	36	(42)	68	(80)
•Frequency of exercise. <i>n</i> = 85	41	(48)	22	(26)	63	(74)
Group 2						
•Precautions for diabetic clients when exercising. <i>n</i> = 85	27	(32)	27	(32)	54	(64)
•Duration of exercise. <i>n</i> = 85	33	(39)	20	(24)	53	(62) ³
•Decreased need for insulin or oral hypoglycemic agent. <i>n</i> = 84	23	(27)	28	(33)	51	(61) ⁴
•Decreased risk of heart disease. <i>n</i> = 83	25	(30)	22	(27)	47	(57)
•Psychological benefits (improved sense of well-being, etc.) <i>n</i> = 85	29	(34)	19	(22)	48	(56)
•Types of exercise (examples of aerobic or flexibility exercises, etc.) <i>n</i> = 85	20	(24)	24	(28)	44	(52)
•Increased sensitivity to insulin. <i>n</i> = 82	17	(21)	24	(29)	41	(50)
Group 3						
•"Warm up" and "cool down" periods. <i>n</i> = 85	18	(21)	14	(16)	32	(38) ⁴
•Checking blood glucose before and after exercise. <i>n</i> = 84	15	(18)	14	(17)	29	(35)
•Intensity of exercise. <i>n</i> = 85	16	(19)	11	(13)	27	(32)

¹Data compiled from question A-19 on the survey instrument. "The phrases below are topics which may be covered by a dietitian discussing exercise with a Type II diabetic client. Please rate each topic on the frequency with which you discuss them in your counseling sessions. Circle 1 for a topic which is never discussed, 2 for one rarely discussed, 3 for sometimes discussed, 4 for usually discussed and 5 for always discussed."

²Topics are grouped in descending order by total percentage of *usually* or *always* responses.

³Total is less than the sum of the *always* and *usually* columns due to rounding.

⁴Total is greater than the sum of the *always* and *usually* columns due to rounding.

by a minority of respondents (32% to 38%) as ones *always* or *usually discussed* in counseling sessions.

Weight management was the topic most frequently identified as *always discussed* by 67% of the respondents. Eighty-nine percent of the respondents marked it as a topic *always* or *usually discussed*, which is logical since an estimated 80% of the people with NIDDM are overweight. The next 4 topics were rated similarly by the respondents as topics they *always* or *usually discussed*: **gradual introduction of exercise** (84%), **exercise's effect on blood glucose levels** (83%), **need for physician's recommendation/approval** (81%), and **appropriate snacking for increased activity/exercise** (80%). Nearly three-fourths (74%) of the respondents rated **frequency of exercise** as a topic they discussed *usually* or *always*.

The first 3 topics in Group 2 were similarly rated by the respondents as topics they *always* or *usually discussed*: **precautions for diabetic clients when exercising** (64%), **duration of exercise** (62%), and **decreased need for insulin or oral hypoglycemic agent** (61%). **Decreased risk of heart disease** was a topic *always* or *usually discussed* by only 57% of the respondents. This result was somewhat surprising considering the risk of heart disease and stroke is 2-3 times greater in the individual with diabetes than it is in the person without diabetes and that physical activity reduces the risk of coronary heart disease. **Psychological benefits** (56%), **types of exercise** (52%), and **increased sensitivity to insulin** (50%) were discussed *always* or *usually* by respondents in decreasing frequency.

Group 3 includes the 3 topics least frequently discussed by the respondents. **"Warm-up" and "cool down" periods** (38%) and **intensity of exercise** (32%) were discussed *always* or *usually* by less than 40% of the sample. The other topic in this category, **checking blood glucose before and after exercise**, is one of the

most commonly mentioned precautions in publications related to diabetes and exercise. However, it is mentioned *always* or *usually* by only 35% of the respondents. It seems that this important topic related to the safety of exercise for clients with NIDDM is being frequently overlooked by dietitians in Tennessee.

5. Reasons for Inclusion of Exercise Information

In answer to Research Question 5 (p. 2), Table 4-15 identifies the dietetic practitioners' reasons for including information about exercise in counseling sessions with clients with NIDDM. The respondents were asked to identify reasons based on a 3-point scale: *not important*, *somewhat important*, or *very important*. The responses are arranged in 3 groups in decreasing order of the percentage of respondents who marked the reason as *very important* in their decision to include information about exercise in their counseling sessions.

Over 80% of the respondents identified the 3 reasons listed in Group 1 as *very important*. Group 1 includes: **exercise is important in managing diabetes** (84%), **exercise decreases risk factors for other complications of diabetes such as obesity, hypertension, etc.**(83%), and **client requires weight loss** (81%). The remaining respondents, with only 1 exception, selected these 3 reasons as the *somewhat important* response. All 3 of these reasons are related to the concept that exercise can contribute to the overall health of the person with NIDDM. It seems reasonable that these reasons would influence such a large percentage of the respondents to discuss exercise.

In Group 2 two-thirds (67%) of the respondents selected the following reasons as *very important*: **exercise decreases risk factors for heart disease and health promotion is an important part of my job**. Respectively, 31% and 28%

TABLE 4-15

**Importance of reasons for including information about
exercise in counseling sessions with clients with NIDDM**

Reason ¹ , <i>n</i>	Response					
	<i>Not important</i>		<i>Somewhat important</i>		<i>Very important</i>	
	<i>no.</i>	<i>(%)</i>	<i>no.</i>	<i>(%)</i>	<i>no.</i>	<i>(%)</i>
Group 1						
Exercise is important in managing diabetes. <i>n</i> = 88	0	(0)	14	(16)	74	(84)
Exercise decreases risk factors for other complications of diabetes such as obesity, hypertension, etc. <i>n</i> = 88	1	(1)	14	(16)	73	(83)
Client requires weight loss. <i>n</i> = 89	0	(0)	17	(19)	72	(81)
Group 2						
Exercise decreases risk factors for heart disease. <i>n</i> = 88	2	(2)	27	(31)	59	(67)
Health promotion is an important part of my job. <i>n</i> = 86	4	(5)	24	(28)	58	(67)
Group 3						
Patient is interested in the subject of exercise. <i>n</i> = 87	15	(17)	37	(43)	35	(40)
Written educational materials are available. <i>n</i> = 84	31	(37)	37	(44)	16	(19)
I believe that many patients comply with recommendations for exercise. <i>n</i> = 86	26	(30)	46	(54)	14	(16)

¹Reasons are grouped in descending order by the percentage of responses marked *very important*.

selected these reasons as *somewhat important*. It would appear that the reason related to decreasing risk factors for heart disease should be categorized with the other reasons in Group 1 as something which contributes to the overall health of the person with NIDDM. The responses do not reflect this, however, which is consistent with the results presented earlier in Table 4-14 where only 57% of the respondents *usually* or *always* discuss the **role of exercise in decreasing the risk of heart disease** in counseling sessions.

Responses in Group 3 were quite varied. Almost equal numbers (43% and 40%) of respondents identified **patient is interested in the subject of exercise**, respectively, as a *somewhat* or *very important* reason for including exercise information when counseling clients with NIDDM. For 17% of respondents, however, the patient's interest in the subject did not influence their decision. In addition, the practitioner's belief that **many patients comply with recommendations for exercise** was cited by 54% as *somewhat important* and by 30% as *not important* in their reasons for including information about exercise in counseling sessions. The **availability of written educational materials** was *not important* as a reason to include exercise information for 37% of the respondents. A slightly larger percentage (44%) reported that it was *somewhat important*, while only 19% said it was *very important*.

In the initial stages of the research project, it was also theorized that the dietetic practitioner's supervisor might have a major influence on whether or not exercise information was included in the counseling sessions with clients with NIDDM. Table 4-16 clearly shows that the supervisor's influence is not a major factor. The majority of the respondents (64%) reported that "My supervisor neither encourages nor discourages me to give exercise information." No respondents reported slight or strong

TABLE 4-16

Supervisor's influence on inclusion of exercise information in counseling sessions with clients with NIDDM¹ (n = 98 respondents)

Influence	No.	% ²
Inclusion of information is <u>part of protocol</u> .	10	10
My supervisor <u>strongly encourages</u> inclusion of exercise information	8	8
My supervisor <u>slightly encourages</u> inclusion of exercise information.	7	7
My supervisor <u>neither encourages nor discourages</u> me to give exercise information.	63	64
My supervisor <u>slightly discourages</u> inclusion of exercise information	0	0
My supervisor <u>strongly discourages</u> inclusion of exercise information.	0	0
I have <u>no supervisor</u> or administrator.	10	10

¹Information gathered from question A-21 on the survey instrument: "Which one of the following phrases best describes your supervisor's (or administrator's) influence on whether or not you include information about exercise in your counseling of Type II diabetic individuals? Select only one."

²Total is less than 100 due to rounding.

discouragement from their supervisor for including exercise information, while 15% reported slight or strong encouragement to include exercise information. "Inclusion of information is part of protocol" was identified by 10% of the respondents, and 1 person wrote in the comment that she wrote the protocol. Ten percent reported that they have no supervisor or administrator. From this information, it would appear that dietetic practitioners have a great deal of freedom in the information they choose to include in their counseling sessions for clients with NIDDM.

6. Reasons for Exclusion of Exercise Information

Just as it was important to identify respondents' reasons for the inclusion of exercise information in counseling sessions with clients with NIDDM, it was important to determine their reasons for excluding this information. In answer to Research Question 6 (p. 2), Table 4-17 provides some explanation for why some of the respondents reported that they had counseled less than 5 of their last 5 NIDDM clients about the role of exercise in the management of diabetes. Five categories were created which group the practitioners' reasons for excluding information based on the responses across the 3-point scale: *very important*, *somewhat important*, or *not important*.

In Group 1 64% of the respondents identified **the client's medical problem which prohibits/restricts exercise** as a *very important* reason for excluding exercise information for obvious reasons. An additional 29% reported that it was *somewhat important*.

All 3 reasons in Group 2 were indicated by about three-fourths of the respondents as ones which were *somewhat* or *very important* reasons for excluding information about exercise in counseling sessions with clients with NIDDM. **Lack of knowledge of MD's recommendations regarding exercise** was cited as a *very*

TABLE 4-17

Importance of reasons for excluding information about exercise in counseling sessions with clients with NIDDM

Reason ¹ , <i>n</i>	Response					
	<i>Not Important</i>		<i>Somewhat Important</i>		<i>Very Important</i>	
	<i>no.</i>	<i>(%)</i>	<i>no.</i>	<i>(%)</i>	<i>no.</i>	<i>(%)</i>
Group 1						
Client's medical problem which prohibits/restricts exercise. <i>n</i> = 84	6	(7)	24	(29)	54	(64)
Group 2						
Lack of knowledge of MD's recommendations regarding exercise. <i>n</i> = 81	21	(26)	22	(27)	38	(47)
Lack of written educational materials about exercise. <i>n</i> = 82	18	(22)	32	(39)	32	(39)
Lack of time in counseling session to cover exercise. <i>n</i> = 83	19	(23)	33	(40)	31	(37)
Group 3						
Client's lack of interest in exercise. <i>n</i> = 84	24	(29)	36	(43)	24	(29)
Professional liability if client is harmed by exercise. <i>n</i> = 82	27	(33)	28	(34)	27	(33)
Another health care professional available to discuss exercise. <i>n</i> = 83	34	(41)	14	(17)	35	(42)
Group 4						
Lack of confidence in my knowledge about exercise. <i>n</i> = 81	34	(42)	36	(44)	11	(14)
Belief that diet-related knowledge is more important than exercise. <i>n</i> = 80	34	(43)	35	(44)	11	(14)
Client's noncompliance with exercise recommendations. <i>n</i> = 83	28	(34)	45	(54)	10	(12)
Client's limited access to exercise space/location. <i>n</i> = 84	31	(37)	38	(45)	15	(18)
Group 5						
Belief that information about exercise is NOT important. <i>n</i> = 77	71	(92)	5	(7)	1	(1)
Belief that it is NOT appropriate for a dietitian to discuss exercise. <i>n</i> = 80	54	(68)	19	(24)	7	(9)

¹Reasons are grouped by the range of responses across the 3-point scale; Group 1 contains the greatest percentage of *very important* responses, while Group 5 has the greatest percentage of *not important* responses.

important reason for excluding exercise information by 47% of the respondents. The remaining respondents were equally divided in their opinion of the same reason as *somewhat important* or *not important*. Each of the responses *somewhat important* and *very important* were marked by 39% of the respondents for **lack of written educational materials about exercise**. Table 4-15 showed that 44% of the respondents selected **written educational materials are available** as a *somewhat important* reason for including exercise information, while only 19% stated that it was a *very important* reason. The presence or absence of written educational materials does not appear to be a major determinant in whether or not exercise information is included in counseling sessions. The lack of use of such materials by over 50% of the respondents indicates that reinforcement of the exercise information, through the use of written materials, would be appropriate. **Lack of time in counseling session to cover exercise** was cited by 77% of the respondents as a reason for excluding the information, with a fairly even split between the 2 responses of *somewhat* and *very important*.

The responses to the 3 reasons in Group 3 were quite varied. In general, the first 2 reasons were fairly evenly distributed across the 3 responses. These reasons were: **client's lack of interest in exercise** and **professional liability if client is harmed by exercise**. Both extremes of the responses, *very important* and *not important* were equally represented by the reason **another health care professional available to discuss exercise**. Forty-two percent and 41% of the respondents, respectively, indicated that this reason was and was not a reason for excluding information about exercise.

In Group 4 in Table 4-17, the 4 reasons listed do not appear to be particularly important in a decision to exclude information about exercise. The first 2 reasons for

excluding information show an almost even split between the *not important* and *somewhat important* responses by 86-87% of the respondents. The dietetic practitioners neither appear to have a **lack of confidence in knowledge about exercise**, nor do they believe that **diet-related knowledge is more important than exercise**. The client's **noncompliance with exercise recommendations** is cited as a *somewhat important* reason for excluding exercise information by 54% of the respondents and *not important* by 34%. The client's **limited access to exercise space/location** was similarly cited as a *somewhat important* reason for excluding exercise information by 45% of the respondents and *not important* by 37%.

Responses to the phrases in Group 5 refute 2 reasons which were theorized to influence practitioners' counseling practices in the planning stages of the study. Only 8% of respondents indicated that a **belief that information about exercise is NOT important** was a *somewhat* or *very important* reason for excluding exercise information in their counseling sessions. **Belief that it is NOT appropriate for a dietitian to discuss exercise** was a reason cited as *very important* in the decision to exclude exercise information by only 9% of the respondents. Another 24% of the respondents identified this reason as *somewhat important* in their decision to exclude information. Opinions on these 2 reasons were expected to be much more divided and more controversial than the results indicated. Most dietitians believed that exercise information is important and that it is appropriate for dietitians to provide this information.

D. Knowledge

In an attempt to measure whether or not Tennessee dietitians were knowledgeable about the role of exercise in the management of diabetes, Section C of the survey instrument contained questions about this topic. In the original operational definitions in Chapter 1, knowledgeable was defined as the ability to answer correctly 16 or more of the 22 questions on the survey instrument about the importance of exercise and the role of exercise in diabetes as it relates to insulin requirement and dietary intake. The results provided the answer to Research Questions 7 (p. 4).

1. Knowledge Classification

Table 4-18 presents information on respondents who are classified as "knowledgeable" or "not knowledgeable." Of the population sample, 62% of all the respondents as well as the counselors were considered knowledgeable. It was anticipated that the dietitians who work with clients with NIDDM would be more knowledgeable than others in the field, but 61% of the noncounselors were considered knowledgeable as well. Based on the test in the survey instrument, the knowledge level of counselors (about the role of exercise in the management of diabetes mellitus) was not greater than it was for those dietitians working in other areas in the field or those not currently employed in the field of dietetics. (For related information, see Appendix 5, Table A5-3: "Knowledge classification by monthly caseload.")

Based on results reported previously, most dietitians in Tennessee believe that information about exercise is important and that it is appropriate for dietitians to provide this information to clients with NIDDM. However, they do not generally have any specialized training in the area of exercise physiology or physical education. In the

TABLE 4-18

**Respondents' knowledge of the role of exercise in the
management of NIDDM¹**

Subjects	<i>n</i>	No.	%
<u>Entire population</u>	239		
•Knowledgeable		147	62
•Not knowledgeable		92	38
<u>Counsel clients with NIDDM</u>	98		
•Knowledgeable		61	62
•Not knowledgeable		37	38
<u>Do not counsel clients with NIDDM²</u>	141		
•Knowledgeable		86	61
•Not knowledgeable		55	39

¹"Knowledgeable" subjects answered correctly 16 or more of 22 questions in Section C of the survey instrument regarding knowledge about the role of exercise in the management of NIDDM.

²Group includes dietitians who provide direct client care (but not to persons with NIDDM), those employed in administrative or other positions, and those not employed in the field.

knowledge section of the survey, there were 8 questions (C-3, C-5, C-8:part 6, C-9, C-10, C-11, Case B, and Case C) which were answered correctly by less than 70% of all the respondents. Six of those 8 questions were quite technical, requiring the recall of specific figures on, for example, the blood glucose level at which clients with NIDDM are advised against exercise (question C-9.) The 3 exercise-related topics discussed least frequently (Table 4-14) were also somewhat technical: checking blood glucose before and after exercise, "warm up" and "cool down" periods, and intensity of exercise. There appears to be an obvious need for continuing education of dietitians to address the more technical components of the relationship between exercise and the management of NIDDM.

2. Sources of Information

Respondents were asked to identify their sources of information about exercise physiology/physical education; the results are presented in Table 4-19. Clearly the largest single source of information for 81 of the 97 counselors and 83 of the 145 non-counselors was **reading exercise-related articles in professional journals.** **Workshops/seminars dealing with exercise** were also cited by 90 of the 242 respondents in the sample. **Continuing education credit from attending national/state meetings or by other means and college courses dealing with exercise physiology/physical education** were selected much less frequently than were the previous sources. The selection **none of the above** was only marked by 7 counselors, but 33 noncounselors. This information clearly has implications for planning for continuing education for dietetic practitioners interested in the area of exercise and its relation to diabetes management.

TABLE 4-19

**Respondents' sources of information about exercise
physiology/physical education¹**

Sources	Counsel NIDDM clients <i>n</i> = 97	Do NOT counsel NIDDM clients ² <i>n</i> = 145	Entire population <i>n</i> = 242
	<i>no.</i>	<i>no.</i>	<i>no.</i>
Professional reading	81	83	164
Workshops/ seminars	42	48	90
Continuing education credit	25	35	60
College courses	26	31	57
Other	11	10	21
None of the above	7	33	40

¹Frequency data is reported from question D-5 on the survey instrument: "It is important to know what type(s) of educational background you have in exercise (not necessarily related to diabetes.) Please check all below that apply."

²Group includes dietitians who provide direct client care (but not to persons with NIDDM), those employed in administrative or other positions, and those not employed in the field.

3. Relationship of Knowledge and Time Spent Counseling

Table 4-20 presents the results of testing the following hypothesis: Tennessee dietitians who are knowledgeable about the role of exercise in diabetes management do not provide longer counseling sessions in this area than do dietitians who are not knowledgeable. When the mean TSS1 values for the knowledgeable and not knowledgeable groups were compared in a 2-tailed *t*-test, there was a statistically significant difference in the means, with an alpha of .05. (The computed *t* value was 2.3282, while the reference *t* value was ± 1.7074 with 38 df (91).) The difference was not in the direction that might be expected. In the initial counseling session, the TSS1 for knowledgeable counselors was 12.1 ± 5.9 whereas for the not knowledgeable counselors it was 17.8 ± 12.8 . The mean values for the *actual* minutes spent on exercise (as compared to the *percentage* of time represented by the TSS) in the initial session and the length of the whole session for both the knowledgeable and not knowledgeable groups are below:

Not knowledgeable:

6 minute average discussing exercise
43 minute average initial counseling session

Knowledgeable:

7 minute average discussing exercise
57 minute average initial counseling session

The fact that the average actual time spent on exercise counseling varied little between the groups, while there was a 14 minute difference in the average length of the session, offers another explanation for the difference between the TSS1 values. The knowledgeable and not knowledgeable counselors may spend roughly similar amounts of time discussing exercise, but the percentage of time spent may be smaller for the knowledgeable counselors because the length of their initial counseling session was longer than that of the not knowledgeable counselors. The difference in the length of

TABLE 4-20

Knowledge classification and time spent counseling¹

Time Spent Scores ²	<i>n</i>	Mean $\pm$ SD	<i>t</i>
TSS1: Knowledgeable ³	52	12.1 $\pm$ 5.9*	2.3283
Not knowledgeable	31	17.8 $\pm$ 12.8	
TSS2: Knowledgeable	48	24.2 $\pm$ 28.0	-0.9926
Not knowledgeable	32	19.6 $\pm$ 12.4	

¹An asterisk (*) indicates a statistically significant difference in the means of the knowledge classifications, as determined by a two-tailed *t*-test with an alpha of .05 ($p = .0253$).

²TSS1 and TSS2 are the percentages of time in the initial and follow-up counseling sessions, respectively, spent discussing exercise.

³Knowledgeable respondents correctly answered 16 of the 22 questions in Section C of the survey instrument.

time of the entire session should be independent of the knowledgeable or not knowledgeable (about exercise) classification of the counselor.

When the mean TSS2 values for the knowledgeable and not knowledgeable groups were compared (Table 4-20), there was not a statistically significant difference between the TSS2 of 24.2 for the knowledgeable group and 19.6 for the not knowledgeable group. (The calculated t value was -0.9926 while the reference t value was ± 1.673 with 70 df (91).) The mean values for the *actual* minutes spent on exercise (as compared to the *percentage* of time represented by the TSS) in the follow-up session and the length of the whole session for both the knowledgeable and not knowledgeable groups are below:

Not knowledgeable:

4 minute average discussing exercise
22 minute average follow-up counseling session

Knowledgeable:

6 minute average discussing exercise
29 minute average follow-up counseling session

Again, the average length of the entire session was longer for the knowledgeable counselors than for the not knowledgeable group. The length of the follow-up session would be a major factor in influencing the TSS2, but should be independent of the knowledgeable/not knowledgeable classification.

However, one of the limitations of survey projects is that all the data is self-reported. Minutes were the unit of measurement requested in reporting the amount of time spent discussing exercise as well as the length of the counseling sessions. It is difficult to pinpoint the exact portion of an average counseling session devoted to any 1 topic. In addition, particularly in the case of the TSS2 for the knowledgeable counselors, the standard deviation was very large. Since the range of answers was so

wide, the mean is not a particularly good representation of the percentage of time spent discussing exercise in the follow-up counseling session. The mode for TSS2 for both the knowledgeable and not knowledgeable groups was 16.7. The implications for the results discussed above must be considered with these constraints in mind.

4. Relationship of Knowledge and Exercise-related Topics of Discussion

A second hypothesis tested was: Tennessee dietitians who are knowledgeable about the role of exercise in diabetes management present no more exercise-related topics of discussion in counseling sessions than do dietitians who are not knowledgeable. The results of testing this hypothesis are presented in Table 4-21. There was not a statistically significant difference (as determined by a 2-tailed *t*-test) in the number of exercise-related topics *usually or always discussed* during counseling sessions between the knowledgeable and the not knowledgeable groups of counselors. (The computed *t* value was -0.3201 while the reference *t* value was ± 1.6756 with 83 df (91).) While there appeared to be no difference in the number of exercise-related topics mentioned by the counselors, there was no information on the depth in which these topics were discussed. Based on Table 4-14, the 10 specific topics discussed did vary since 13 topics were mentioned as *usually or always discussed* by 50% or more of all counselors.

E. Health Promotion Activities

Another major factor identified which was believed to exert an influence on whether or not Tennessee dietitians incorporated information about exercise in

TABLE 4-21

Knowledge classification and number of exercise topics discussed in counseling sessions with clients with NIDDM¹

Knowledge classification ²	<i>n</i>	Mean ³ ± SD	<i>t</i>
Knowledgeable	53	10.1 ± 4.3	-0.3201
Not knowledgeable	32	9.7 ± 3.8	

¹The number of exercise-related topics discussed with each client with NIDDM was determined by the total number of topics *usually* or *always* discussed by each respondent. This information was compiled from the five point (*never* to *always* discussed) scale on question A-19 on the survey instrument.

²Knowledgeable respondents correctly answered 16 of the 22 questions in Section C of the survey instrument.

³There was not a statistically significant difference in the number of exercise-related topics discussed as determined by a two-tailed *t*-test with an alpha of .05 ($p = .7497$).

counseling patients with diabetes was their own personal health promotion activities, particularly the regularity with which they themselves exercised. These factors were assessed using Section B of the survey instrument. The null hypothesis stated:

Tennessee dietitians who counsel clients with NIDDM about the role of exercise in diabetes management participate in no more personal health promotion activities than do those dietitians who do not counsel about the role of exercise. As mentioned earlier in this chapter, it was not possible to test the hypothesis because of the small group ($n=6$) of counselors who did not provide exercise information to clients with NIDDM about exercise. However, considerable information about the health promotion activities of Tennessee dietitians is provided in the following sections.

1. Overall Health Promotion Activities

Ten personal health promotion activities related to smoking, blood pressure, body weight, dietary intake, physical activity, blood cholesterol, sleep, seat belts, and alcohol consumption were assessed. Not surprisingly 98% of the dietitians surveyed stated that they ate a variety of foods from each of the 4 food groups usually (three-fourths of the time), every day, or almost every day. Another 98% of the respondents reported that they had had their blood pressure checked on 1 or more times in the last 2 years. In regard to smoking, 91% had quit smoking or had never smoked. When asked how often they wear seat belts when riding or driving in a car, 86% reported every time or almost every time. Eighty-four percent of the respondents reported sleeping 7 or more hours during a 24-hour period. In regard to alcohol consumption on a single occasion, 73% reported they drank 1 drink or none at all. Blood cholesterol levels had been checked in the last 2 years by 73% of the respondents.

The findings were similar to the results published by Martin et al. (83) about Texas dietitians. Of the dietitians surveyed in Texas, 96% had their blood pressure checked every 2 years, 90% did not smoke, and 75% reported having 1 drink or less at "1 sitting." The other areas discussed above were not addressed in the Texas study. Dietitians in Tennessee, however, are much more health conscious than the average person according to national and state figures regarding smoking and using seat belts. In a 36-state survey by the Centers for Disease Control (CDC)(92), the overall average (24.7%) and the Tennessee average (30.0%) of those who smoke regularly was considerably larger than was the 9% of the respondents in this study who smoked. Only 14% of the Tennessee dietitians reported that they used seat belts *usually, sometimes, seldom, or never*. The 36-state survey reported 30.1% (32.5% in Tennessee) of respondents *sometimes, seldom, or do not use* seat belts.

Information was obtained on height, weight, frame size, and gender. The data were compared to the 1983 Metropolitan Life Insurance Height-Weight Tables (93). Then a determination was made for each subject as to his/her classification as underweight, overweight, or average weight. Respondents of average weight comprised 39% of the sample, while 30% were underweight, and the remaining 30% were overweight. Due to rounding, the total was less than 100%.

Using the same height-weight tables and self-reported data on height, weight, frame size, and gender, Martin et al. (83) reported 41% of their sample at average weight, 38% as underweight, and 21% as overweight. Based on these data, it would appear that there is a greater percentage of overweight dietitians in Tennessee than in Texas. However, the Texas study had a response rate of 53% and data were not included for subjects not involved in direct patient care; these factors may have influenced the findings. Other criteria for establishing obesity/overweight were used in

the CDC Study (92), and could not be used for comparison with the results of this study.

2. Exercise

All the respondents were asked to report their participation in physical activity or exercise and the results are presented in Table 4-22. Almost one-third (32%) of the respondents reported that they did not participate regularly in any form of exercise. A third (33%) of the respondents participate in aerobic exercise, where aerobic exercise was defined as the self-reported participation in an aerobic activity (for example aerobic exercise class, running, walking briskly, etc.) 1 or more times per week. The remaining 35% of the respondents reported participating in regular aerobic exercise when it was defined as participation in an aerobic activity for 21 or more minutes 3 or more times per week.

Somewhat similar results were obtained when the exercise habits of the counselors were examined. Slightly over a third (35%) of the counselors did not participate regularly in any form of exercise, while 29% participated in aerobic exercise. The remaining 37% participated in regular aerobic exercise. Of the noncounselors, 31% did not participate regularly in any form of exercise, over a third (36%) participated in aerobic exercise, and 34% participated in regular aerobic exercise.

In the study by Martin and associates (83), 54% of the Texas dietitians said they "exercise vigorously at least 3 times per week." Findings from a national study of Americans (94) showed that 34% of the female subjects reported that they were "involved in regular exercise." In the CDC survey (92), a sedentary lifestyle was defined as less than 3 20-minute sessions of leisure-time physical activity per week. Only 32.7% of all Tennesseans (33.4% of Tennessee women) reported that they did

TABLE 4-22

Respondents' participation in exercise

Respondents	<i>n</i>	No.	% ¹
<u>Entire population</u>	244		
<i>Don't participate</i> regularly in any form of exercise		79	32
Participate in <i>aerobic exercise</i> ²		80	33
Participate in <i>regular aerobic exercise</i> ³		85	35
<u>Counsel clients with NIDDM</u>	98		
<i>Don't participate</i> regularly in any form of exercise		34	35
Participate in <i>aerobic exercise</i> ²		28	29
Participate in <i>regular aerobic exercise</i> ³		36	37
<u>Do NOT counsel clients with NIDDM</u> ⁴	146		
<i>Don't participate</i> regularly in any form of exercise		45	31
Participate in <i>aerobic exercise</i> ²		53	36
Participate in <i>regular aerobic exercise</i> ³		48	33

¹Total may be greater than 100 due to rounding.

²Aerobic exercise is defined as the self-reported participation in an aerobic activity (for example aerobic exercise class, running, walking briskly, etc.) one or more times per week.

³Regular aerobic exercise is defined as the self-reported participation in an aerobic activity for three or more times per week for 21 or more minutes per period.

⁴Group includes dietitians who provide direct client care (but not to persons with NIDDM), those employed in administrative or other positions, and those not employed in the field.

not have a sedentary lifestyle. In the 36-state CDC survey, the median prevalence of a sedentary lifestyle was 58% (with 42% reportedly physically active (92).) Though a direct comparison of the results to the Texas or CDC studies was not appropriate (since the definitions of "aerobic exercise" and "regular aerobic exercise" in the Tennessee study were much more specific than the other studies), Tennessee dietitians were as physically active as other Tennesseans, but appeared to be less active than American women and Texas dietitians.

3. Classification of Health Promotion Activities

A distinction was made between the respondents who participated in 7 or more versus 6 or less of the health promotion activities in the manner generally considered "ideal." This division was established based on the practice of using 70% as the passing score on the ADA Commission on Dietetic Registration Examination through 1988. (Since that time, a different system using skill scores has been used to determine a passing score.) The entire population of respondents, counselors, and non-counselors were similarly divided between these 2 categories of health promotion activities as seen in Table 4-23. Seventy-six percent of all the respondents, as well as the noncounselors, participated in 7 or more health promotion practices, with a mean of 8 health promotion practices for both groups. Similarly, 77% of the counselors participated in 7 or more health promotion practices and the mean was also 8. The remaining 24% of the entire population and of the noncounselors practiced 6 or fewer health promotion activities, with a mean of 6 activities for each group. Twenty-three percent of the counselors practiced 6 or fewer health promotion practices, with a mean of 5 activities. So the majority of dietetic practitioners in the state of Tennessee did set a good example for

TABLE 4-23

Respondents' participation in health promotion activities¹

Respondents, <i>n</i>	Health promotion activities					
	≥7 of 10			≤6 of 10		
	<i>no.</i>	%	<i>mean</i>	<i>no.</i>	%	<i>mean</i>
Entire population, <i>n</i> = 245	186	76	8	59	24	6
Counsel clients with NIDDM, <i>n</i> = 98	75	77	8	23	23	5
Do NOT counsel clients with NIDDM ² , <i>n</i> = 147	111	76	8	36	24	6

¹Ten health promotion activities (related to smoking, blood pressure, body weight, dietary intake, physical activity, blood cholesterol, sleep, seat belts, and alcohol consumption) were assessed by Section B of the survey instrument.

²Group includes dietitians who provide direct client care (but not to persons with NIDDM), those employed in administrative or other positions, and those not employed in the field.

their clients and others in health promotion practices, though there was room for ,
improvement, particularly in the areas of decreased body weight and increased exercise.

CHAPTER 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

A. Summary

This study was designed to ascertain some of the counseling practices of Tennessee dietitians who work with clients with non-insulin-dependent diabetes mellitus. Counseling practices surveyed included: overall amount of time spent counseling clients with NIDDM, frequency with which dietitians counsel about exercise, portion of the counseling time spent discussing exercise, exercise-related topics discussed, and reasons for including/excluding exercise information. Questions about personal health promotion activities, knowledge about the role of exercise in diabetes mellitus, and demographic information were asked in an effort to gain a picture of some factors related to whether or not the counselors included information about exercise in their counseling sessions with clients with NIDDM.

The survey was conducted on a random sample of 286 dietitians from the Tennessee Dietetic Association (TDA) mailing list. A response rate of 86% was achieved through the cooperation of 246 respondents. Due to this high response rate, considerable confidence can be expressed that the results of this study are indeed representative of dietitians in the state of Tennessee in the fall of 1988. Due to regional differences, economic factors, etc. the results of this study may not be generalized to the

entire nation, although it will hopefully provide information to stimulate research in other parts of the country.

As with any research project, there were limitations to the study. These limitations relate to the fact that all data collected were self-reported. Respondents were asked to estimate lengths of counseling sessions, etc; some respondents were probably able to make more accurate projections than were others. In addition, the respondents could choose to omit any questions they desired.

1. Demographic Information

The demographic and other background information gathered is an important component of the study. A majority of respondents in the field of dietetics were employed in a hospital or clinic. A large percentage (45%) were in the 30-39 year category with a much smaller percentage (18%) in the under 30 years category. Three-fourths of the respondents had 15 or less years of dietetic experience, while almost half held graduate degrees. The percentage of respondents diagnosed with IDDM or NIDDM was similar to that of the American population.

Forty percent or 98 of the respondents indicated that they counseled clients with NIDDM and were referred to as counselors. The counselors were similar in age to the total population, though they had slightly less dietetic experience and slightly fewer graduate degrees (though more recently acquired) than did the noncounselors.

Sixty percent of the sample was classified as noncounselors. Over half of this group was employed in other areas in the field of dietetics and the remainder were not employed in the field at the time of the survey. There was a slight trend for persons with over 15 years of experience to hold positions where they were not involved in counseling clients with NIDDM.

2. Counseling Practices

The most unexpected finding of the study dealt with the number of counselors of clients with NIDDM who provided information about exercise in their counseling sessions. In 2 questions on the survey instrument, 94% of the counselors indicated they provided exercise information to some or all of their clients with NIDDM. This figure is in great contrast to the 25-50% predicted based on estimates by local clinical and community dietitians and national diabetes specialists.

The primary setting for exercise counseling of clients with NIDDM was "individually as an in-patient." In providing information about exercise, the method used by over half the respondents was oral information only. The dietitians' mean caseload of clients with NIDDM was 11 per month.

Since information on the average length of dietitians' counseling sessions was not available from other sources, the study provided information in this regard. The mean time spent in an initial session counseling clients with NIDDM was 52 minutes, with over three-fourths of the counselors' sessions in the range of 30 to 60 minutes. The mean time spent discussing exercise during this session was 7 minutes. There was relatively little variation in the actual time spent discussing exercise, though the initial counseling sessions ranged from 15 to 120 minutes in length. The Time Spent Score for the initial session (TSS1) was the percentage of counseling time spent discussing exercise. The overall mean TSS1 score was 14.

On the average, respondents reported 2 follow-up counseling sessions for each client with NIDDM, with a mean length of 27 minutes. The length of the exercise component of the session averaged 5 minutes. In follow-up sessions, dietitians had a tendency to spend a greater percentage of their time discussing exercise (Time Spent Score 2 = 19) than they did in the initial session.

During counseling sessions with clients with NIDDM, a variety of exercise-related topics were included by dietetic practitioners. Respondents were asked to rate 16 topics on a 5-point scale ranging from *never discussed* to *always discussed*. Six topics were rated by almost three-fourths of the respondents as ones they *always* or *usually discussed* when counseling clients with NIDDM:

- weight management
- gradual introduction of exercise
- exercise's effect on blood glucose levels
- need for physician's recommendation/approval
- appropriate snacking for increased activity/exercise
- frequency of exercise.

Checking blood glucose before and after exercise is one of the most commonly mentioned precautions in publications related to diabetes and exercise. Yet less than one-fifth of Tennessee dietitians discussed this safety topic with their clients with NIDDM.

Respondents identified reasons for **including** information about exercise in counseling sessions with clients with NIDDM. When rated on a 3-point scale: *not important, somewhat important, or very important*, over three-fourths of the respondents identified the following 3 reasons as *very important*:

- Exercise is important in managing diabetes.
- Exercise decreases risk factors for other complications of diabetes such as obesity, hypertension, etc.
- Client requires weight loss.

Two-thirds of the respondents selected the following 2 reasons as *very important*:

- Exercise decreases risk factors for heart disease.
- Health promotion is an important part of my job.

The dietetic practitioner's supervisor had little effect on whether or not exercise information was provided.

Respondents identified reasons for **excluding** information about exercise in counseling sessions with clients with NIDDM. When rated on a 3-point scale: *not*

important, somewhat important, or very important, almost two-thirds of the respondents, for obvious reasons, identified **the client's medical problem which prohibits/restricts exercise** as a *very important* reason to exclude exercise information. Ten other *very important* reasons for excluding exercise information were identified by a range of 18 to 47% of the respondents. Only 1% and 9% of the respondents, respectively, identified a **belief that information about exercise is NOT important** and a **belief that it is NOT appropriate for a dietitian to discuss exercise** as *very important* reasons to exclude exercise information.

3. Knowledge

Questions about exercise on the survey instrument were used to measure the respondents' knowledge of the importance and role of exercise in diabetes management as it relates to insulin requirement and dietary intake. Respondents classified as knowledgeable were able to answer correctly 16 or more of 22 questions in Section C of the survey instrument. In general the percentage of respondents who were considered knowledgeable was low: 62% of the counselors and 61% of the noncounselors. The largest single source of information for counselors and noncounselors was **reading exercise-related articles in professional journals**.

There was a statistically significant difference in the means of the TSS1 scores of the knowledgeable and not knowledgeable counselors. Thus the null hypothesis could be rejected, i.e. Tennessee dietitians who are knowledgeable about the role of exercise in diabetes management do not provide longer counseling sessions in this area than do dietitians who are not knowledgeable. The difference was not in the direction that might be expected; the counselors categorized as not knowledgeable spent a greater percentage of their initial counseling session discussing exercise-related topics than did

the counselors categorized as knowledgeable. Both knowledgeable and not knowledgeable counselors *usually or always discussed* an average of 10 of 16 listed exercise-related topics in an initial counseling session.

There was not a statistically significant difference between the mean TSS2 scores for the knowledgeable and the not knowledgeable groups, even though the knowledgeable counselors spent an average of almost 5% longer discussing exercise information in the follow-up sessions than did the not knowledgeable counselors. Again, the average length of the entire follow-up session was longer for the knowledgeable counselors than for the not knowledgeable group.

4. Health Promotion Activities

Ten personal health promotion activities were assessed related to smoking, blood pressure, body weight, dietary intake, physical activity, blood cholesterol, sleep, seat belts, and alcohol consumption. Roughly three-fourths or more of the respondents participated in the following 7 activities in a manner considered "ideal:" eating a variety of foods, checking blood pressure, not smoking, using seat belts, getting enough sleep, limiting alcohol consumption, and checking blood cholesterol levels. While about 40% of the respondents were classified as average weight (based on the Metropolitan Life Insurance Tables of Desirable Weights), the remainder were equally divided between underweight and overweight.

Special attention was given to the respondents' participation in physical activity/exercise. There were only slight differences in the counselors' and noncounselors' participation in exercise. Slightly over a third of the counselors did not participate regularly in any form of exercise, slightly less than a third participated in

aerobic exercise in some form, and more than a third participated in regular aerobic exercise.

In drawing an overall picture of the respondents' personal health promotion activities, a distinction was made between the respondents who participated in 7 or more of the activities in the manner generally considered "ideal", and the respondents who participated in 6 or fewer in an "ideal" manner. Roughly three-fourths of both counselors and noncounselors participated in 7 or more of the health promotion practices in an "ideal" manner, with an average of 8 practices.

B. Conclusions

- 1. The vast majority of dietitians in Tennessee counsel clients with NIDDM about the role of exercise in diabetes management. These practitioners believe exercise information is important to include in the counseling session and that it is appropriate for a dietitian to discuss exercise with clients with NIDDM.**
- 2. Counseling about the role of exercise in NIDDM is commonly provided by dietitians, though the average monthly caseloads indicate that "specialization" in diabetes care is not commonly practiced in Tennessee.**
- 3. Tennessee dietitians' knowledge base is weak regarding the role of exercise in the management of NIDDM.**
- 4. Dietitians in Tennessee are "setting an example" for living a healthy lifestyle as indicated by the number of practitioners**

who participate regularly in health promotion activities, though there is room for improvement in the areas of weight reduction and increased physical activity.

C. Recommendations

1. There is a need for continuing education for dietitians at the local, state, and national levels about the role of exercise in the management of NIDDM.
2. Formalized instruction in exercise physiology, both in general terms, and as it relates to disease states should be included in undergraduate and graduate curriculums related to dietetics. Students should be able to read and comprehend the relevant scientific literature and relate it to general exercise recommendations provided to their clients.
3. Since most dietitians in Tennessee do provide information on the role of exercise in diabetes management, the development of written client educational materials about the subject is needed. Emphasis should be placed on the encouragement of client involvement in the counseling session.
4. The information related to age, years in dietetic practice, the number of graduate degrees, and place of employment should be used by colleges and universities in Tennessee, as well as TDA and its district affiliates in their long range

planning for student/career recruitment. (This is particularly important since almost half of the current dietitians in Tennessee are in the 30-39 year age range.) Other demographic information may be useful to the state or district dietetic associations for planning purposes, as well as for comparison to national figures.

5. There is a need for further research in the state, as well as nationally, about the content of the exercise segment of the counseling session with the client with NIDDM and an attempt to determine the level of compliance with recommendations regarding exercise.

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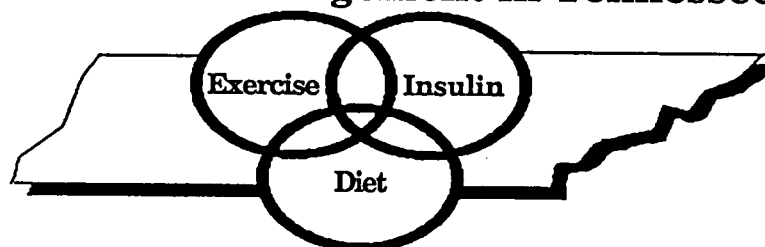
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APPENDIXES

Appendix 1
Survey Instrument

(1-3)

Diabetes Management in Tennessee



SECTION A: QUESTIONS about COUNSELING PRACTICES

These questions are designed to determine how often you counsel Type II (non-insulin dependent or adult-onset) diabetic clients and the extent of information you provide about the role and importance of exercise. Please fill in the blank or check only one answer unless otherwise indicated. Ignore the numbers in parentheses in the left margin since they are for data coding purposes only.

- (4) A-1 Are you currently employed in the field of dietetics?
 ___ 1. Yes
 ___ 2. No **IF NO:** Your answers to the other questions are still important.
 Please skip to Section B: Health Promotion
 Activities on p. 6 and complete the rest of the
 questionnaire.
- (5-6) A-2 How many hours per week are you employed?
 _____ Hours
- (7-8) A-3 How long have you been in this position?
 _____ Years
- (9) A-4 What is your primary work setting? (Check only one answer.)
 ___ 1. Medical school or other medical-related professional school
 ___ 2. University/college or other academic institution
 ___ 3. Hospital/clinic
 ___ 4. Food service management (schools, industrial setting, etc.)
 ___ 5. Community setting or public health
 ___ 6. Private practice
 ___ 7. Other (please specify) _____
- (10-11) A-5 Are you involved in direct patient/client care for 10% or more of your work time?
 ___ 1. Yes
 ___ 2. No **IF NO:** Please note your principal activity (for example,
 administration, research, education, etc.) below:

 Your answers to the other questions are still important.
 Please skip to Section B: Health Promotion
 Activities on p. 6 and complete the rest of
 the questionnaire.

2

- (12) A-6 Do you counsel/educate Type II diabetic clients either individually or in a group?
- _____ 1. Yes
 _____ 2. No IF NO: Please skip to Section B: Health Promotion Activities on p. 6 and complete the rest of the questionnaire.

- (13-19) A-7 Of the following choices, which is the primary setting in which you counsel or educate Type II diabetic clients? In what other settings do you counsel clients? (Please check one choice in the primary setting column below. Check as many "other" settings as are appropriate.)

Primary Setting	Other Settings	
_____	_____	1. Individually as an in-patient in a hospital or clinic
_____	_____	2. In a group of in-patients in hospital or clinic
_____	_____	3. Individually as an out-patient, include home visits
_____	_____	4. In a group in an out-patient setting
_____	_____	5. In a group in a community setting
_____	_____	6. Other (please specify) _____

The next seven questions concern individual counseling of Type II diabetic clients. If you do NOT counsel Type II diabetic clients individually, please skip to the instructions preceeding Question A-15 on p. 3.

- (20-21) A-8 How many Type II diabetic clients do you counsel individually in a month's time? (Please put a specific number, not a range and include those Type II diabetic clients with other dietary modifications.)
- _____ Type II diabetic clients per month
- (22-23) A-9 How long is each initial individual counseling session with a newly diagnosed Type II diabetic client? Please put a specific number of minutes, not a range. (Note: Consider a "new" diagnosis as one made in the last 6 months.)
- _____ Minutes per initial session
- (24-25) A-10 How long is each follow-up individual counseling session for a previously diagnosed Type II diabetic client? (Please put a specific number of minutes, not a range.)
- _____ Minutes per follow-up session

- (26-27) A-11 How many follow-up counseling sessions do you usually have with each client?
 _____ (average) follow-up sessions per client
- (28-31) A-12 Estimate the average amount of time you spend discussing exercise in the initial and follow-up counseling sessions? (Please put a specific number of minutes, not a range.)
 _____ Minutes (average) discussing exercise during the initial counseling session
 _____ Minutes (average) discussing exercise during the follow-up session
- (32) A-13 For how many of the last five ambulatory Type II diabetic clients you've counseled, did you incorporate information about the importance of exercise?
 _____ of the last 5 Type II diabetic clients.
- (33) A-14 Which one of the following methods do you most frequently use in giving exercise information to your Type II diabetic clients?
 _____ 1. Oral explanation only
 _____ 2. Written information only
 _____ 3. Written information plus oral explanation
 _____ 4. Written information plus oral explanation plus client participation (i.e. contract, goal setting, formal commitment to program, etc.)
 _____ 5. Other (please specify) _____
 _____ 6. Do not include information on exercise

If you do NOT teach/lead group classes for Type II diabetic clients, please skip to the instructions preceeding Question A-19 on p. 4.

- (34-35) A-15 Approximately how many times per year do you teach/lead group classes for Type II diabetic clients?
 _____ Times per year
- (36) A-16 Do you usually include information about exercise in your presentation?
 _____ 1. Yes
 _____ 2. No
- (37) A-17 If your class or presentation is part of a series, is information about exercise included in other classes?
 _____ 1. Yes
 _____ 2. No
 _____ 3. The classes I teach are not in a series or a part of another program.
- (38-41) A-18 What percentage of total class time is devoted to exercise discussion? Complete either or both the blanks below.
 _____ Percent of total class time about exercise IF a single class
 _____ Percent of total class time about exercise IF a series of classes

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If you do NOT include information about exercise when counseling or educating Type II diabetic clients, please skip the next two questions and go to question A-21 on p. 5.

A-19

The phrases below are topics which may be covered by a dietitian discussing exercise with a Type II diabetic client. Please rate each of the topics on the frequency with which you discuss them in your counseling sessions. Circle 1 for a topic which is never discussed, 2 for one rarely discussed, 3 for sometimes discussed, 4 for usually discussed and 5 for always discussed.

		Frequency of Discussion				
		Never	Rarely	Sometimes	Usually	Always
(42)	1. Precautions for diabetic clients when exercising	1	2	3	4	5
(43)	2. Need for physician's recommendation/approval	1	2	3	4	5
(44)	3. Checking blood glucose before & after exercise	1	2	3	4	5
(45)	4. Gradual introduction of exercise	1	2	3	4	5
(46)	5. Appropriate snacking for increased activity/exercise	1	2	3	4	5
(47)	6. Exercise's effect on blood glucose level	1	2	3	4	5
(48)	7. Increased sensitivity to insulin	1	2	3	4	5
(49)	8. Decreased need for insulin or oral hypoglycemic agent	1	2	3	4	5
(50)	9. Decreased risk of heart disease	1	2	3	4	5
(51)	10. Weight management	1	2	3	4	5
(52)	11. Psychological benefits (improved sense of well-being, etc.)	1	2	3	4	5
(53)	12. Frequency of exercise	1	2	3	4	5
(54)	13. Intensity of exercise (target heart rate)	1	2	3	4	5
(55)	14. Duration of exercise	1	2	3	4	5
(56)	15. "Warm up" and "cool down" periods	1	2	3	4	5
(57)	16. Types of exercise (examples of aerobic activity, flexibility exercises, etc.)	1	2	3	4	5
(58)	17. Other, please specify _____	1	2	3	4	5

- A-20 We want to know why dietitians provide information about exercise when counseling Type II diabetic clients. The sentences below are possible reasons. Please rank each of the reasons on its usual importance in your decision to include information about exercise in counseling. Please add any other reasons in the spaces in #9 and #10. Circle 1 to indicate a reason which is not important, 2 for a reason which is somewhat important, and 3 for a very important reason.

		<u>Importance of Reason for Including Information on Exercise</u>		
		<u>Not</u> Important	<u>Somewhat</u> Important	<u>Very</u> Important
(59)	1. Exercise is important in managing diabetes.	1	2	3
(60)	2. Exercise decreases risk factors for heart disease.	1	2	3
(61)	3. Exercise decreases risk factors for other complications of diabetes such as obesity, hypertension, etc.	1	2	3
(62)	4. Client requires weight loss.	1	2	3
(63)	5. Written educational materials about exercise are available.	1	2	3
(64)	6. Patient is interested in the subject of exercise.	1	2	3
(65)	7. I believe that many patients comply with recommendations for exercise.	1	2	3
(66)	8. Health promotion is an important part of my job.	1	2	3
(67)	9. Other, please specify _____	1	2	3
(68)	10. Other, please specify _____	1	2	3

- (69) A-21 Which one of the following phrases best describes your supervisor's (or administrator's) influence on whether or not you include information about exercise in your counseling of Type II diabetic individuals? Select only one.

- _____ 1. Inclusion of information about exercise is part of protocol.
- _____ 2. My supervisor strongly encourages inclusion of exercise information.
- _____ 3. My supervisor slightly encourages inclusion of exercise information.
- _____ 4. My supervisor neither encourages nor discourages me to give exercise information.
- _____ 5. My supervisor slightly discourages inclusion of exercise information.
- _____ 6. My supervisor strongly discourages inclusion of exercise information.
- _____ 7. I have no supervisor or administrator.

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- A-22 We want to know why dietitians do not provide information about exercise when counseling some or all Type II diabetic clients. The phrases below are possible reasons. Please rank each of the reasons on its usual importance in your decision to exclude information about exercise in some or all counseling sessions. Circle 1 to indicate a reason which is not important, 2 for a reason which is somewhat important, and 3 for a very important reason.

		<u>Importance of Reason for</u> <u>Excluding Information on Exercise</u>		
		Not Important	Somewhat Important	Very Important
(1)	1. Lack of confidence in my knowledge about exercise	1	2	3
(2)	2. Lack of time in counseling session to cover exercise	1	2	3
(3)	3. Lack of written educational materials about exercise	1	2	3
(4)	4. Belief that information about exercise is NOT important	1	2	3
(5)	5. Belief that diet-related knowledge is more important than exercise	1	2	3
(6)	6. Belief that it is NOT appropriate for a dietitian to discuss exercise	1	2	3
(7)	7. Client's lack of interest in exercise	1	2	3
(8)	8. Client's noncompliance with exercise recommendations	1	2	3
(9)	9. Client's limited access to exercise space/location	1	2	3
(10)	10. Client's medical problem which prohibits/restricts exercise	1	2	3
(11)	11. Professional liability if client is harmed by exercise	1	2	3
(12)	12. Lack of knowledge of M.D.'s recommendations regarding exercise	1	2	3
(13)	13. Another health care professional available to discuss exercise	1	2	3
(14)	14. Other (please specify) _____	1	2	3

SECTION B: QUESTIONS about HEALTH PROMOTION ACTIVITIES This section will enable us to compare Tennessee dietitians to other groups in terms of personal health promotion activities. Please fill in the blank or check only one answer for each question, unless otherwise indicated.

- (15) B-1 Do you smoke cigarettes?
- _____ 1. Yes
- _____ 2. I have quit smoking.
- _____ 3. I have never smoked.
- (16) B-2 How often do you wear seat belts when you drive or ride in a car?
- _____ 1. Every time or almost every time
- _____ 2. Usually--about three fourths of the time
- _____ 3. Sometimes--about half the time
- _____ 4. Seldom--about one fourth of the time
- _____ 5. Never or almost never

- (17) B-3 How frequently have you checked your blood pressure or had it checked in the last two years?
- _____ 1. Not at all
 _____ 2. Once
 _____ 3. Twice
 _____ 4. Three times
 _____ 5. Four or more times
- (18-19) B-4 How many hours do you usually sleep in a 24 hour period? Please put a specific number, not a range.
- _____ Hours
- (20) B-5 How often do you eat a variety of foods from each of the four food groups?
- _____ 1. Every day or almost every day
 _____ 2. Usually--about three fourths of the time
 _____ 3. Sometimes--about half the time
 _____ 4. Seldom--about one fourth of the time
 _____ 5. Never or almost never
- (21) B-6 What is the average number of alcoholic drinks you consume on a single occasion?
- _____ 1. I don't drink alcohol.
 _____ 2. 1 drink
 _____ 3. 2 drinks
 _____ 4. 3 or more drinks
- (22-25) B-7 Have you had your blood cholesterol checked in the last two years?
- _____ 1. Yes IF YES: What was your last total
 blood cholesterol level?
 _____ mg/dl
- _____ 2. No
- (26-32) B-8 Please complete:
1. Height (with one inch heels): _____ ft. _____ in.
 2. Weight: (fully dressed) _____ lbs.
 3. Frame size: Small _____ Medium _____ Large _____
 4. Gender: Male _____ Female _____
- (33) B-9 Do you usually engage in vigorous exercise one or more times per week, when vigorous exercise is defined as aerobic activity, for example aerobic exercise class, running, walking briskly, etc.?
- _____ 1. Yes
 _____ 2. No IF NO: Please skip to SECTION C: EXERCISE
 on p. 9 and complete the rest of the
 questionnaire.

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- (34) B-10 How many times per week do you usually participate in some form of vigorous exercise?
- _____ 1. 1-2 times
 _____ 2. 3-4 times
 _____ 3. 5-6 times
 _____ 4. 7 times
- (35) B-11 On the average, how long is each session of vigorous exercise?
- _____ 1. 10 minutes or less
 _____ 2. 11-20 minutes
 _____ 3. 21-40 minutes
 _____ 4. 41-60 minutes
 _____ 5. Over one hour
- (36) B-12 Do you measure your heart rate during this period of exercise?
- _____ 1. Yes
 _____ 2. No
- (37) B-13 How frequently do you exercise in your target heart rate range?
- _____ 1. Every time or almost every period of exercise
 _____ 2. Usually--about three fourths of the time
 _____ 3. Sometimes--about half the time
 _____ 4. Seldom--about one fourth of the time
 _____ 5. Never or almost never
 _____ 6. Don't know
 _____ 7. Don't measure heart rate
- (38-48) B-14 What primary form does your regular exercise usually take? Please check only one primary form. Check any other form(s) of exercise in which you participate frequently.
- | Primary
Form | Other
Forms | |
|-----------------|----------------|--|
| _____ | _____ | 1. Running/jogging |
| _____ | _____ | 2. Walking |
| _____ | _____ | 3. Swimming |
| _____ | _____ | 4. Cycling (stationary or moving) |
| _____ | _____ | 5. Rowing |
| _____ | _____ | 6. Aerobic exercise/dance class |
| _____ | _____ | 7. Aerobic exercise to music/tape/video at home |
| _____ | _____ | 8. "Working out" at a gym/fitness center with weight equipment |
| _____ | _____ | 9. Racquet sports, (tennis, racquetball, etc.) |
| _____ | _____ | 10. Other, please specify _____ |
- (49) B-15 How frequently do you spend time at the beginning of your exercise period "warming up" and time at the end "cooling down?"
- _____ 1. Every time or almost every time
 _____ 2. Usually--about three fourths of the time
 _____ 3. Sometimes--half the time
 _____ 4. Seldom--about one fourth of the time
 _____ 5. Never or almost never

SECTION C: QUESTIONS about EXERCISE

Although many dietitians have received no formal training in exercise physiology, it is important to determine dietitians' background in the areas of exercise as well as exercise as it relates to diabetes. Probably only dietitians who have specifically studied exercise and diabetes will be familiar with all the information, but we need everyone to complete this section. Rely on your current knowledge and please don't use references. Check only one response for each question unless otherwise indicated.

- (50) C-1 Components of a well-balanced program of exercise include:
____ 1. Aerobic activity
____ 2. Muscular strengthening exercises.
____ 3. Flexibility exercises.
____ 4. All of the above.
- (51) C-2 For optimal cardiovascular benefit, the number of times per week exercise is recommended for the average healthy adult is:
____ 1. 1-2 times per week.
____ 2. 3-5 times per week.
____ 3. 6-7 times per week.
- (52) C-3 In a program of physical activity where weight loss is the primary goal, the number of times exercise is recommended for maximal benefit is:
____ 1. 1-2 times per week.
____ 2. 3-4 times per week.
____ 3. 5-7 times per week.
- (53) C-4 The recommended duration of aerobic exercise for optimal cardiovascular benefit for the average healthy adult is:
____ 1. 10-19 minutes per session
____ 2. 20-40 minutes per session
____ 3. 41-50 minutes per session
____ 4. 51 minutes or more per session
- (54) C-5 If heart rate is used as a measure of work intensity, the goal for the optimum cardiovascular heart rate range for the average healthy adult is:
____ 1. 40-54 % of maximal heart rate.
____ 2. 55-69% of maximal heart rate.
____ 3. 70-84% of maximal heart rate.
____ 4. 85-100% of maximal heart rate.
- (55) C-6 The type(s) of exercise most beneficial to cardiovascular health is(are):
____ 1. Aerobic activity.
____ 2. Muscular strengthening exercises.
____ 3. Flexibility exercises.
____ 4. All of the above.

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- (56) C-7 The primary advantage(s) of regular exercise for the average healthy adult is(are):
- ☐ 1. Improved fitness (flexibility, muscle strength, endurance, cardio-respiratory endurance).
 - ☐ 2. Psychological benefits.
 - ☐ 3. Weight control and decrease in body fat.
 - ☐ 4. All of the above.
- (57-64) C-8 What are the additional advantages regular exercise may provide for Type II diabetic clients? Check all that could apply.
- ☐ 1. Decreased blood glucose level
 - ☐ 2. Decreased ability of the body (i.e. working muscle) to use glucose
 - ☐ 3. Decreased sensitivity to insulin
 - ☐ 4. Decreased triglycerides and increased high density lipoprotein cholesterol
 - ☐ 5. Decreased blood pressure
 - ☐ 6. Controlled blood glucose level with diet alone
 - ☐ 7. Elimination of periods of hypoglycemia
 - ☐ 8. Reduced amount of insulin or oral hypoglycemic agent required
- (65) C-9 A general recommendation is to advise Type II diabetic clients against exercise if the blood glucose level is equal to or greater than:
- ☐ 1. 100 mg/dl.
 - ☐ 2. 150 mg/dl.
 - ☐ 3. 200 mg/dl.
 - ☐ 4. 250 mg/dl.
 - ☐ 5. 300 mg/dl.
- (66) C-10 It is not advisable for a Type II diabetic individual to exercise when the blood glucose level is above the limit identified in question C-9 because:
- ☐ 1. The blood glucose may rise even higher.
 - ☐ 2. The blood glucose may drop to a dangerous level.
 - ☐ 3. The blood glucose level will not change.
 - ☐ 4. The blood glucose may rise or drop to dangerous level.
- (67) C-11 Generally the most appropriate times for a person with Type II diabetes (who receives insulin or an oral hypoglycemic agent) to check blood glucose levels after exercise are:
- ☐ 1. Probably not necessary to check blood glucose levels after exercise.
 - ☐ 2. Within an hour after exercise, and 4-6 hours later or before bed (more frequently if there are signs of an insulin reaction.)
 - ☐ 3. At one, two, and three hours after exercise (more frequently if there are signs of an insulin reaction.)
 - ☐ 4. Two hours after exercise and before bed.
- (68) C-12 A risk which may occur when exercising at the time of peak insulin action is that:
- ☐ 1. Enhanced insulin action may precipitously reduce blood glucose.
 - ☐ 2. Reduced insulin action may dramatically increase blood glucose.
 - ☐ 3. Muscles near the insulin injection site may cramp.
 - ☐ 4. The period of "peak" insulin action will be shortened.

Three examples are given below of situations where diabetic individuals are involved in exercise. Do you think additional snacks/feedings are needed? Please check the recommendation you think most appropriate in the blanks to the left of each case description. Use only the four choices listed below.

1. Add 0 grams of carbohydrate (CHO) per hour of exercise.
2. Add 10-15 grams of carbohydrate (CHO) per hour of exercise.
3. Add 16-30 grams of carbohydrate (CHO) per hour of exercise.
4. Add 31-45 grams of carbohydrate (CHO) per hour of exercise.

Case A:

- | | | | |
|------|-------------------|--------------------------------------|--------------------------------|
| (69) | <u>Added CHO</u> | <u>Diabetes Mellitus:</u> | Type II, no medication. |
| | 0 g CHO _____ | <u>Client Description:</u> | Male, 225 lbs., 5 ft. 10 in. |
| | 10-15 g CHO _____ | <u>Pre-exercise blood glucose:</u> | 210 mg/dl |
| | 16-30 g CHO _____ | <u>Length/intensity of activity:</u> | one hour, moderate intensity |
| | 31-45 g CHO _____ | <u>Examples of activity:</u> | walking 2 1/2 miles, gardening |

Case B:

- | | | | |
|------|-------------------|--------------------------------------|-------------------------------|
| (70) | <u>Added CHO</u> | <u>Diabetes Mellitus:</u> | Type II, insulin requiring |
| | 0 g CHO _____ | <u>Client Description:</u> | Female, 125 lbs., 5 ft. 5 in. |
| | 10-15 g CHO _____ | <u>Pre-exercise blood glucose:</u> | 140 mg/dl |
| | 16-30 g CHO _____ | <u>Length/intensity of activity:</u> | one hour, moderate intensity |
| | 31-45 g CHO _____ | <u>Examples of activity:</u> | leisurely bicycling, tennis |

Case C

- | | | | |
|------|-------------------|--------------------------------------|----------------------------------|
| (71) | <u>Added CHO</u> | <u>Diabetes Mellitus:</u> | Type II, oral hypoglycemic agent |
| | 0 g CHO _____ | <u>Client Description:</u> | Female, 175 lbs., 5 ft. 5 in. |
| | 10-15 g CHO _____ | <u>Pre-exercise blood glucose:</u> | 200 mg/dl |
| | 16-30 g CHO _____ | <u>Length/intensity of activity:</u> | one hour, moderate intensity |
| | 31-45 g CHO _____ | <u>Examples of activity:</u> | walking 2 1/2 miles, gardening |

SECTION D: QUESTIONS regarding DEMOGRAPHIC INFORMATION

- (1-2) D-1 How many years have you practiced in the field of dietetics?
 _____ Years (Please round to the nearest whole year.)
- (3) D-2 Are you a registered dietitian?
 _____ 1. Yes
 _____ 2. No
- (4) D-3 Check the appropriate status of your formal education.
 _____ 1. Bachelor's Degree
 _____ 2. Master's degree in progress
 _____ 3. Master's Degree
 _____ 4. Doctorate in progress
 _____ 5. Doctorate

12

- (5-6) D-4 In what year was your highest degree obtained? _____ (Year)
- (7-12) D-5 It is important to know what type(s) of educational background you have in exercise (not necessarily exercise related to diabetes.). Please check all below that apply.
- _____ 1. College courses dealing with exercise physiology/physical education
 - _____ 2. Workshops/seminars dealing with exercise
 - _____ 3. Reading exercise-related articles in professional journals
 - _____ 4. Received C.E. credit from attending national/state meetings or by other means
 - _____ 5. Other (please specify) _____
 - _____ 6. None of the above
- (13-17) D-6 Please check each of the following that describe you.
- _____ 1. Member of ADA's Diabetes Care and Education Practice Group
 - _____ 2. Certified Diabetes Educator (C.D.E.)
 - _____ 3. Pursuing certification as a Diabetes Educator
 - _____ 4. Other formalized training in diabetes management, please specify: _____
 - _____ 5. None of the above
- (18) D-7 What is your age category?
- _____ 1. Less than 25 years
 - _____ 2. 25 to 29 years
 - _____ 3. 30 to 39 years
 - _____ 4. 40 to 49 years
 - _____ 5. 50 years or more
- (19-20) D-8 Do you have diabetes mellitus?
- _____ 1. Yes IF YES: Type I _____ Type II _____
Gestational _____ (past or present)
 - _____ 2. No
- (21-22) You are welcome to write your comments below. We especially want to know if you want continuing education on this topic, and if so, what form of C.E. would you prefer?

Thank you for your participation! A summary of the data from the survey will be published in 1989 in *THE VOLUNTEER*. Please return the completed survey by Friday, October 21, 1988 to: Janice L. Kidd, R.D., P. O. Box 11243, Knoxville, TN 37939.

Appendix 2

Survey Correspondence

- Letter of Endorsement from Tennessee Dietetic Association President
- Initial Cover Letter, 10-4-88
- Postcard Reminder/Thank you to All Respondents, 10-19-88
- Second Cover Letter, 11-2-88
- Third Cover Letter, 11-28-88



TENNESSEE DIETETIC ASSOCIATION

875 Rodney Drive • Nashville, Tennessee 37205 • (615) 352-3474

Dear Member of the Tennessee Dietetic Association:

Would you please take a few moments of your time to cooperate with one of your colleagues?

Janice L. Kidd, M.B.A., R.D., a member of our Tennessee Dietetic Association and a past T.D.A. Board member, is currently working on her dissertation for the completion of her doctoral degree at the University of Tennessee at Knoxville. Janice's research project, "Dietitians' Knowledge, Attitudes, and Counseling Practices Regarding the Role of Exercise in the Management of Diabetes Mellitus", includes a survey of dietitians in the state of Tennessee. This survey is included in this mailing to you.

As a Certified Diabetes Educator (C.D.E.), I am always looking for ways to expand my knowledge and expertise in the area of diabetes management, and I am looking forward to participating in this survey. As you are no doubt aware, the accuracy of any survey is dependent on the number of surveys that are completed and returned to the researcher. I urge you to complete the survey as soon as possible and return it so that the results can be compiled.

Janice plans to share the results with T.D.A. members in the future. I know you will be looking forward to learning more about the final conclusions. Thank you for supporting her efforts.

Sincerely,

Linda V. Callahan, L.D., C.D.E.

(Mrs.) Linda V. Callahan, L.D., C.D.E.
President

THE UNIVERSITY OF TENNESSEE
KNOXVILLE

October 4, 1988



College of
Human Ecology

Nutrition and
Food Science

Dear Fellow Tennessee Dietetic Association Member:

Diet, exercise, and insulin have been the cornerstones of diabetes management for well over 50 years. The professional and lay literature abound with information about the benefits of exercise. Dietitians frequently counsel individuals with diabetes, focusing primarily on the dietary aspect of diabetes management. However, diet and exercise go "hand in hand" in many cases. Documentation is almost nonexistent about whether dietitians are also counseling Type II diabetic clients about exercise. As part of a research project, we are surveying Tennessee dietitians to establish information on this topic.

We are conducting a survey of a random sample of T.D.A. members to determine their exercise counseling practices in the management of Type II diabetes. To determine the reasons for differences in counseling practices, the survey also requests information on personal health practices and knowledge about the role of exercise in diabetes management.

You are part of our random sample, which means that your name was one of 286 selected at random from the 1,000 names on the T.D.A. mailing list. It is extremely important that you complete the survey and return it as soon as possible whether or not you counsel individuals with diabetes. Although you are in no way obligated or required to participate, please read the enclosed letter from Linda Callahan, R.D., C.D.E., current T.D.A. president, requesting your cooperation in this study.

For purposes of follow-up it was necessary to code the survey instruments with a number in the upper right hand corner of the cover page. Your name will be held in strict confidence and will never be associated individually with the results of the survey in any way.

Please read the instructions carefully, complete the questionnaire, and return it in the enclosed self-addressed, stamped envelope as soon as possible or before October 21, 1988. If you have any questions, please call Janice Kidd at 615-584-3438. The survey will take approximately 30 minutes to complete. As a token of appreciation for your time, we will be glad to send you a current reference list of articles about exercise and diabetes as well as a copy of "Tips for the Diabetic Athlete" by Nancy Clark, R.D. If you want copies of these materials, please enclose a separate request when you return the questionnaire. A summary of the results of the research project will be published in the *VOLUNTEER* in 1989. We sincerely appreciate your interest and support of this project.

Sincerely yours,

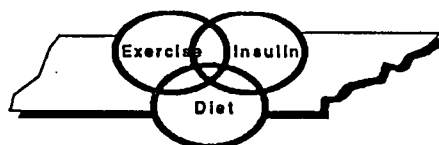
Janice Kidd, R.D.
Doctoral Candidate

Jane R. Savage

Jane R. Savage, Ph.D.
Professor Emeritus

October 19, 1988

Dear Fellow T. D. A. Member,



Two weeks ago a questionnaire about **Diabetes Management in Tennessee** was mailed to you. Your name was 1 of 286 drawn in a random sample of Tennessee Dietetic Association members.

If you have already completed the survey and returned it to me please accept my sincere thanks. **If not, please take time to complete it today!** If the results of this study are to accurately represent T.D.A., your participation is essential.

If by some chance you did not receive the questionnaire or it was misplaced, please call me right now, collect at 615-584-3438. I will get another one in the mail to you today.

Sincerely,

Janice Kidd, R.D.

THE UNIVERSITY OF TENNESSEE
KNOXVILLE



College of
Human Ecology

Nutrition and
Food Science

November 2, 1988

Dear Fellow Tennessee Dietetic Association Member:

One month ago, I wrote to you seeking your assistance in a University of Tennessee research project consisting of a survey on *Diabetes Management in Tennessee*. As of today, I have not yet received your completed questionnaire. If you have already completed the survey and returned it, please accept my sincere thanks. If not, please take a few minutes to complete it today! In the event that your questionnaire has been misplaced, a replacement is enclosed.

Dr. Jane Savage and I are conducting a survey of a random sample of T.D.A. members to determine their exercise counseling practices in clients with Type II diabetes. To determine the reasons for differences in counseling practices and to provide general information about T.D.A. members as a whole, the survey also requests information on personal health practices and knowledge about the role of exercise in diabetes management.

I am writing to you again because of the significance each questionnaire has to the usefulness of this study. Your name was drawn at random through a scientific sampling process in which every Tennessee Dietetic Association member had an equal chance of being selected. This means that only 286 T.D.A. members are being asked to complete the questionnaire. Although you are not obligated to participate, if the results of this study are to be truly representative of Tennessee dietetic practice, it is essential that every person in the sample return the survey whether or not they are involved in clinical practice or in counseling individuals with diabetes.

For purposes of follow-up it was necessary to code the survey instruments with a number in the upper right hand corner of the cover page. Your name will be held in strict confidence and will never be associated individually with the results of the survey in any way.

If you have any questions, please call me at 615-584-3438. The survey will take approximately 30 minutes to complete if you counsel clients with diabetes, and only about 15 minutes if you do not provide direct patient care. As a token of appreciation for your time, I will be glad to send you a current reference list of articles about exercise and diabetes as well as a copy of "Tips for the Diabetic Athlete" by Nancy Clark, R.D. If you want copies of these materials, please enclose a separate request when you return the questionnaire. A summary of the results of the research project will be published in the *VOLUNTEER* in 1989.

Your cooperation is greatly appreciated.

Sincerely yours,

Janice Kidd, R.D.

THE UNIVERSITY OF TENNESSEE
KNOXVILLE

November 28, 1988

Dear Fellow Tennessee Dietetic Association Member:



College of
Human Ecology

Nutrition and
Food Science

I am writing to you about a University of Tennessee research project consisting of a survey on *Diabetes Management in Tennessee*. As of today, I have not yet received your completed questionnaire. If you have already completed the survey and returned it, please accept my sincere thanks.

Each completed questionnaire is important to the validity of this study. Only 286 T.D.A. members are being asked to complete the survey. Although you are not obligated to participate, if the results of this study are to be truly representative of Tennessee dietetic practice, it is essential that every person in the sample return the survey whether or not they are involved in clinical practice or in counseling individuals with diabetes. This is because past experience suggests that those of you who have not yet sent in your questionnaire may have quite different practices and opinions than those who have. For this reason, I will attempt to phone those dietitians who do not respond to this request for participation.

I want to accurately describe T.D.A. members' exercise counseling practices in clients with Type II diabetes. In order to also determine the reasons for differences in counseling practices and to provide general information about T.D.A. members as a whole, I have also requested information on personal health practices and knowledge about the role of exercise in diabetes management.

This is the first statewide study of this type that has been done. Therefore, the results are of particular importance to the many dietitians in our state and nation who are planning programs for diabetes education as well as continuing education programs for registered dietitians. The usefulness of the results depends on how accurately I am able to describe what Tennessee dietitians are doing.

It is for these reasons that I am sending this by certified mail to insure delivery. In case my other correspondence did not reach you, a replacement questionnaire is enclosed. Please complete and return it as quickly as possible to the address on the back of the questionnaire. For purposes of follow-up it was necessary to code the survey instruments with a number in the upper right hand corner of the cover page. Your name will be held in strict confidence and will never be associated individually with the results of the survey in any way. If you have any questions, please call me at 615-584-3438.

As a token of appreciation for your time, I will be glad to send you a current reference list of articles about exercise and diabetes as well as a copy of "Tips for the Diabetic Athlete" by Nancy Clark, R.D. If you want copies of these materials, please enclose a separate request when you return the questionnaire. A summary of the results of the research project will be published in the *VOLUNTEER* in 1989.

Your contribution to the success of this study is greatly appreciated.

Sincerely yours,

Janice Kidd, R.D.
Doctoral Candidate

1215 West Cumberland Avenue, Room 229/Knoxville, Tennessee, 37996-1900/(615) 974-5445, 974-3491

Appendix 3
Phone Follow-up Script

(1-3) I.D. NUMBER _____

Phone: (H) _____

(W) _____

Date of the call: _____

•Hello, this is Janice Kidd from the University of Tennessee. I would like to speak with _____.

•Hello, this is Janice Kidd from the University of Tennessee.

Earlier this fall, I sent you a copy of a survey entitled Diabetes Management in Tennessee. I didn't get your completed survey and I have a few questions that I need to ask you to validate my study. Would you mind spending about 5 minutes on the phone with me right now?

{Thank you very much.}

IF NO: Could you suggest a time that would be more convenient?

(4) A-1 Are you currently employed in the field of dietetics?

- ____ 1. Yes
____ 2. No IF NO: Go to Ques.-B-8.

(5-6) A-2 How many hours per week are you employed?
____ Hours

(7-8) A-3 How many years have you been in this position?
____ Years

(9) A-4 I have a list of 6 work settings. As I read the list, please tell me the setting in which you work most frequently.

- ____ 1. Medical school or other medical-related professional school
____ 2. University, college or other academic institution
____ 3. Hospital or clinic
____ 4. Food service management (schools, industrial setting, etc.)
____ 5. Community setting or public health
____ 6. Private Practice
____ 7. Other _____ please describe.

(10-11) A-5 Are you involved in direct patient /client care for 10 % or more of your work time?

- ____ 1. Yes
____ 2. No

IF NO: please tell me your principal activity-
for example, administration, research, education

NOW GO TO Ques. B-8.

(12) A-6 Do you counsel/educate Type II diabetic clients either individually or in a group?

- ____ 1. Yes
____ 2. No IF NO: go to Ques. B-8.

(13-19) A-7

Of the following choices I will read to you, which is the primary setting in which you counsel or educate Type II diabetic clients?

(Please check one choice in the primary setting column below.
Check as many "other" settings as are appropriate.)

Primary Setting	Other Settings	
_____	_____	1. Individually as an in-patient in a hospital or clinic
_____	_____	2. In a group of in-patients in hospital or clinic
_____	_____	3. Individually as an out-patient, include home visits
_____	_____	4. In a group in an out-patient setting
_____	_____	5. In a group in a community setting
_____	_____	6. Other (please specify) _____

Do you counsel clients in any other settings? What type of settings?

I have a few personal questions that ask about your height, weight, and participation in exercise. Would you mind answering them or would you prefer not to?

O.K. Thanks!

(O.K. That's fine. We'll skip on over to the last section.)

- (26-32) B-8
1. How tall you are in shoes with one inch heels?
_____ft. _____in.
 2. What is your weight when fully dressed?
_____lbs
 3. Would you say that you have a small, medium, or large frame?
_____small
_____medium
_____large
 4. MALE _____
FEMALE _____
- (33) B-9 Do you usually engage in vigorous exercise one or more times per week when vigorous exercise is defined as aerobic activity, for example, aerobic exercise class, running, walking briskly, etc.?
- _____ 1. Yes
_____ 2. No IF NO, go to ques. D-1.
- (34) B-10 How many times per week do you usually participate in some form of vigorous exercise?
- _____ 1. 1-2 times
_____ 2. 3-4 times
_____ 3. 5-6 times
_____ 4. 7 times
- (35) B-11 On the average, how long is each session of vigorous exercise?
- _____ 1. 10 Minutes or less
_____ 2. 11-20 minutes
_____ 3. 21-40 minutes
_____ 4. 41-60 minutes
_____ 5. over 1 hour

- (1-2) D-1 How many years have you practiced in the field of dietetics?

_____ Years (Please round to the nearest year.)

- (3) D-2 Are you a registered dietitian?

_____ 1. YES
_____ 2. NO

- (4) D-3 Please tell me the degrees that you have been granted.

Are you currently working on an advanced degree?

_____ 1. Bachelor's Degree
_____ 2. Master's degree in progress
_____ 3. Master's degree
_____ 4. Doctorate in progress
_____ 5. Doctorate

- (5-6) D-4 In what year was your (highest) degree obtained?

- (7-12) D-5 As I read the following list, please tell me which of the types of educational background you have had in exercise, NOT necessarily exercise related to diabetes. Please answer Yes or No to each type of activity.

_____ 1. College courses dealing with exercise physiology/physical education
_____ 2. Workshops/seminars dealing with exercise
_____ 3. Reading exercise-related articles in professional journals
_____ 4. Received C.E. credit from attending national/state meetings or by other means
_____ 5. Other (please specify) _____
_____ 6. None of the above

- (13-17) D-6 I would like to know if you have any particular training in diabetes. Please answer Yes or No to the following questions.

_____ 1. Are you a member of ADA's Diabetes Care & Education Practice Group?
_____ 2. Are you a Certified Diabetes Educator?
_____ 3. Are you pursuing certification as a Diabetes Educator
_____ 4. Do you have other formalized training in diabetes management?
_____ 5. _____
None of the above.

- (18) D-7 What is your age category?

_____ 1. Less than 25 years
_____ 2. 25-29 years
_____ 3. 30-39 years
_____ 4. 40-49 years
_____ 5. 50 years or more

(19-20) D-8 Do you have or have you ever had Type I, Type II, or gestational diabetes ?

☐ 1. Yes ☐ Type I
 ☐ Type II
 ☐ Gestational

☐ 2. No

(21-22) •Do you have any comments?

☐ Yes
☐ No Comments

•Would you like continuing education on this topic?

☐ Yes
☐ No

•If so, what form of C.E. would you prefer?

1. National meeting or workshop
2. State meeting
3. District meeting
4. Videotape
5. Audiocassette
6. Other_____

(23) Did you attend the T.D.A. meeting last month?

☐ 1. Yes
☐ 2. No

THATS ALL!
 THANK YOU SO MUCH FOR TAKING TIME TO TALK WITH ME.
 I REALLY DO APPRECIATE YOUR HELP!
 MERRY CHRISTMAS!

GOOD-BYE.

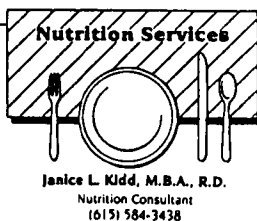
(24) Phone Call

☐ 1. Yes
☐ 2. No

Appendix 4

Educational Materials

- Cover letter, December, 1988
- Tips for the Diabetic Athlete
- References for Exercise and Diabetes Management



December, 1988

Thank you for taking time this fall to complete the survey *Diabetes Management in Tennessee*. You have contributed in a very significant way to a University of Tennessee study which I hope will have implications for diabetes educators and continuing education programs across the country.

As you requested, I have enclosed a list of current references on the "Role of Exercise in Diabetes Management" and a copy of "Tips for the Diabetic Athlete" by Nancy Clark, M.S., R.D. Hope you find them useful. If you have questions or need a resource person in this area, please feel free to call me.

Again, thanks for your interest in and support of my doctoral research project. Best wishes for a joyous holiday season and a healthy and prosperous new year!

Very sincerely,

Janice Kidd

1603 Deventer Ridge Drive, Knoxville, TN 37919-8907

SportsNutrition

SportsMedicine Systems, Inc.
Nancy Clark, MSRD

TIPS FOR THE DIABETIC ATHLETE

1. Exercise regularly, preferably at the same time each day to help you determine and stabilize your insulin and food requirements. *Consistency* is very important for optimal blood sugar control.
2. Exercise with someone else. This person should know that you are diabetic, be aware of the signs of hypoglycemia (confusion, weakness, unconsciousness, convulsions) and also know what to do in an emergency. Some diabetics are mis-diagnosed as drunks because their speech is incoherent and they stagger and fall.
3. Do not inject insulin into the muscles you will be exercising. Otherwise, the exercise causes the insulin to be mobilized faster and you may become hypoglycemic. You will also have less insulin available to you later in the day or evening.
4. For the average diabetic in training, you should keep the insulin dosage the same and eat more food. If you repeatedly become hypoglycemic during or after exercise (despite more food) you should talk to your doctor about reducing your insulin.
5. If you're going to be participating in a one-time bout of high activity (such as an unexpected basketball game), you should eat food beforehand and may want to reduce your insulin. Through experience, you'll learn about your body and what food / insulin strategy works best for you.
6. To best determine your energy / insulin needs, you'll want to monitor your blood glucose during training (i.e. between quarters of a football game; between laps of swimming). You may also have to re-establish these needs when the weather changes from hot to cold.
7. Always exercise *after* eating, when your blood sugar is on the rise. Do not start to exercise with low blood sugar. Eat a snack first.
8. Always carry sugar in some form with you. (Hard candies are popular because they aren't messy.) Also carry coins with you for a phone call or a vending machine.
9. During long-term exercise, you should plan to constantly replace glucose supplies. When swimming, you may want to pop out of the pool after 50 laps to drink a can of orange juice; during a marathon, you'll need to eat sugar or snacks along the route.
10. Since a diabetic's ability to store and mobilize carbohydrates in the right amounts at the right times is impaired, you should not try to "carbo-load". Rather, plan to eat extra calories during exercise. Experiment with different foods (apple juice, raisins, hard candy, bread, etc.) to determine the type and amount of food that settles well and enhances your performance.
11. On a long day trip, such as hiking or cycling, eat six small meals containing both carbohydrate and protein. Be over-prepared with extra "emergency food", in case you get unexpectedly delayed. Explain to your friends beforehand why you are unwilling to share the food with them.
12. Drink plenty of fluids before and during exercise, to prevent yourself from becoming dehydrated. You need more fluid if your urine is a dark color and in small amounts.
13. Since exercise has a lingering effect, you should eat more than usual after you stop exercising. Otherwise, you may become hypoglycemic that night or even the next day.

Copyright: Nancy Clark, MS, RD, SportsMedicine Systems, Boston 02167. Reprint permission granted with proper credit.

REFERENCES for EXERCISE and DIABETES MANAGEMENT

Compiled by Janice L. Kidd, R.D.
Doctoral Candidate
University of Tennessee, Knoxville
November, 1988

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NOTE: An asterisk () indicates an excellent review article of this subject.

Appendix 5

Additional Data

- Figure A5-1: Characteristics of nonrespondents who answered selected questions by phone ($n = 16$ respondents)
- Figure A5-2: Characteristics of counselors of clients with NIDDM who did not provide information about exercise ($n = 6$ respondents)
- Table A5-1: Respondents' primary counseling setting by monthly caseload ($n = 96$ respondents)
- Table A5-2: Respondents' method of providing exercise information by monthly caseload ($n = 95$ respondents)
- Table A5-3: Knowledge classifications by monthly caseload

1. **Employment**
 - 6 Counsel clients with NIDDM
 - 2 Employed in other positions in the field of dietetics
 - 8 Not employed in the field
2. **Work setting**
 - 1 University/college
 - 3 Hospital/clinic
 - 1 Community/public health
 - 3 Other
3. **Primary counseling setting for clients with NIDDM**
 - 2 Individual as an in-patient
 - 4 Individual as an out-patient
4. **Exercise habits**
 - 7 No regular exercise
 - 4 Aerobic exercise
 - 5 Regular aerobic exercise
5. **Education**
 - 8 Bachelor's Degree
 - 6 Master's Degree
 - 1 Doctoral Degree
 - 1 Missing data
6. **Years in practice**
 - 6 ≤ 5 years
 - 3 6 - 10 years
 - 3 11 - 15 years
 - 1 16 - 20 years
 - 3 > 20 years
7. **Age categories**
 - 0 < 25 years
 - 3 25 - 29 years
 - 6 30 - 39 years
 - 1 40 - 49 years
 - 6 ≥ 50 years
8. **Diabetes**
 - 1 Gestational
9. **Source of educational information on exercise physiology/physical education**
 - 16 None of the above
10. **Desire continuing education on the subject of exercise and the management of diabetes**
 - 12 Yes
 - 4 No

FIGURE A5-1

Characteristics of nonrespondents who answered selected questions by phone ($n = 16$ respondents)

1. **Knowledgeable classifications**
 - 4 Knowledgeable
 - 2 Not knowledgeable
2. **Health promotion activities**
 - 6 ≥ 7 of 10 health promotion activities
3. **Exercise habits**
 - 2 Don't exercise regularly
 - 1 Aerobic exercise
 - 3 Regular aerobic exercise
4. **Monthly caseload of clients with NIDDM**
 - 2 1 - 4 per month
 - 1 5 - 9 per month
 - 2 10 - 14 per month
 - 1 unavailable
5. **Supervisor's influence on inclusion of exercise information in counseling sessions with NIDDM clients.**
 - 6 My supervisor neither encourages nor discourages me to give exercise information.
6. **Age categories**
 - 0 <25 years
 - 1 25 - 29 years
 - 3 30 - 39 years
 - 1 40 - 49 years
 - 1 50 - 59 years
7. **Years in practice**
 - 2 ≤ 5 year
 - 2 6 - 10 years
 - 1 11 - 15 years
 - 0 16 - 20 years
 - 1 > 20 years
8. **Primary counseling setting**
 - 5 Individual as an in-patient
 - 1 Individual as an out-patient
9. **Work Setting**
 - 4 Hospital/clinic
 - 1 Community setting/public health
 - 1 Other
10. **Education**
 - 4 Bachelor's Degree
 - 2 Master's Degree
11. **Sources of information about exercise physiology and physical education**
 - 1 Workshops/seminars dealing with exercise physiology/physical education
 - 2 Reading exercise-related articles in professional journals
 - 1 Received continuing education credit
 - 2 None of the above

FIGURE A5-2

Characteristics of counselors of clients with NIDDM who did not provide information about exercise ($n = 6$ respondents)

TABLE A5-1

Respondents' primary counseling setting by monthly caseload (*n* = 96 respondents)

Setting	Caseload			
	1 - 4 <i>n</i> = 30	5 - 9 <i>n</i> = 20	10 - 14 <i>n</i> = 21	15 - 19 <i>n</i> = 12
				≥20 <i>n</i> = 13
<i>Individually as an in-patient</i>	20	13	17	12
<i>In a group of in-patients</i>	0	0	0	0
<i>Individually as an out-patient</i>	9	5	3	0
<i>In a group in an out-patient setting</i>	0	0	0	0
<i>In a group in a community setting</i>	0	0	0	0
Other	1	2	1	0

TABLE A5-2

Respondents' method of providing exercise information by monthly caseload
(*n* = 95 respondents)

Method	Caseload			
	1 - 4 <i>n</i> = 29	5 - 9 <i>n</i> = 21	10 - 14 <i>n</i> = 21	15 - 19 <i>n</i> = 11
				≥20 <i>n</i> = 13
	<i>no.</i>	<i>no.</i>	<i>no.</i>	<i>no.</i>
<i>Oral</i> explanation only	16	10	11	7
<i>Written</i> information only	0	0	0	0
<i>Written</i> information plus <i>oral</i> explanation	8	9	5	2
<i>Written</i> information plus <i>oral</i> explanation plus <i>client participation</i>	2	1	2	1
Other	1	0	1	1
Do NOT include information on exercise	2	1	2	0

TABLE A5-3

Knowledge classifications by monthly caseload

Caseload, <i>n</i>	Mean knowledge score	Knowledgeable ¹		Not knowledgeable	
		<i>no.</i>	(%)	<i>no.</i>	(%)
1-4, <i>n</i> = 30	16	20	(67)	10	(33)
5-9, <i>n</i> = 21	16	12	(57)	9	(43)
10-14, <i>n</i> = 21	17	14	(67)	7	(33)
15-19, <i>n</i> = 12	17	7	(58)	5	(42)
≥20, <i>n</i> = 13	16	7	(54)	6	(46)

¹Knowledgeable respondents correctly answered 16 of the 22 questions in the survey instrument in the knowledge section about the role of exercise in the management of diabetes mellitus.

VITA

Janice Lee Kidd is a native Tennessean and attended elementary and high school in Knoxville, Tennessee. She entered the Coordinated Undergraduate Program in Dietetics at the University of Tennessee, Knoxville (UTK) and was awarded a Bachelor of Science Degree with High Honors in Home Economic in 1975. She continued her education at UTK and was graduated with a Master's Degree in Business Administration in 1980. She was awarded a Doctor of Philosophy Degree in Human Ecology from the University of Tennessee, Knoxville in May, 1991.

Ms. Kidd has held a variety of professional positions in East Tennessee in the course of her career, which have included posts as administrative dietitian for ARA Services at Ft. Sanders Regional Medical Center, employee of Union Carbide Corporation, Y-12 Plant (Employee Health Center), and consultant to a long-term care institution and six out-patient dialysis facilities. In 1981 she established her consulting company, Nutrition Services. Clients have included the University of Tennessee Athletic Department, Tennessee Department of Corrections, Phyton Technologies, Grady's Restaurant, and Bush Brothers and Company.

The author is an active member in the American Dietetic Association (ADA) and its affiliates, including the Diabetes Care and Education Dietetic Practice Group. She has served as an officer at the national, state, and district levels of ADA. Ms. Kidd is also a member of the Society of Nutrition Education, American Home Economics Association, Kappa Omicron Nu and Golden Key Honor Societies. In 1981 she was selected as Tennessee's Recognized Young Dietitian of the Year. She is a Registered Dietitian, a Certified Home Economist, and a Licensed Dietitian/Nutritionist in the state of Tennessee.

Ms. Kidd is married to Richard E. Woods, Jr. and they have two sons.

- (5-6)

D-4

In what year was your highest degree obtained? _____ (Year)
- (7-12)

D-5

It is important to know what type(s) of educational background you have in exercise (not necessarily exercise related to diabetes.). Please check **all** below that apply.

1. College courses dealing with exercise physiology/physical education

2. Workshops/seminars dealing with exercise

3. Reading exercise-related articles in professional journals

4. Received C.E. credit from attending national/state meetings or by other means

5. Other (please specify) _____

6. None of the above
- (13-17)

D-6

Please check each of the following that describe you.

1. Member of ADA's Diabetes Care and Education Practice Group

2. Certified Diabetes Educator (C.D.E.)

3. Pursuing certification as a Diabetes Educator

4. Other formalized training in diabetes management, please specify: _____

5. None of the above
- (18)

D-7

What is your age category?

1. Less than 25 years

2. 25 to 29 years

3. 30 to 39 years

4. 40 to 49 years

5. 50 years or more
- (19-20)

D-8

Do you have diabetes mellitus?

1. Yes

IF YES: Type I _____ Type II _____

2. No

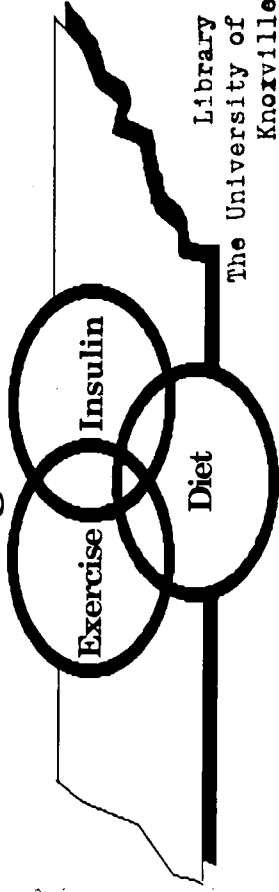
Gestational _____ (past or present)
- (21-22)

You are welcome to write your comments below. We especially want to know if you want continuing education on this topic, and if so, what form of C.E. would you prefer?

(1-3)

91b
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part 4 p. 1051

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SECTION A: QUESTIONS about COUNSELING PRACTICES

These questions are designed to determine how often you counsel Type II (non-insulin dependent or adult-onset) diabetic clients and the extent of information you provide about the role and importance of exercise. Please fill in the blank or check only one answer unless otherwise indicated. Ignore the numbers in parentheses in the left margin since they are for data coding purposes only.

- (4)

A-1

Are you currently employed in the field of dietetics?

1. Yes

2. No

IF NO: Your answers to the other questions are still important. Please skip to Section B: Health Promotion Activities on p. 6 and complete the rest of the questionnaire.
- (5-6)

A-2

How many hours per week are you employed?

_____ Hours
- (7-8)

A-3

How long have you been in this position?

_____ Years
- (9)

A-4

What is your primary work setting? (Check only one answer.)

1. Medical school or other medical-related professional school

2. University/college or other academic institution

3. Hospital/clinic

4. Food service management (schools, industrial setting, etc.)

5. Community setting or public health

6. Private practice

7. Other (please specify) _____
- (10-11)

A-5

Are you involved in direct patient/client care for 10% or more of your work time?

1. Yes

2. No

IF NO: Please note your principal activity (for example, administration, research, education, etc.) below:

Your answers to the other questions are still important. Please skip to Section B: Health Promotion Activities on p. 6 and complete the rest of the questionnaire.

Thank you for your participation! A summary of the data from the survey will be published in 1989 in *THE VOLUNTEER*. Please return the completed survey by Friday, October 21, 1988 to: Janice L. Kidd, R.D., P. O. Box 11243, Knoxville, TN 37939.

(12) A-6 Do you counsel/educate Type II diabetic clients either individually or in a group?

1. Yes

2. No

IF NO: Please skip to Section B: Health Promotion Activities on p. 6 and complete the rest of the questionnaire.

(13-19) A-7 Of the following choices, which is the primary setting in which you counsel or educate Type II diabetic clients? In what other settings do you counsel clients? (Please check one choice in the primary setting column below. Check as many "other" settings as are appropriate.)

Primary Setting	Other Settings
	1. Individually as an in-patient in a hospital or clinic
	2. In a group of in-patients in hospital or clinic
	3. Individually as an out-patient, include home visits
	4. In a group in an out-patient setting
	5. In a group in a community setting
	6. Other (please specify) _____

The next seven questions concern individual counseling of Type II diabetic clients. If you do NOT counsel Type II diabetic clients individually, please skip to the instructions preceding Question A-15 on p. 3.

(20-21) A-8 How many Type II diabetic clients do you counsel individually in a month's time? (Please put a specific number, not a range and include those Type II diabetic clients with other dietary modifications.)

_____ Type II diabetic clients per month

(22-23) A-9 How long is each initial individual counseling session with a newly diagnosed Type II diabetic client? Please put a specific number of minutes, not a range. (Note: Consider a "new" diagnosis as one made in the last 6 months.)

_____ Minutes per initial session

(24-25) A-10 How long is each follow-up individual counseling session for a previously diagnosed Type II diabetic client? (Please put a specific number of minutes, not a range.)

_____ Minutes per follow-up session

Three examples are given below of situations where diabetic individuals are involved in exercise. Do you think additional snacks/feedings are needed? Please check the recommendation you think most appropriate in the blanks to the left of each case description. Use only the four choices listed below.

1. Add 0 grams of carbohydrate (CHO) per hour of exercise.
2. Add 10-15 grams of carbohydrate (CHO) per hour of exercise.
3. Add 16-30 grams of carbohydrate (CHO) per hour of exercise.
4. Add 31-45 grams of carbohydrate (CHO) per hour of exercise.

Case A:

(69) Added CHO
0 g CHO _____
10-15 g CHO _____
16-30 g CHO _____
31-45 g CHO _____
Case A:
Diabetes Mellitus: Type II, no medication.
Client Description: Male, 225 lbs., 5 ft. 10 in.
Pre-exercise blood glucose: 210 mg/dl
Length/intensity of activity: one hour, moderate intensity
Examples of activity: walking 2 1/2 miles, gardening

Case B:

(70) Added CHO
0 g CHO _____
10-15 g CHO _____
16-30 g CHO _____
31-45 g CHO _____
Case B:
Diabetes Mellitus: Type II, insulin requiring
Client Description: Female, 125 lbs., 5 ft. 5 in..
Pre-exercise blood glucose: 140 mg/dl
Length/intensity of activity: one hour, moderate intensity
Examples of activity: leisurely bicycling, tennis

Case C

(71) Added CHO
0 g CHO _____
10-15 g CHO _____
16-30 g CHO _____
31-45 g CHO _____
Case C
Diabetes Mellitus: Type II, oral hypoglycemic agent
Client Description: Female, 175 lbs., 5 ft. 5 in.
Pre-exercise blood glucose: 200 mg/dl
Length/intensity of activity: one hour, moderate intensity
Examples of activity: walking 2 1/2 miles, gardening

SECTION D: QUESTIONS regarding DEMOGRAPHIC INFORMATION

(1-2) D-1 How many years have you practiced in the field of dietetics?
_____ Years (Please round to the nearest whole year.)

(3) D-2 Are you a registered dietitian?
_____ 1. Yes
_____ 2. No

(4) D-3 Check the appropriate status of your formal education.
_____ 1. Bachelor's Degree
_____ 2. Master's degree in progress
_____ 3. Master's Degree
_____ 4. Doctorate in progress
_____ 5. Doctorate

(56) C-7 The primary advantage(s) of regular exercise for the average healthy adult is(are):

1. Improved fitness (flexibility, muscle strength, endurance, cardio-respiratory endurance).

2. Psychological benefits.

3. Weight control and decrease in body fat.

4. All of the above.

(57-64) C-8 What are the additional advantages regular exercise may provide for Type II diabetic clients? Check all that could apply.

1. Decreased blood glucose level

2. Decreased ability of the body (i.e. working muscle) to use glucose

3. Decreased sensitivity to insulin

4. Decreased triglycerides and increased high density lipoprotein cholesterol

5. Decreased blood pressure

6. Controlled blood glucose level with diet alone

7. Elimination of periods of hypoglycemia

8. Reduced amount of insulin or oral hypoglycemic agent required

(65) C-9 A general recommendation is to advise Type II diabetic clients against exercise if the blood glucose level is equal to or greater than:

1. 100 mg/dl.

2. 150 mg/dl.

3. 200 mg/dl.

4. 250 mg/dl.

5. 300 mg/dl.

(66) C-10 It is not advisable for a Type II diabetic individual to exercise when the blood glucose level is above the limit identified in question C-9 because:

1. The blood glucose may rise even higher.

2. The blood glucose may drop to a dangerous level.

3. The blood glucose level will not change.

4. The blood glucose may rise or drop to dangerous level.

(67) C-11 Generally the most appropriate times for a person with Type II diabetes (who receives insulin or an oral hypoglycemic agent) to check blood glucose levels after exercise are:

1. Probably not necessary to check blood glucose levels after exercise.

2. Within an hour after exercise, and 4-6 hours later or before bed (more frequently if there are signs of an insulin reaction.)

3. At one, two, and three hours after exercise (more frequently if there are signs of an insulin reaction.)

4. Two hours after exercise and before bed.

(68) C-12 A risk which may occur when exercising at the time of peak insulin action is that:

1. Enhanced insulin action may precipitously reduce blood glucose.

2. Reduced insulin action may dramatically increase blood glucose.

3. Muscles near the insulin injection site may cramp.

4. The period of "peak" insulin action will be shortened.

(26-27) A-11 How many follow-up counseling sessions do you usually have with each client?

(average) follow-up sessions per client

(28-31) A-12 Estimate the average amount of time you spend discussing exercise in the initial and follow-up counseling sessions? (Please put a specific number of minutes, not a range.)

Minutes (average) discussing exercise during the initial counseling session

Minutes (average) discussing exercise during the follow-up session

(32) A-13 For how many of the last five ambulatory Type II diabetic clients you've counseled, did you incorporate information about the importance of exercise?

_____ of the last 5 Type II diabetic clients.

(33) A-14 Which one of the following methods do you most frequently use in giving exercise information to your Type II diabetic clients?

1. Oral explanation only

2. Written information only

3. Written information plus oral explanation

4. Written information plus oral explanation plus client participation (i.e. contract, goal setting, formal commitment to program, etc.)

5. Other (please specify) _____

6. Do not include information on exercise

If you do NOT teach/lead group classes for Type II diabetic clients, please skip to the instructions preceding Question A-19 on p. 4.

(34-35) A-15 Approximately how many times per year do you teach/lead group classes for Type II diabetic clients?

Times per year

(36) A-16 Do you usually include information about exercise in your presentation?

1. Yes

2. No

(37) A-17 If your class or presentation is part of a series, is information about exercise included in other classes?

1. Yes

2. No

3. The classes I teach are not in a series or a part of another program.

(38-41) A-18 What percentage of total class time is devoted to exercise discussion? Complete either or both the blanks below.

Percent of total class time about exercise **IF** a single class

Percent of total class time about exercise **IF** a series of classes

If you do NOT include information about exercise when counseling or educating Type II diabetic clients, please skip the next two questions and go to question A-21 on p. 5.

A-19

The phrases below are topics which may be covered by a dietitian **discussing** exercise with a Type II diabetic client. Please rate each of the topics on the frequency with which **you** discuss them in your counseling sessions. Circle 1 for a topic which is never discussed, 2 for one rarely discussed, 3 for sometimes discussed, 4 for usually discussed and 5 for always discussed.

Frequency of Discussion

	Never	Rarely	Sometimes	Usually	Always
(42) 1. Precautions for diabetic clients when exercising	1	2	3	4	5
(43) 2. Need for physician's recommendation/approval	1	2	3	4	5
(44) 3. Checking blood glucose before & after exercise	1	2	3	4	5
(45) 4. Gradual introduction of exercise	1	2	3	4	5
(46) 5. Appropriate snacking for increased activity/exercise	1	2	3	4	5
(47) 6. Exercise's effect on blood glucose level	1	2	3	4	5
(48) 7. Increased sensitivity to insulin	1	2	3	4	5
(49) 8. Decreased need for insulin or oral hypoglycemic agent	1	2	3	4	5
(50) 9. Decreased risk of heart disease	1	2	3	4	5
(51) 10. Weight management	1	2	3	4	5
(52) 11. Psychological benefits (improved sense of well-being, etc.)	1	2	3	4	5
(53) 12. Frequency of exercise	1	2	3	4	5
(54) 13. Intensity of exercise (target heart rate)	1	2	3	4	5
(55) 14. Duration of exercise	1	2	3	4	5
(56) 15. "Warm up" and "cool down" periods	1	2	3	4	5
(57) 16. Types of exercise (examples of aerobic activity, flexibility exercises, etc.)	1	2	3	4	5
(58) 17. Other, please specify _____	1	2	3	4	5

SECTION C: QUESTIONS about EXERCISE

Although many dietitians have received no formal training in exercise physiology, it is important to determine dietitians' background in the areas of exercise as well as exercise as it relates to diabetes. Probably only dietitians who have specifically studied exercise and diabetes will be familiar with all the information, but we need **everyone** to complete this section. Rely on your current knowledge and please don't use references. Check only one response for each question unless otherwise indicated.

(50) C-1	Components of a well-balanced program of exercise include: 1. Aerobic activity 2. Muscular strengthening exercises. 3. Flexibility exercises. 4. All of the above.
(51) C-2	For optimal cardiovascular benefit, the number of times per week exercise is recommended for the average healthy adult is: 1. 1-2 times per week. 2. 3-5 times per week. 3. 6-7 times per week.
(52) C-3	In a program of physical activity where weight loss is the primary goal, the number of times exercise is recommended for maximal benefit is: 1. 1-2 times per week. 2. 3-4 times per week. 3. 5-7 times per week.
(53) C-4	The recommended duration of aerobic exercise for optimal cardiovascular benefit for the average healthy adult is: 1. 10-19 minutes per session 2. 20-40 minutes per session 3. 41-50 minutes per session 4. 51 minutes or more per session
(54) C-5	If heart rate is used as a measure of work intensity, the goal for the optimum cardiovascular heart rate range for the average healthy adult is: 1. 40-54 % of maximal heart rate. 2. 55-69% of maximal heart rate. 3. 70-84% of maximal heart rate. 4. 85-100% of maximal heart rate.
(55) C-6	The type(s) of exercise most beneficial to cardiovascular health is(are): 1. Aerobic activity. 2. Muscular strengthening exercises. 3. Flexibility exercises. 4. All of the above.

(34) B-10

How many times per week do you usually participate in some form of vigorous exercise?

1. 1-2 times

2. 3-4 times

3. 5-6 times

4. 7 times

(35) B-11

On the average, how long is each session of vigorous exercise?

1. 10 minutes or less

2. 11-20 minutes

3. 21-40 minutes

4. 41-60 minutes

5. Over one hour

(36) B-12

Do you measure your heart rate during this period of exercise?

1. Yes

2. No

(37) B-13

How frequently do you exercise in your target heart rate range?

1. Every time or almost every period of exercise

2. Usually--about three fourths of the time

3. Sometimes--about half the time

4. Seldom--about one fourth of the time

5. Never or almost never

6. Don't know

7. Don't measure heart rate

(38-48) B-14

What primary form does your regular exercise usually take? Please check only one primary form. Check any other form(s) of exercise in which you participate frequently.

Primary Form

Other Forms

1. Running/jogging

2. Walking

3. Swimming

4. Cycling (stationary or moving)

5. Rowing

6. Aerobic exercise/dance class

7. Aerobic exercise to music/tape/video at home

8. "Working out" at a gym/fitness center with weight equipment

9. Racquet sports, (tennis, racquetball, etc.)

10. Other, please specify

(49) B-15

How frequently do you spend time at the beginning of your exercise period "warming up" and time at the end "cooling down?"

1. Every time or almost every time

2. Usually--about three fourths of the time

3. Sometimes--half the time

4. Seldom--about one fourth of the time

5. Never or almost never

A-20

We want to know why dietitians provide information about exercise when counseling Type II diabetic clients. The sentences below are possible reasons. Please rank each of the reasons on its usual importance in your decision to include information about exercise in counseling. Please add any other reasons in the spaces in #9 and #10. Circle 1 to indicate a reason which is not important, 2 for a reason which is somewhat important, and 3 for a very important reason.

(59)

1. Exercise is important in managing diabetes.

1

2

3

(60)

2. Exercise decreases risk factors for heart disease.

1

2

3

(61)

3. Exercise decreases risk factors for other complications of diabetes such as obesity, hypertension, etc.

1

2

3

(62)

4. Client requires weight loss.

1

2

3

(63)

5. Written educational materials about exercise are available.

1

2

3

(64)

6. Patient is interested in the subject of exercise.

1

2

3

(65)

7. I believe that many patients comply with recommendations for exercise.

1

2

3

(66)

8. Health promotion is an important part of my job.

1

2

3

(67)

9. Other, please specify

1

2

3

(68)

10. Other, please specify

1

2

3

A-21

Which one of the following phrases best describes your supervisor's (or administrator's) influence on whether or not you include information about exercise in your counseling of Type II diabetic individuals? Select only one.

1. Inclusion of information about exercise is part of protocol.

2. My supervisor strongly encourages inclusion of exercise information.

3. My supervisor slightly encourages inclusion of exercise information.

4. My supervisor neither encourages nor discourages me to give exercise information.

5. My supervisor slightly discourages inclusion of exercise information.

6. My supervisor strongly discourages inclusion of exercise information.

7. I have no supervisor or administrator.

A-22 We want to know why dietitians do not provide information about exercise when counseling some or **all** Type II diabetic clients. The phrases below are possible reasons. Please rank each of the reasons on its **usual importance** in your decision to **exclude information about exercise** in some or all counseling sessions. Circle 1 to indicate a reason which is **not** important, 2 for a reason which is **somewhat** important, and 3 for a very important reason.

**Importance of Reason for
Excluding Information on Exercise**

	Not Important	Somewhat Important	Very Important
--	------------------	-----------------------	-------------------

- | | | | | |
|------|--|---|---|---|
| (1) | 1. Lack of confidence in my knowledge about exercise | 1 | 2 | 3 |
| (2) | 2. Lack of time in counseling session to cover exercise | 1 | 2 | 3 |
| (3) | 3. Lack of written educational materials about exercise | 1 | 2 | 3 |
| (4) | 4. Belief that information about exercise is NOT important | 1 | 2 | 3 |
| (5) | 5. Belief that diet-related knowledge is more important than exercise | 1 | 2 | 3 |
| (6) | 6. Belief that it is NOT appropriate for a dietitian to discuss exercise | 1 | 2 | 3 |
| (7) | 7. Client's lack of interest in exercise | 1 | 2 | 3 |
| (8) | 8. Client's noncompliance with exercise recommendations | 1 | 2 | 3 |
| (9) | 9. Client's limited access to exercise space/location | 1 | 2 | 3 |
| (10) | 10. Client's medical problem which prohibits/restricts exercise | 1 | 2 | 3 |
| (11) | 11. Professional liability if client is harmed by exercise | 1 | 2 | 3 |
| (12) | 12. Lack of knowledge of M.D.'s recommendations regarding exercise | 1 | 2 | 3 |
| (13) | 13. Another health care professional available to discuss exercise | 1 | 2 | 3 |
| (14) | 14. Other (please specify) _____ | 1 | 2 | 3 |

SECTION B: QUESTIONS about HEALTH PROMOTION ACTIVITIES This section will enable us to compare Tennessee dietitians to other groups in terms of personal health promotion activities. Please fill in the blank or check **only one** answer for each question, unless otherwise indicated.

- (15) B-1 Do you smoke cigarettes?
- | |
|-------------------------|
| 1. Yes |
| 2. I have quit smoking. |
| 3. I have never smoked. |
- (16) B-2 How often do you wear seat belts when you drive or ride in a car?
- | |
|---|
| 1. Every time or almost every time |
| 2. Usually--about three fourths of the time |
| 3. Sometimes--about half the time |
| 4. Seldom--about one fourth of the time |
| 5. Never or almost never |

(17) B-3 How frequently have you checked your blood pressure or had it checked in the last two years?

1. Not at all
2. Once
3. Twice
4. Three times
5. Four or more times

(18-19) B-4 How many hours do you usually sleep in a 24 hour period? Please put a specific number, not a range.

_____ Hours

(20) B-5 How often do you eat a variety of foods from each of the four food groups?

1. Every day or almost every day
2. Usually--about three fourths of the time
3. Sometimes--about half the time
4. Seldom--about one fourth of the time
5. Never or almost never

(21) B-6 What is the average number of alcoholic drinks you consume on a single occasion?

1. I don't drink alcohol.
2. 1 drink
3. 2 drinks
4. 3 or more drinks

(22-25) B-7 Have you had your blood cholesterol checked in the last two years?

1. Yes	IF YES: What was your last total blood cholesterol level?
2. No	_____ mg/dl

(26-32) B-8 Please complete:

- | |
|--|
| 1. Height (with one inch heels): _____ ft. _____ in. |
| 2. Weight: (fully dressed) _____ lbs. |
| 3. Frame size: Small _____ Medium _____ Large _____ |
| 4. Gender: Male _____ Female _____ |

(33) B-9 Do you usually engage in vigorous exercise one or more times per week, when vigorous exercise is defined as aerobic activity, for example aerobic exercise class, running, walking briskly, etc.?

1. Yes	IF NO: Please skip to SECTION C: EXERCISE on p. 9 and complete the rest of the questionnaire.
2. No	