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Validation of the Diabetes Attitude Scale on a sample of Quebec health-care professionals

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LAKEHEAD UNIVERSITY

VALIDATION OF THE DIABETES ATTITUDE SCALE ON A SAMPLE OF QUEBEC HEALTH-CARE PROFESSIONALS

BY

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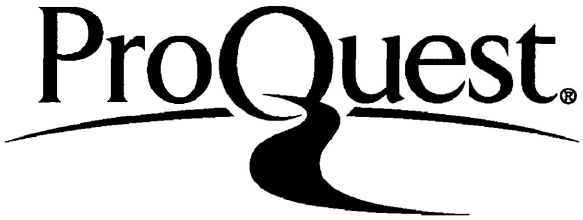

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Abstract

The following study aimed to: (1) compose a French version of Anderson et al.'s (1989) original Diabetes Attitude Scale (DAS) by sampling 5 groups of Quebec health care professionals; (2) increase the reliability and validity of the DAS (Anderson et al., 1989) through the creation of a revised version of this instrument.

This scale, entitled the revised Diabetes Attitude Scale (DAS-R), was developed through the efforts of a panel of 6 diabetes educators from Notre Dame Hospital, Montreal, Quebec. Thirty-eight items, thirty-one of these with Cronbach alphas greater than 0.37, were selected from the original DAS (1989) and combined with 27 items that had been created by members of the panel to form a 65-item scale. The items were revised by the panel and those deemed to be redundant or to increase scale variability were dropped. A total of fifteen items were dropped, and the final version of the scale contained 50 questions. The 50 -item scale was then mailed to 478 health care professionals, nurses, dietitians, physicians, pharmacists, and psychologists (specialists and nonspecialists in diabetes care) in all regions of Quebec. Four-hundred additional surveys were distributed to health care professionals through Quebec Diabetes Association conferences.

The surveys were returned by 62 nurses, 49 dietitians, 149 physicians, 55 pharmacists, and 5 psychologists, totaling 320 returns (a return rate of 36%). The returned surveys were analyzed, and a 37-item DAS-R composed of 8 subscales

resulted. Evidence for the reliability and validity of the 37-item DAS-R are included in this study.

The Diabetes Behaviour Scale (DBS) was created to provide evidence for the validity of the DAS-R. This 13-item scale was developed specifically to accompany the DAS-R and is a measure of diabetes management-related behaviours applicable to physicians. The development of the DBS was based on information obtained from specialized texts in diabetes care and opinions from a specialist in diabetes care and education (Notre Dame Hospital, Montreal). The scale is comprised of questions based on various behavioural issues appropriate to diabetes care (i.e. are patients referred to cardiologists, ophthalmologists when required? Does the physician attend diabetes workshops, seminars? Are patients referred to outpatient education clinics?). An item analysis of the scale revealed that 7 items had poor item-total correlations. These were dropped from further analyses. The resulting 6-item scale had a satisfactory Cronbach alpha value (alpha= .48).

Analyses of the results showed that there were significant correlations between two of the DAS-R subscales and the DBS. This is the first time in diabetes care research that an attempt at discovering a correlation between attitudes and behaviours has been accomplished using scales derived specifically for their measurement. The relationship between attitudes and behaviours found in this study supports Ajzen and Fishbein's theory of reasoned action.

Chapter 1

Introduction

Clinical, Empirical and Theoretical Context

Patient Compliance in Diabetes Mellitus.

Diabetes mellitus is a chronic failure of the normal processes of storage and utilization of insulin, with consequent inappropriate hyperglycemia (Watts, 1980). Diabetes is usually divided into two types: Type I (insulin dependent diabetes mellitus) resulting from insulin deficiency; and Type II (non insulin dependent diabetes mellitus) resulting from insulin resistance. Elevated glucose levels are of sufficient magnitude to produce such metabolic manifestations as glycosuria, excessive thirst and urination, loss of weight, weakness and fatigue, blurred vision, and in the extreme -- even coma (Genuth, 1982). The long-term complications of the disease may involve almost all organs with disabling consequences from benign dysesthesia of the legs to the total loss of pain sensation with the severe risk of foot lesions; from background diabetic retinopathy without any impairment of visual function to proliferative diabetic eye disease leading to blindness; from potentially reversible microproteinuria to end-stage kidney failure; and from minor arterial insufficiency of the lower limbs to major arterial obstruction leading to gangrene and amputations (Assal, Muhlhauser, Pernet, Gfeller, Jorgens & Berger, 1985).

Although incurable, the American Diabetes association issued a policy statement (Cahill et al., 1976) intended to emphasize the belief that the weight of evidence, particularly accumulated at that time, supported the concept that the microvascular complications of diabetes are probably decreased by a reduction of blood glucose concentrations. This 1976 policy statement declared: "In the past few years, numerous studies...have demonstrated that reduction of hyperglycemia...prevents or minimizes formation of diabetic-like lesions in eye, kidney and nerve...The contention that the microvascular complications occur independently of hyperglycemia and insulin deficiency and that control of metabolic events is not a factor in their progress does not appear tenable any longer...The goals of appropriate therapy should include a serious effort to achieve levels of blood glucose as close to those in the nondiabetic as feasible...In summary, current clinical and experimental data clearly demonstrate that optimal regulation of glucose levels should be achieved in the treatment of diabetes..." (Cahill et al., 1976 in Krall, 1984). Indeed, several researchers maintain that active participation by the patient in his diabetic regimen is essential in order that metabolic control be achieved (Hamburg et al., 1980; Sulway et al., 1980 in Gosselin, 1991).

Of all chronic diseases, diabetes seems foremost in putting the responsibility for ongoing good health squarely on the shoulders of the patient. Assuming responsibility for one's own health is not easy. Proper diabetes treatment requires not simply that patients take their medication and visit their doctor but that they ultimately make true lifestyle changes (Bush, 1987). Yet, "a major and substantial change in behaviour is easy to discuss but hard to achieve."

For one, the patient may view the treatment of diabetes as being worse than the disease itself (Bush, 1987). Once a patient becomes diabetic, he/she remains diabetic for life. He/she needs to follow a strict diet, both as far as what he/she eats and when he/she eats it are concerned. Unless a relatively mild diabetic, the patient will need to give himself/herself insulin injections anywhere from once to more than twice a day. He/she will need to use the correct insulin, measure the correct dosage, and administer it hygienically at the correct time. He/she will also be asked to test his blood glucose daily, interpret the tests correctly and take appropriate action if the results are not within the acceptable range (Watts, 1980).

Not surprisingly there have been repeated reports that diabetic patients' level of self-care leaves a great deal to be desired (Turbridge, 1953; Stone, 1961 in Watts, 1980). Indeed, rates of noncompliance have been estimated to range as high as 80% to 90% (Harris and Linn, 1985). Watkins et al. (1967) found that 80% of 60 diabetic patients administered their insulin in an unacceptable manner, 73% did not follow their diets, 50% exhibited poor foot care, and 45% did not test their urine correctly. In another study, it was found that approximately 75% of the patients with diabetes had significant deficits in their food intakes half of the time and 50% had deficiencies all of the time (Rosenstock, 1985). Mountier (1982) showed that 43% of the 111 diabetic patients in his sample did not test their blood glucose levels frequently enough to allow for modification in treatment (Gosselin, 1991). Recent studies have reported rates of regular urine testing as low as 30% and diet-regimen compliance in the 10-35% range. In a detailed examination of adherence to different aspects of the treatment plan, Cerkoney and Hart (1980) attained compliance levels of 81% for insulin

administration, 77% for foot care, 65% for diet, and 57% for urine testing. Only 7% of patients complied with all 45 steps considered necessary for good control (Rosenstock, 1985).

The Linear Model.

The potential of health care professionals to induce positive change in the diabetic patient is a much needed area for development. The traditional educational model of the past decade in diabetes care, the linear model, has emphasized that health care providers mould patients into knowledgeable, individuals concerning self-management skills. More specifically, through a one-way communication of information from provider to patient, the patient, theoretically , should be able to acquire the knowledge and skills that are needed to contribute to better self-care behaviour, resulting in improved glucose levels, decreased complications, reduced utilization of health care services, and ultimately improved quality of life.

In recent years, researchers have begun to understand that this linear model is both incomplete and too narrow. It is incomplete because, although improvements in diabetes knowledge and skills may be necessary to obtain enhanced metabolic status in diabetic patients, such improvements alone are probably insufficient to guarantee long-term enhanced physiological outcomes. Knowledge and skills are only two factors in determining self-care behaviour and subsequent metabolic status (Anderson et al., 1989). Indeed, Watkins et al. (1967) documented that patient knowledge did not ensure patient participation, and it has been demonstrated that increased knowledge makes no difference in glucose control over a 3-month period of assessment (Etzwiler, 1989). Graber et

al. (1977) have reviewed the effects of a number of diabetic education programs and reached the conclusion that they significantly improve knowledge about diabetes but fail to affect metabolic control (Watts, 1980). Many additional factors playimportant roles in regulating the level of glycemia in diabetic patients. These include family function, social and cultural environment, stress, socioeconomic status, health status, psychological and emotional well-being. Also important is the degree of patient participation in ongoing follow-up care, including medical treatment, continuing diabetes patient education, emotional support, and behavioural (i.e. coping) skills training (Anderson et al., 1989).

The linear model is too narrow because, based on the classical medical scheme, the model only allows for one-way transmission of information between the doctor/nurse/dietitian and the patient (Gfeller & Assal, 1982). The professional is viewed as the powerful expert provider and the patient as the passive recipient. Patients are expected to seek help for a problem, to describe their experience with the problem, and to comply with the recommendations of the health provider. Illness is viewed as a cluster of symptoms with a specific name and treatment program. Complaints for which there is no evidence of structural or functional deviation are irrelevant or outside the domain of medicine (Snyder, 1989). The linear model often fails to adequately account for the person, his or her social context, or the role of the health care provider. Patients often feel awed or resigned and helpless and tend to withdraw from involvement in their care (Funnell et al., 1991). Yet, nowhere is the issue of patient autonomy more central than in the treatment of diabetes where the major emphasis is on behaviour and lifestyle change (Donnelly & Anderson, 1990; Dunn, 1990). Each

person makes many diabetes-related choices each day. Successful diabetes self-care necessitates that patients be able to make informed choices and decisions that will help achieve their personal diabetes goals. There is an inherent tendency in all human beings towards health and growth. Thus, the fundamental right of an individual to be able to control his/her own health care behaviour must be recognized (Funnell et al., 1991).

Finally, the linear model fails to take into consideration health care professional attitudes and their importance in empowering patient self-management behaviours. A more appropriate educational approach to diabetes care is the empowerment model.

The New Trend in Patient Education: Empowerment

Rappaport defines empowerment as a process by which people gain mastery over their affairs. In health education, this increase in power is not a means to dominate or change others, but rather a means to effect change. Empowering patients to effect change can impact more than specific health behaviours. It has the potential to promote overall health and to expand resources in other personal and social arenas. The goal of empowering patients is to promote autonomous self-regulation so that the individual's potential for health and wellness is maximized. People are empowered when they have sufficient knowledge to make rational decisions, sufficient control and resources to implement their decisions, and sufficient experience to evaluate the effectiveness of their decision (Funnell et al., 1991).

Patient empowerment is attained through a collaborative patient-provider relationship. The ideal scenario involves a human relationship in which provider and patient are two experts, working together in the treatment of the latter. The two partners form a unity of cooperation towards a common goal and, in their communication, each fulfills his/her own role which complements the function of the other (Groen & Pelser, 1982). As the process of education and development proceeds, the educator helps patients acquire a combination of knowledge, skills, and heightened self-awareness regarding values, needs, and goals so that patients can use this power to act in their own self-interest (Funnell et al., 1991). The ultimate goal of educating the individual with diabetes is to provide the possibility for each person's development into an active (thinking) diabetic who is trying to understand his/her diabetes, rather than passively following the last orders of the doctor with little or no understanding of what is happening (Gay, 1983 in Drury, 1984). Together these ideas shape a philosophy described as empowerment.

An education program that has empowerment as its goal covers all aspects of diabetes as a biopsychosocial illness and knowledge of diabetes self-care recommendations and practices. In general, educators help to empower their patients at every encounter by enabling them to: (1) discover their capacity to take responsibility for their health, (2) develop solutions to their own problems, (3) express their feelings about having and treating diabetes.

Relevant diabetes information is presented in terms of the purposes, costs, and benefits of each self-care option. Aspects of the regimen, such as diet, monitoring and medications, are presented as tools that patients can use to care

for themselves, rather than as behaviours that must be complied with, that is, as goals in and of themselves. For example, home blood glucose monitoring and record keeping would be taught as a useful tool that patients use to adjust their diet and medications. The cost of monitoring includes both the monetary expense and the physical discomfort of testing, but the potential benefits include maintaining glycemic control with greater flexibility. This approach is in contrast to the more traditional approach to monitoring and record keeping as recommended behaviours that should be complied with so that the health professional can use the data to make changes in the treatment regimen and to praise or criticize the patient's self-care efforts (Funnell et al., 1991).

Once patients gain some understanding of diabetes self-care choices and consequences, they can identify their own goals based on their personal level of responsibility and diabetes-related values and philosophy. Specific diabetes content tailored to the patients' personal goals can be presented. For example, dietary recommendations can be presented as choices to achieve personal goals related to blood glucose goals, weight goals, cholesterol and lipid goals, complications status, nutrition, and general health. At any one time, patients may choose none, one, or all of these aspects as personal goals. Much of the education program is focused on assisting patients achieve their goals using a problem-solving model of goal identification. According to this framework, problems that are identified and solutions that are chosen by patients tend to be more relevant and meaningful because they are generated within the context of their lifestyles, values, beliefs, and support systems. The educator facilitates this process by helping patients to explore problems, express feelings, develop alternative

options, consider the consequences of various options, and come to appropriate decisions. The educator serves as a sounding board and a resource person. The educator does not try to solve patients' problems for them because this would create an unequal relationship in which the educator would be seen as more powerful and competent. Such a relationship would violate the basic tenets of the patient empowerment approach that views patients as inherently trustworthy and able, with a fundamental drive toward health and growth. Failure to reach goals is viewed as a problem to be solved and dealt with in that framework. Learning what does not work provides valuable information that can be incorporated into a new problem-solving strategy. Specific strategies may include assertiveness training, networking with other patients with diabetes, or holding a family meeting (Funnell et al., 1991).

The educator needs to create an environment in which patients are encouraged to open up and explore what diabetes means to them and how they feel about it. Through interpersonal exploration the educator can help patients examine their feelings and perceptions about having and treating diabetes. However, for individuals to explore and share their feelings and personal meaning, they must first feel accepted and valued as persons. Many of the emotions associated with diabetes can be uncomfortable for the patient and sometimes for the educator. For example, anger about the unfairness of having diabetes; fear about the difficulties of self-care and/or the consequences of the disease; feelings of isolation and loneliness; and mourning the loss of the healthy self--all may be difficult to talk about. Patients must trust the educator and, in a group situation, the other patients before they will risk sharing how they really

feel. The educator's own demeanour toward patients will be a very important factor in setting the psychological climate (Anderson et al., 1988). Thus patient education is apt to succeed in so far as the physician or other members of the medical team implementing the educational interventions are able to generate an alliance, the main ingredient of which is empathy (Bush, 1987). If there is empathy, there is real understanding of the other as another person (Stoeckle, 1987). There is a capacity to imagine what it is like to be in the other's shoes, a sense that the patient and health care professional are members of the same human family (Berg, 1987)). Empathic receptivity involves more than building rapport, it means the establishment of a healing climate in which the caregiver makes a genuine and continuous effort to view the situation through the patient's eyes and communicate that understanding to the patient (Berg, 1987). The treatment can only be successful if the physician/nurse/dietitian know and take into account the subjective experience of the patient. Neglecting the bearer of diabetes and his/her experience as a diabetic amounts to practicing all alone, without a patient (Gfeller and Assal, 1982). Attention to another's attitudes, convictions, feelings and choices, can lead to a deeper respect for autonomy and thereby to improved care for the patient as a person (Berg, 1987). When patients feel valued, respected and trusted, they will usually respond positively to the opportunity to share their feelings and meanings about diabetes (Anderson et al., 1988).

In summary, empowerment offers a practical, holistic framework for patient education. It is an idea whose time has come for diabetes education (Funnell et al., 1991). The importance of adopting a positive educational

philosophy is important, because the philosophy that influences the educator will also influence his/her professional behaviours and attitudes (Funnell et al., 1991). There is emerging evidence that health care professional attitudes are in need of amelioration

Health-Care Professional Attitudes Influence Patient Outcomes

The National Diabetes Commission's 1975 report to Congress suggested that the diabetes-related attitudes of health care professionals are often inappropriate and could lead to apathy, anxiety, depression, insecurity, confusion, and disorganization in the diabetic patient (Anderson et al., 1989). Specifically, such negative emotional states are likely to contribute to the deterioration of self-care practices, which consequently result in the dysregulation of glycemia (Rubin et al., 1989). Scientific evidence was not offered to support these assertions, which appeared to be based on firsthand observations and anecdotal evidence (Anderson et al., 1989). In one of the few studies that has examined health-care professional attitudes toward diabetes since the commission's report, investigators at the Indiana Diabetes Research and Training Center found that housestaff attitudes regarding the treatment of diabetes were effective predictors of the level of glycemic control in their patients. Physicians who achieved better patient outcomes believed that: (1) strict blood glucose control had the potential benefit of reducing the incidence of large vessel disease among diabetics; (2) their patients were less likely to achieve euglycaemia than the patient of their peers (Weinberger et al., 1984). Weinberger (1984) claimed that despite both these beliefs being questionable, they may have resulted in more aggressive

management strategies by successful physicians. One last finding was that relatively successful physicians were more likely to hospitalize all patients who presented with random blood sugar levels above 400 mg./dl.. They were willing to attempt to achieve euglycaemia without insulin, but were unwilling to let patients blood sugar levels get out of control (Weinberger et al., 1984). This study also revealed that, physicians' attitudes were related to patient outcomes, while physicians' knowledge of diabetes was not (Anderson et al., 1989).

Ajzen and Fishbein's Theory of Reasoned Action.

Professionals' attitudes may affect patient outcomes through their influence on health care professionals' behaviours. The relationship between attitudes and behaviour is complex and has been a major focus of social psychological theory. One of the major models, which has considerable empirical support, is Ajzen and Fishbein's (1973) theory of reasoned action (Anderson et al., 1991). A major feature of their theory is that most behaviour is under volitional control, and that in a given situation, a person holds or forms a specific behavioural intention that influences his subsequent overt behaviour (Ajzen & Fishbein, 1973). Behavioural intentions are influenced by attitudes and social norms. Social norms represent one's perceptions of how important others view the behaviour in question, while attitudes are said to represent an overall evaluative (negative/positive) feeling toward the behaviour. An attitude toward a particular behaviour represents a summation of beliefs about that behaviour. For example, according to Ajzen and Fishbein's model, the most effective predictor of a diabetes educator's decision to recommend self-blood glucose monitoring to

patients would be that educator's intention to make such recommendations (Anderson et al., 1991).

The intention to recommend self-blood glucose monitoring would be a function of the educator's attitude toward the efficacy of self-blood glucose monitoring and the educator's social norms, (i.e. his or her perceptions of how important others view self-blood glucose monitoring). The educator's attitude toward monitoring, whether positive or negative, would largely be a function of the educator's beliefs about monitoring. For example, does the educator believe that self-blood glucose monitoring is generally helpful in self-care, and that patients are usually willing to try it? Does the educator believe that blood glucose monitoring is likely to have a positive impact on glucose control and the subsequent development of diabetes complications? These and other relevant beliefs about glucose monitoring would be combined to form an overall positive or negative attitude about the efficacy of recommending self-blood glucose monitoring and would be a major factor in determining the educator's behavioural intention to recommend this technology to patients. This model of behaviour suggests that diabetes-related attitudes and the beliefs that underlie them will have a significant influence on the behaviour of diabetes educators in the education of their patients (Anderson et al., 1991).

However, viewing attitudes as either the cause or effect of behaviour would be overly simplistic (Anderson et al., 1989). Although attitudes tend to produce related behavioural intentions, the actual behaviour is moderated by such external variables as personality traits and demographic variables. These variables may influence the beliefs a person holds or the relative importance

he/she attaches to attitudinal and normative considerations (de Weerdt et al., 1989). Therefore, it is likely that variation in diabetes-related attitudes will explain some of the variation in the diabetes-care behaviour of health care professionals. How important a contribution diabetes attitudes will make to understanding the behaviour of health-care professionals needs to be determined by further research. Such research requires a valid and reliable measure of diabetes-related attitudes. The Diabetes Attitude Scale (DAS; Anderson, Donnelly & Gressard, 1987), a measure of the belief component of attitudes, has been developed specifically for this purpose (Anderson et al., 1989). The scale possesses several advantages: (1) it is the only instrument to date which has been developed for the measurement of diabetes-related attitudes of health care professionals; (2) it is applicable to various disciplines (i.e. medicine, nursing, nutrition); (3) it is relevant to diabetes care given in various settings (i.e. clinics and hospitals); (4) it is applicable to specialists as well as nonspecialists in diabetes care (Anderson et al., 1990)

The Diabetes Attitude Scale: Background.

The content of the Diabetes Attitude Scale was developed through efforts of a national panel of 17 diabetes experts. The panel included 3 physicians, 3 nurses, 4 nutritionists, 3 consumers of diabetes care and 4 behavioural scientists. The group interacted by mail through a modified Delphi process. Members were asked to write Likert type attitude items (Anderson et al., 1990). i.e. statements that are responded to on a five-point scale that indicates the respondents' degree of agreement or disagreement with the statements. To ensure the

comprehensiveness of the Diabetes Attitude Scale, the panel was asked to write items covering four global areas of diabetes: the disease itself, treating diabetes, diabetic patients and professional education in diabetes. The panel wrote a total of 347 attitude items: 62 items related to the disease itself, 135 items related to treating diabetes, 92 items focused on the individuals with diabetes and 58 items on diabetes professional education (Anderson et al., 1990).

The panel members reviewed all 347 items, suggested wording changes, indicated whether the correct responses to an item was to agree or disagree and selected 20 items from each of the 4 areas that they believed addressed important issues in diabetes and therefore should be included in the final scale. The group was asked to indicate the correct response for each item to provide a criterion for desirable or appropriate attitudes. This criterion was established because one of the intended uses of the scale was the evaluation of professional education programs. Items that had at least an 80% level of agreement in the direction of the appropriate response and more than five votes for inclusion were included in a preliminary version of the scale. This resulted in an instrument for which there was a high level of agreement among the panel of diabetes experts regarding both the significance of the items and their correct responses. The preliminary version of the scale which contained 60 items was pilot tested using a convenience sample of 60 health care professionals. An item analysis, examining item variability and inter-item correlations, was performed and a Cronbach's alpha (internal consistency reliability) of .82 was obtained for the total scale. Items that decreased the scale reliability were revised or eliminated. The revised scale contained 50 items (Anderson et al., 1989).

Psychometric Analyses of the Diabetes Attitude Scale.

Psychometric analyses of the 50 items using a sample of 633 nurses, 322 dietitians and 116 physicians identified eight factors. These factors represented health care professionals' attitudes toward: (1) the need for special training in the treatment of diabetes; (2) the importance of blood glucose control in minimizing the complications of diabetes; (3) the role of the patient in diabetes self-care and management; (4) patients' commitment to controlling their disease; (5) the importance of a team approach to diabetes care; (6) the seriousness of noninsulin-dependent diabetes (NIDDM); (7) the difficulties in treating diabetes; (8) the efficacy of outpatient education (Anderson et al., 1990).

Although the internal consistency of the total scale was satisfactory it varied considerably for the subscales with 4 out of 8 of these having reliabilities near or below 0.5. The low reliabilities of the compliance, NIDDM, difficult-to-treat, and outpatient education subscales were most likely a function of the small number of items that define these subscales and the homogeneous nature of the population that was sampled (Anderson et al., 1989). To raise these reliabilities to a .70 level (estimated by the Spearman-Brown formula), compliance would have to be increased to 7 items, NIDDM to 6 items, difficult to treat to 10 items, and outpatient education to 4 items.

The amount of evidence for the validity of the Diabetes Attitude Scale is limited at this stage of its development for a number of reasons (Anderson et al., 1989). First, although the total scale and most of the subscales were supported by statistically significant differences among health care professional group means,

the actual differences were small in magnitude. This is probably due to the homogeneity of the health care professionals in the sample virtually all of whom were members of diabetes organizations. This means that, although some health-care professionals were categorized as nonspecialists according to the study criteria, their membership in diabetes organizations suggests that they had a special interest in diabetes. The differences in the attitudes of health-care professionals should be greater when the Diabetes Attitude Scale is administered in a more heterogeneous population (Anderson et al., 1989). Second, testing for validity was made difficult by the lack of diabetes-related measurement instruments that could have been completed at the same time the Diabetes Attitude Scale was filled out. Such measures could have provided evidence regarding the convergent and/or divergent validity of the scale (Anderson et al., 1989).

The present study was carried out in order to improve the reliability and validity of the Diabetes Attitude Scale. Several hypotheses related to the revised Diabetes Attitude Scale's (DAS-R) validity are examined: (1) The validity for the total scale and the individual subscales was examined by testing the hypothesis that diabetes-related attitudinal differences would occur between health care professional specialists (i.e. spend $\geq$ 30% of their time treating diabetic patients) and nonspecialists. Further, we hypothesized that the attitudes of specialists will be in closer agreement to the panel of diabetes experts than health care professionals who do not specialize in diabetes care; (2) The validity of each of the subscales was examined indirectly by testing if hypothesized mean differences exist between physicians and each of the other health care professional groups

(i.e. physicians versus nurses, dietitians, psychologists, and pharmacists). We hypothesized that since physicians are trained as more autonomous decision-makers and have the final responsibility for treatment decisions, their diabetes-related attitudes would be significantly different than other professional groups on certain scales; (3) Our third hypothesis concerning scale validity involved establishing a correlation between the DAS-R and a scale which we developed to measure the diabetes management behaviour of physicians, the Diabetes Behaviour Scale (DBS). It was anticipated that if physician attitudes, as measured by the scale (DAS-R), are important in relation to the habitual management of diabetic patients by physicians, then correlations between scale measures and behaviours would occur.

Chapter 2

Materials and Methods

Item Generation (DAS-R).

The content of the revised Diabetes Attitude Scale was developed through the efforts of 6 professionals knowledgeable in the field of diabetes. The panel included 1 physician, 1 nurse, 1 dietitian, 1 pharmacist, and 2 psychologists. All were diabetes educators at the Day Centre for Diabetics of Notre Dame Hospital, Montreal, Quebec. Members were asked to write Likert type attitude items related to the eight factors previously described based on definitions and sample items related to each of the scales (Anderson et al., 1990). A total of 65 items were reviewed by panel members. Thirty-four items were drawn directly from the original DAS, thirty-one of these for their high Cronbach alpha values (above 0.37). Based on Anderson's recommendations for improving subscale reliabilities, twenty-seven new items were written by panel members: 8 were added to the Compliance subscale (Factor 4), 5 were added to the Noninsulin-Dependent Diabetes subscale (Factor 6), 8 were added to the Difficult to Treat subscale (Factor 7), 4 were added to the Outpatient Education subscale (Factor 8), one was added to Patient Autonomy (Factor 3) and to Team Care (Factor 5) respectively. Together these 61 items formed the structure of eight predetermined factors obtained from the original version of the DAS. A ninth factor was added, which was composed of 4 questions and labeled Impact of Diabetes on Patients' Lives. The items composing this scale were obtained from Factor 5 of Anderson et al.'s (1990) DAS for patients. Together, these nine factors served as a

prototype from which we could begin building a revised DAS. The 65 items were translated into French by a panel member. Subsequently, the eight scales were back-translated by a professional to ensure a wording as close to the English version as possible. Then the group reviewed the items, suggested wording changes, and indicated whether the correct response to an item was to agree or disagree. The group was asked to indicate the correct response for each attitude item to provide a criterion for desirable or appropriate attitudes (Anderson et al., 1989). This criterion was established because one of the intended uses for the scale was the evaluation of professional education programs (Anderson et al., 1989). Items that had at least an 83% (5 out of 6 professionals) level of agreement on the direction of the appropriate response and ≥ 2 votes for inclusion (33% of the group) were included in the final version of the scale (Anderson et al., 1989). This resulted in an instrument for which there was a high level of agreement among the panel of diabetes experts regarding both the significance of the items and their correct responses (Anderson et al., 1989). The revised scale contained 50 items (31 of the items were selected from the DAS (1989), 4 of the items were from Factor 5 of Anderson's DAS (1990) for patients , and 15 of the items were created by the Notre dame diabetes educators).

Item Generation (Diabetes Behaviour Scale).

This 13 item scale was developed specifically to accompany the DAS and is a measure of diabetes management-related behaviours applicable to physicians. The development of the Diabetes Behaviour Scale (DBS) was based on information obtained from specialized texts in diabetes care, and opinions

provided by Dr. Gosselin, a clinical psychologist specializing in diabetes care and education, from Notre Dame Hospital, Montreal, Quebec.

The survey was formulated in such a way that respondents were asked to answer "yes " or "no" to 13 questions we felt were measures of diabetes-related management behaviours. "Yes" answers accorded respondents with one point, and "no" answers accorded respondents with two points for each question completed. Thus, participants could score anywhere on a continuum from 13 to 26 points. Low scores (below 20) were indicative of a conscientious and exemplary form of diabetes care, while high scores (above 20) were associated with poor diabetes management behaviours.

Some examples of items which may be found in this survey include: "Do you recommend glucose self-monitoring to your patients with diabetes?"; "Are your patients with diabetes regularly sent for consults to nephrology/ophthalmology/cardiology?"; "Do you talk to your patients about diabetes publications they may read or of support groups they may attend?" (See Appendix, Table 1).

Subjects.

The revised 50 item scale was mailed to 478 randomly selected health-care professionals in all regions of Quebec. The selected sample worked in various settings: hospitals, private clinics and community health clinics. Four-hundred additional surveys were distributed to health-care professionals through Quebec Diabetes Association conferences. A total of 878 surveys were distributed and 320 were returned for a return rate of 36%. A sample size of

n=320 was considered to be an appropriate one on which to base a data analysis from a 50-item questionnaire yielding 8 reliable factors. Fifty-two percent of the respondents were nurses (62/120), 33% (49/150) were dietitians, 34% (149/433)were physicians, 37% (55/150) were pharmacists, and 20% (5/25) were psychologists. Thirty-one percent of the sample spent ≥ 30% of their professional time working with diabetic patients, which resulted in them being categorized as diabetes specialists for the purpose of this study.

In order to obtain the subsample of physicians for the Diabetes Behaviour Scale (DBS), a total of 283 copies of the 13 question scale and the DAS-R were distributed to specialists (endocrinologists) and nonspecialists (general practitioners) from across the province. All 133 endocrinologists in the province of Quebec received the two scales. Thirty-five specialists returned the questionnaires, for a return rate of 26%. One-hundred and fifty randomly selected general practitioners received the DBS and the DAS-R. Forty-five nonspecialists returned the questionnaires, for a return rate of 30%.

Statistical Methods.

Since a major purpose of this study was to determine the psychometric properties of the revised 9 factor Diabetes Attitude Scale, a variety of statistical analyses were conducted. The internal consistency of each of the 9 subscales was calculated. An item analysis of the scales further helped to eliminate individual items with low item-total correlations. Further, the standard error of measurement (the estimated standard deviation of an individual's score if the scale were administered many times) and related item statistics were calculated

for each of the factor subscales. A score was calculated for each subscale by averaging the items which defined the subscale. These subscale scores were then intercorrelated using Pearson product-moment correlations (Anderson et al., 1990).

Evidence for the validity of the scale as well as its subscales was determined in three ways. First, the content validity of the scale was supported by the panel of diabetes experts. Empirically, validity for the total scale and the individual subscales was examined by testing the hypothesis that the attitudes of physicians, nurses, dietitians, psychologists and pharmacists who specialize in diabetes (i.e. spend $\geq 30\%$ of their time treating diabetic patients) will be in closer agreement to the attitudes of the panel of diabetes experts than health-care professionals who do not specialize in diabetes. This hypothesis was tested by means of a series of one-way analyses of variance (ANOVAs) with specialization (specialist and nonspecialist) as the factor (Anderson et al., 1989).

The second set of hypotheses focused on differences between physicians and allied health care professionals (i.e. nurses, dietitians, pharmacists, and psychologists). This study predicted that physicians, because they are trained as more autonomous decision makers and have the final responsibility for treatment decisions, would have attitudes that differ markedly from other health care professional groups in their support of team care (factor 4), the necessity for special training to treat diabetes (factor 1), and the desirability of a high degree of patient autonomy (factor 3) in self-care. Further, this study predicted that physicians would agree more strongly than other health care professional groups that diabetes is frustrating to treat (factor 6). Donnelly and Anderson (1990), for

example, observed that membership in a particular health-care profession determined the direction of responding on each of the nine scales. Specifically, they found that differences in attitudes between physicians and nurses/dietitians, as reflected by any individual scale, were greater than the differences between nurses and dietitians (Donnelly and Anderson, 1990). We also hypothesized that attitudinal differences would emerge between physician specialists and nonspecialists on specific subscales. These hypotheses were tested with a series of one-way ANOVAs with professional group (nurse, dietitian, physician, psychologist, and pharmacist) as the factor for the between groups comparisons as well as the within groups comparisons (physician specialists versus nonspecialists). The one way analysis of variance was chosen to test these first two hypotheses over the two way analysis of variance because the variables were deemed to be independent of each other, and the sample sizes were unequal. In such a case the one-way ANOVA is the more powerful statistical method. Because the comparisons were independent, the significance level was set at .05 (Anderson et al., 1991). The Tukey Honestly Significant Difference test was used to determine the specific pattern of group differences. It is hypothesized that within group differences will emerge on certain scales in the physician population (specialists versus nonspecialists).

The third set of hypotheses focused on the relationship between physician attitudes and behaviours. If physician attitudes as measured by the DAS-R are important in influencing diabetes management behaviours by physicians, then correlations should occur between the total DAS-R scale and the DBS. Further, it was expected that physician specialists would possess positive attitudes and

behaviours significantly more often than nonspecialists. The existence of a correlation between attitudes and behaviours has important implications for patient self-care. It would be possible to extrapolate from these findings that a positive attitude-behaviour set would influence patient self-care behaviours positively, whereas a negative attitude behaviour set would influence patient self-care behaviours negatively. The third set of hypotheses was tested via a series of Pearson product moment correlations (2-tailed significance).

Chapter 3

Results

Scale Revision and Subscale Definition.

Internal consistencies and item analyses were calculated for each of the 9 factors that were adapted and revised from Anderson's research. Each of the subscales had good Cronbach alpha values (>0.50), except Subscale 4, Patient Compliance (7 items, alpha=0.36). This scale was dropped from further analyses. Item analyses on the individual subscales resulted in the further removal of 6 items which possessed poor item-total correlations: Item 31 (Scale 2), item 9 (Scale 3), item 5 (Scale 8), items 4 and 17 (Scale 6), and item 18 (Scale 7).

The final DAS consisted of 37 items and eight factors. The reliability of the total DAS-R was satisfactory (alpha=.66, 37 items) (See Appendix, Table 2). Table 2 contains the items defining each factor along with their item-total correlations. Factor 1 was labeled Special Training and indicates the extent to which respondents believe that health care professionals need special training to care for persons with diabetes (Anderson et al., 1989). Factor 2 was called Relationship Between Blood Glucose Control and Complications and is about the relationship between the degree of glucose control and the subsequent onset of complications. Factor 3 was called Patient Autonomy and indicates the extent to which respondents agree that the patient should be the primary decision maker regarding the daily self-care of diabetes (Anderson et al., 1990). Factor 4 was called Team Care and is concerned with the efficacy of team care in treating

diabetic patients (Anderson et al., 1989). Factor 5 was labeled Seriousness of NIDDM and indicates the extent to which the respondents view NIDDM as a serious disease (Anderson et al., 1990). Factor 6, Difficult to Treat, represents the perception that diabetes is frustrating to treat (Anderson et al., 1991). Factor 7 was labeled Outpatient Education and is a highly specific factor addressing the issue of whether patient education is best conducted in an outpatient or inpatient setting. Factor 8, was labeled Emotional Impact of Diabetes on Patients' Lives and measures the extent to which health care professionals are aware of the emotional impact of diabetes on patients' lives.

In comparison to its parent scale, the DAS-R yielded improved reliabilities on the three following subscales: Factor6, NIDDM (alpha=.72), Factor 7, Difficult to Treat (alpha=.64), and Factor 1, Special Training (alpha=.77). The two scales were similar in structure, however, Scale 4 (Compliance) was excluded from the DAS-R, while Scale 9 (Emotional Impact) was excluded from the DAS (See Table 3).

Descriptive statistics (means, standard deviations, standard errors, and ranges) and Cronbach alphas for each of the factorially defined subscales are presented in Table 4. Mean scores above 3 on Scales 1, 2, 3, 4, 7, 8 are reflective of a positive attitude (answering positively, or with a high score to indicate agreement, is reflective of a positive attitude). Positive attitude refers to agreement with expert opinion, negative, with the reverse. However, because Scales 5 and 6, unlike the other scales, have been constructed as "reverse scored" (that is, answering negatively,

Table 3. Comparison of DAS-R (1994) and DAS (1989).

FACTOR	SCALE			
	DAS		*DAS-R*	
	Item #	*Alpha*	*Item #*	*Alpha*
1, Special Training	7	.75	7	.77
2, Control/Complications	4	.69	3	.59
3, Patient Autonomy	5	.66	5	.60
4, Patient Compliance	3	.49		
5, Team Care	4	.71	5	.66
6, Seriousness of NIDDM	3	.54	4	.72
7, Difficult to Treat	3	.40	6	.64
8, Outpatient Education	2	.52	3	.58
9, Emotional Impact			4	.53
TOTAL	31	.78	37	.66

or with a low score to indicate disagreement, is reflective of a positive attitude) scores below 3 are indicative of a positive attitude. In general, the majority of respondents agreed that: HCPs need special training to care for persons with diabetes (Scale 1); a team care approach to diabetes care is necessary (Scale 4); patients are capable of making treatment-related decisions (Scale 3); NIDDM is a serious disease (Scale 5); good blood glucose control reduces the likelihood that complications will develop (Scale 2); diabetes is not frustrating to treat (Scale 6); and that diabetes has an emotional impact on patients' lives (Scale 8). Respondents were not in concensus regarding whether patient education is best conducted in an outpatient setting.

Table 4 also presents the reliabilities and related standard errors of measurement for the eight subscales. The reliabilities ranged from 0.53 for the emotional impact of diabetes scale (4 items) to 0.77 for the need for special training (7 items). These reliabilities were viewed as adequate for making group comparisons.

Pearson product-moment correlations for the ten subscales are presented in Table 5. The strongest correlation between the subscales was between the need for special training and the need for a team care approach towards the treatment of diabetes ($r = 0.54$). The remaining correlations were low to moderate indicating that the subscales were measuring relatively independent attitudes, although it is recognized that the subscale reliabilities are attenuating these correlations to some degree.

Table 4 Descriptive statistics for subscales

Subscale	Number of Items	Mean	SD	Range	Cronbach's Alpha	SE
Factor 1, Special Training	7	4.08	0.61	1.14 - 5.00	0.77	0.03
Factor 2, Seriousness of NIDDM	3	4.43	0.53	2.33 - 5.00	0.59	0.03
Factor 3, Patient Care/Self-Care	5	3.83	0.62	1.80-5.00	0.6	0.03
Factor 4, Patient Autonomy	5	4.31	0.53	1.00-5.00	0.66	0.03
Factor 5, Seriousness of Diabetes	4	1.86	0.76	1.00-4.75	0.72	0.04
Factor 6, Control/Complications	6	2.43	0.62	1.00 - 4.17	0.64	0.03
Factor 7, Difficult to Treat	3	3.21	0.83	1.00 - 5.00	0.58	0.05
Factor 8, Difficult/Noncompliant Patients	4	4.13	0.57	2.00 - 5.00	0.53	0.03
TOTAL	37	3.53	0.26	2.43 - 4.41	0.66	0.01

n=320

Diabetes Behaviour Scale (DBS).

An item analysis of the DBS revealed that 7 of its items had low item total correlations with the scale. These items were dropped from the scale. The 6-item DBS (items 1, 2, 3, 6, 9, 12) had a sufficiently high internal consistency, for a measurement of behaviour, (alpha=.48) to be utilized for further analyses.

Validity.

The analyses examining the first set of hypotheses indicated that specialists in diabetes had significantly ($p < .05$; See Table 6) higher mean scores on five of the eight subscales: Special Training (Factor 1), $F(1, 318)=24.11$, $p<.05$; Control/Complications (Factor 2), $F(1,318)=8.61$, $p < .05$; Team Care (Factor 4), $F(1, 318)=29.38$, $p< .05$; Outpatient Education (Factor 7), $F(1, 318)=24.28$, $p<.05$; Emotional Impact (Factor 8), $F(1, 318)=3.90$, $p<.05$. In addition specialists had significantly lower scores on one of the eight subscales due to the reverse scoring nature of this scale: Seriousness of NIDDM (Factor 5), (Factor 5), $F(1, 318)=34.48$, $p< .05$. There were differences between specialist and nonspecialist health care professional groups in the overall DAS-R score, $F(1, 318)= 17.09$, $p< .05$ (See Table 6). In all cases, specialists were in agreement in the direction of expert opinion.

Table 5 Pearson product-moment correlations between subscales

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8
Factor 1, Special Training								
Factor 2, Control/Complications	0.34							
Factor 3, Patient Autonomy	0.20	0.09						
Factor 4, Team Care	0.54	0.31	0.29					
Factor 5, Seriousness of NIDDM	-0.24	-0.20	-0.15	-0.29				
Factor 6, Difficult to Treat	-0.17	-0.09	-0.12	-0.16	0.26			
Factor 7, Outpatient Education	0.05	0.15	0.11	0.00	-0.20	-0.16		
Factor 8, Emotional Impact	0.35	0.24	0.28	0.43	-0.21	-0.03	-0.13	

Table 6 Mean scores for total scale and subscales by specialization

Scale	Specialization		F
	Specialist (n=99)	Nonspecialist (n=221)	(sig.*, P<.05)
Total	3.62±.21	3.49±.27	17.09*
Special Training	4.32±.47	3.97±.63	24.11*
Control/Complications	4.56±.46	4.37±.54	8.61*
Patient Autonomy	3.92±.57	3.79±.64	2.87
Team Care	4.54±.44	4.20±.54	29.38*
Seriousness of NIDDM	1.50±.63	2.02±.76	34.48*
Difficult to Treat	2.36±.61	2.47±.62	2.18
Outpatient Education	3.54±.90	3.06±.75	24.28*
Emotional Impact	4.22±.54	4.09±.57	3.90*

The analyses for the second set of hypotheses indicated that physicians had significantly lower mean scores than most other professionals on the necessity for special training to treat diabetes (Factor 1), $F(4, 315)=30.22$, $p<.05$; the desirability for a high degree of patient autonomy in self-care (Factor 3), $F(4, 315)=8.52$, $p<.05$; the need for team care in the treatment of diabetes (Factor 4), $F(4, 315)=9.85$, $p<.05$; and the emotional impact of diabetes in patients' lives (Factor 8), $F(4, 315)=3.70$, $p<.05$. Physician scores were significantly lower in comparison to all groups except psychologists on Factor 1, all groups except psychologists and pharmacists on Factors 3 and 4, and only in comparison to dietitians on Factor 8 (See Table 7). Results also determined that physicians agreed more strongly that diabetes is frustrating to treat (Factor 6), $F(4, 315)=7.15$, $p<.05$; and agreed less strongly that NIDDM is a serious disease (Factor 5), $F(4, 315)=3.38$, $p<.05$ (See Table 7). Physician scores were significantly higher in comparison to nurses and dietitians on Factors 6 (reverse scoring, where high scores are indicative of negative attitudes) and significantly higher than dietitian scores on Factor 5 (reverse scoring) (See Table 7).

Physician nonspecialists indicated lack of consensus regarding the need for special training to treat diabetes, while physicians specialized in diabetes care agreed with the need for special training, $F(9, 310)=19.18$, $p<.05$ (See Table 8). Further, while physician nonspecialists were not in concensus regarding the efficacy of patient education in an outpatient setting, physician specialists agreed with this concept, $F(9, 310)=3.90$, $p<.05$. Although both physician specialists and nonspecialists in diabetes care agreed that NIDDM is a serious disease,

Table 7 Mean scores for total scale and subscales by professional group

Scale	Professional Group					F
	Physician (n=149)	Nurse (n=62)	Dietitian (n=49)	Psychologist (n=5)	Pharmacist (n=55)	(sig.*, P<.05))
Total	3.46±.24	3.63±.28	3.68±.18	3.55±.26	3.50±.24	10.79*
Special Training	3.76±.58	4.38±.44	4.54±.35	4.26±.68	4.18±.52	30.22*
Control /Complications	4.38±.57	4.45±.55	4.58±.39	4.27±.55	4.42±.45	1.45
Patient Autonomy	3.71±.63	3.99±.59	4.18±.46	4.07±.60	3.64±.61	8.52*
Team Care	4.19±.56	4.44±.41	4.65±.35	4.40±.45	4.17±.56	9.85*
Seriousness of NIDDM	1.91±.79	1.86±.77	1.52±.59	1.70±.74	2.02±.75	3.38*
Difficult to Treat	2.60±.63	2.31±.64	2.13±.48	2.10±.45	2.41±.55	7.15*
Outpatient Education	3.19±.75	3.19±.92	3.46±.99	3.87±.69	3.02±.70	2.74*
Emotional Impact	4.04±.63	4.26±.47	4.32±.43	3.85±.74	4.07±.53	3.70*

physician specialists were stronger in their agreement that NIDDM is a serious disease, $F(9, 310)=5.26$, $p<.05$ (See Table 8). Both physician groups also agreed with the need for a team care approach to diabetes treatment, however physician specialists agreed with this need significantly more strongly than their nonspecialist colleagues (See Table 8).

The analyses for the third set of hypotheses indicated that there was no correlation between the attitudes and behaviours of physicians in the management of their patients with diabetes ($r= -.08$, $p >.05$). The attitudes of physician specialists ($r = -.19$, $p > .05$) and nonspecialist ($r = .12$, $p > .05$) also did not correlate significantly with their diabetes management behaviours. These results may imply that positive attitudes are not necessarily followed by ideal physician management behaviours, and similarly, negative attitudes are not necessarily followed by inadequate physician management behaviours. However, there were significant negative correlations between two DAS-R subscales and the DBS (Subscales 1 ($r = -.49$, $p < .05$) and 4 ($r = -.25$, $p < .05$)) (See Table 9). This finding not only contributes further toward the validity of the DAS-R, but also demonstrates that health care professionals holding positive attitudes regarding the need for special training in diabetes care and team care also behave positively with respect to their daily management of patients with diabetes. In light of these results, it appears that there is evidence for the validity of the eight DAS-R subscales (Factors 1, 2, 3, 4, 5, 6, 7, 8) as well as the total scale the total scale.

TABLE 8. Subscale Comparisons of Physician Specialists and Nonspecialists Attitudes

	SPECIALIST GROUP		F
FACTOR	*Physician Specialists*	*Physician Nonspecialists*	(sig.*,p < .05)
1, Special Training	4.07±.47	3.62±	19.18*
4, Team Care	4.50±.39	4.05±	8.27*
5, NIDDM	1.57± .67	2.06±	5.26*
7, Outpatient Education	3.50± .77	3.04±	3.90*

Table 9. Correlation Coefficients Between DAS-R and DBS

DAS-R Scale	DBS (specialists and nonspecialists)
Total	-.08
Subscale 1	-.49*
Subscale 2	-.19
Subscale 3	.13
Subscale 4	-.25*
Subscale 5	.24
Subscale 6	.13
Subscale 7	.33*
Subscale 8	-.06

*indicates a significant result, $P<.05$

Chapter 4

Discussion

Psychometric Properties of the DAS-R and DBS.

Our intent was to develop a revised French version of Anderson et al.'s (1989) DAS and to improve its psychometric properties. Indeed, a French version of the DAS was developed, its scales measuring aspects of attitudes toward diabetes care which are quite similar to its parent scale. We developed the scale based on the DAS' 8 factor solution. Thus, the questions representing each of the eight scales (total of 34 items from Anderson's DAS, each classified as belonging to one of the eight scales) served as a prototype from which we could attempt to improve subscale and total scale reliability . A ninth scale, Emotional Impact of Diabetes inspired from scale 5 of Anderson's DAS for patients (4 items) was added to the predetermined 8 scale structure, and 27 scale definition-appropriate items were also created in an attempt to improve reliability. The DAS-R is similar to its parent scale in that 7 of its eight scales measure identical aspects of attitude. However, the scale differs from the DAS in that its eighth scale measures awareness in health care professionals regarding the emotional impact of diabetes on patients' lives. Only scales 1 and 8 are exact replicates of Anderson's previous work in that all of the items in these scales correspond with items in scales composed by Anderson et al. (1989). The other scales are not replicates since they contain items created by the Notre Dame diabetes educators as well as containing some items from the DAS. Compared with the DAS, there were improvements in reliability on 4 of the subscales.

Further, unlike the DAS, none of the DAS-R scales possessed less than 3 items, and none of the scales had Cronbach alpha values of less than 0.5.

The use of a panel of diabetes experts to develop the items and the psychometric analyses conducted on the revised DAS provide preliminary support for its content validity and reliability as a general measure of the diabetes-related attitudes of health-care professionals (Anderson et al., 1990).

Further, because the DAS-R was administered to a more heterogeneous population than the DAS (population consisting of pharmacists, psychologists, dietitians, nurses, and doctors, many of whom were not members of diabetes organizations), additional evidence has been provided regarding the validity and reliability of this measurement instrument. The improvement in validity is evident on certain subscales, where larger magnitudes exist in attitudinal diferences between health care professional groups than in Anderson's sample of respondents.

This study did shed some light on this ever-present, "questionable validity" issue by finding significant health care professional group differences and specialist differences . However, because a solid theoretical foundation on which to base predictions regarding differences in attitudes among physicians, nurses, dietitians, pharmacists, psychologists, or diabetes specialists and nonspecialists was absent, hypotheses involving group differences that appeared to have face validity were used (Anderson et al., 1989). Further, evidence was provided for the construct validity of the scale through the development of the DBS.

The premise was that if correlations were found between the DAS-R and DBS (between the diabetes-related attitudes and behaviours of physicians as measured

by these scales respectively), then further evidence for the validity of the DAS-R would have been provided. Indeed, the DBS provides validity for two of the subscales of the DAS-R (Scales 1and 4). The correlations found between attitudes and behaviours on these subscales are quite consistent with Ajzen and Fishbein's theory of reasoned action.

The DBS has moderate reliability and face validity. However, this scale possesses a limited number of questions and these have been normed on a relatively small sample of physicians. Furthermore, while these questions were believed to measure diabetes-related behaviours by our diabetes experts, they had no theoretical basis. Further studies on this instrument are needed to improve its psychometric properties. Future research on this topic might include increasing the number of questions that compose the DBS and the range of behaviours that it measures, validating it on a larger population of physicians, and writing questions based on theory concerning diabetes-related physician behaviour.

The reliability (Cronbach's alpha) of the total DAS-R scale was satisfactory (alpha= 0.66). Subscales that were most reliable, as well as important conceptually, included: Attitude Towards Need for Special Training, Attitude Towards Seriousness of NIDDM, and Team Care. In using the revised DAS it must be noted that the subscales with low reliability (especially scales 2, 7, 8 since their alpha values are near 0.5) should be used with caution for detecting differences in scores between individual health care professionals but may be used with confidence to compare the attitudes of large groups of health care professionals (Anderson et al., 1990).

The mediocre reliabilities of the Outpatient Education, Emotional Impact, and Control/Complications subscales was most likely a function of the small number of items that define these subscales (Anderson et al., 1989). To raise these reliabilities, additional items would have to be written for each of these subscales, and the scale administered to a larger sample size (greater than n=320) (Anderson et al., 1989). Further, Anderson found that the way items are worded can actually produce significant changes in health care professional scores on the items (Anderson & Donnelly, 1990). Thus, future research on this scale would have to carefully consider the impact of wording changes and how they will impact scores.

Differences in the Overall DAS-R Score by Specialization

There were differences between specialist groups, in the overall DAS-R score. The nonspecialist health care professional scores were close to the scale's midpoint, indicating lack of consensus with the items in the scale, while specialists indicated general agreement with the items describing the total scale.

Differences Within Subscales by Specialization and Health Care Professional Group.

Need for Special Training (Scale 1).

Not surprisingly, diabetes specialists (who have undergone special training) were stronger than nonspecialists in their agreement with the need for special training to treat diabetes (Anderson et al., 1991). Interestingly, while physician nonspecialists were not in consensus regarding the need for special

training to treat diabetes, physicians specialized in diabetes care agreed with the items on this scale. This may have to do with the fact that specialists are more knowledgeable in the field and would be more likely to see the value of special training than nonspecialists Also, nurses, dietitians, and pharmacists were stronger in their agreement with this subscale than were physicians. The differences between physicians versus nurses, dietitians, and pharmacists may reflect the fact that one of the items in this subscale referred to the efficacy of mandatory continuing education in order to treat diabetes (Anderson et al., 1991). The difference regarding special training probably reflects the fact that physicians are trained to be independent and autonomous practitioners (Donnelly and Anderson, 1990). Also, two of the items refer to educational skills that may be of more interest to nurses, dietitians and pharmacists than to physicians.

Relationship Between Blood Glucose Control and Complications (Scale 2)

There were no meaningful differences among health care professional groups on this subscale. The scores tended toward the upper part of the scale, indicating that all groups acknowledged, to some extent, the existence of a relationship between blood glucose control and complications. Although both specialists and nonspecialists agreed with the need for blood glucose control as a method of deterring the potential complications of diabetes, specialists in diabetes care agreed significantly more with the items representing this scale.

Attitude Towards Patient Autonomy (Scale 3)

There were no meaningful differences between specialists and nonspecialists on this subscale. However, there was a strong difference between the attitudes of physicians versus nurses and dietitians (Anderson et al., 1991). Nurses and dietitians were much stronger in their support for patient autonomy than were physicians (Anderson et al., 1991) . Further, while the scores of physicians were close to the scale's midpoint, indicating lack of consensus with the items of this scale, nurses and dietitians agreed with the idea that patients should be allowed to choose their own goals for diabetes treatment. This may be because physicians are inclined to accept responsibility for the treatment of their patients while nurses and dietitians are often responsible for teaching patients self-care skills that involve problem solving and independent decision making (Anderson et al., 1991).

Team Care (Scale 4)

Although both diabetes specialists and nonspecialists agreed with the idea of a team care approach toward diabetes care, specialists agreed significantly more strongly with this concept (See Table 18). Further, while physicians were not in consensus regarding the application of a global treatment approach toward diabetes care, nurses and dietitians supported a global treatment approach toward patients with diabetes. Interestingly, while both physician specialists and nonspecialists agreed with the need for team care in diabetes treatment, specialists agreed significantly more strongly with this concept. The idea behind this approach is that diabetes care should be a holistic process. This involves a

team of diabetes specialists who educate and motivate patients toward acquiring problem solving and independent decision making skills regarding such daily self-care behaviours as nutritional choices, blood glucose monitoring, insulin injections, and stress management. Unique to this treatment approach is that the emotional impact of diabetes on the patient is taken into account by health care professionals, and that the patient's autonomy toward reaching treatment decisions is valued.

The team approach to diabetes is more realistic in settings in which the health care professionals are diabetes specialists, which may explain the diabetes specialists stronger agreement with this subscale (Anderson et al., 1991). In most community primary health care settings, where diabetes may represent a relatively small percentage of the patient load, team care is usually not feasible (Anderson et al., 1991). Although primary care physicians can refer patients to nurse educators and dietitians, such referrals constitute team care only in the broadest sense (Anderson et al., 1991). This is in contrast to diabetes specialty centers in which physicians, nurses, dietitians, pharmacists and psychologists may meet as a team and coordinate the care of individual patients.

A team care approach to diabetes care also received much stronger support from nurses and dietitians than from physicians. That is, nurses and dietitians were more inclined to agree with the tenets of the comprehensive team care approach (caring for physiological and psychological aspects of diabetes; educating patients to become full participants in their treatment decisions) than were physicians. This may indicate that nurses and dietitians are more inclined as a result of their training to participate on health care teams than are physicians

who are oriented toward autonomous practice (Anderson et al., 1991). This finding suggests that models of diabetes care developed at diabetes specialty centers may not be feasible or may have to undergo significant adaptation prior to their application in community primary care settings (Anderson et al., 1991).

Attitude Towards Seriousness of NIDDM (Scale 5)

Strong differences between specialists and nonspecialists were found on this subscale. Diabetes specialists were stronger in their agreement that NIDDM is a serious disease than were nonspecialists (Anderson et al., 1991). Although both groups felt to some extent that NIDDM is a serious disease, the specialists' score reflected that they were more concerned about the effects of NIDDM than were nonspecialists. Physician specialists scores also reflected that they were more concerned about the effects of NIDDM than were physician nonspecialists. Although both physician specialists and nonspecialists in diabetes care agreed that NIDDM is a serious disease, physician specialists were stronger in their agreement that NIDDM is a serious disease. This may be because specialists are more familiarized with the treatment and effects of NIDDM than are nonspecialists. Also, dietitians were stronger in their agreement that NIDDM is serious than were physicians. This may be because the treatment of NIDDM is often focused on trying to convince patients to make difficult life-style changes (Anderson et al., 1991). Promoting such changes is often viewed as the responsibility of nurses and dietitians, and may influence their perception of the seriousness of NIDDM (Anderson et al., 1991).

Difficult to Treat (Scale 6)

There were no significant differences between specialists and nonspecialists on this subscale. Both groups agreed that diabetes is not frustrating to treat. We can extrapolate that health care professionals are becoming more educated about the physiological and psychological intricacies involved in caring for patients with diabetes, and are therefore not finding diabetes as frustrating to treat as a decade ago.

Although all groups indicated that they did not agree that diabetes was difficult to treat, nurses and dietitians held to this belief more strongly than did physicians . This may be because the physician's treatment role, unlike the dietitian's and nurse's educational role toward the patient, places him/her at greater risk for feeling frustrated by problems that may arise in the course of treatment (i.e. ineffective management strategies in the face of brittle diabetes, or noncompliant patients).

Outpatient Education (Scale 7)

Nonspecialists were not in concensus regarding the need for outpatient education in the treatment of diabetes, while specialists agreed with this concept. Similarly, physician specialists agreed significantly more strongly than nonspecialists that outpatient education is a useful tool in the treatment of diabetes.

The goals of outpatient education include: Reducing diabetes complications (ketoacidosis, hyperglycemic syndrome), decreasing foot problems, diminishing hospitalization, and improving long-term glycemic control.

Outpatient education clinics generally use a biopsychosocial treatment approach to diabetes care. This model involves: (1) Providing knowledge on the specific aspects of the disease and the treatment regimen; (2) Developing therapeutic goals with the patient based on their personal level of responsibility and values; (3) Creating a supportive environment. The health care professional engages in an empathic two-way relationship and enables the patient to vent his feelings and fears about having diabetes.

Emotional Impact of Diabetes (Scale 8)

While specialists and nonspecialists agreed that diabetes can have a negative emotional impact on patients' lives, diabetes specialists believed this significantly more than nonspecialists. Physician scores were significantly lower than those of dietitians, however both groups agreed that diabetes has an emotional impact on patients' lives. This finding implies that health care professionals take diabetes seriously and that they recognize the emotional impact that the disease may have on patients due to lifestyle changes including the need to adapt to the rigorous treatment regimen, and increased daily stress due to the potential for the development of acute and long term complications.

Differences in Scores Between Subscales.

Health care professionals responding to the DAS-R expressed agreement with the idea that diabetes has a negative emotional impact (Scale 8) on a patient's life. This finding indicates that diabetes educators are aware of the emotional impact that certain self-care management behaviours (i.e.

administering insulin) have for patients. Most respondents generally agreed that NIDDM was a serious disease (Scale 5). The NIDDM score indicates that most respondents are aware of the symptoms and complications of NIDDM, and believe that treatment of this disease should be taken as seriously as the treatment of persons with insulin dependent diabetes mellitus (IDDM).

Respondents agreed that special training (Scale 1) and a team care approach (scale 4) were necessary dimensions of diabetes care. They further agreed that there is a relationship between blood glucose control and the onset of complications (Scale 2). This finding is viewed as positive because these scales represent concepts that have been widely promoted by the diabetes community in North America. The need for special training to treat diabetes has been explicitly and implicitly supported by national efforts to increase the availability and quality of diabetes continuing professional education (Anderson et al., 1991). Indeed, in the fall of 1991, the first Canadian Diabetes Educator Certification Examination was completed (McLeod and Benoit, 1992). To date, there are 325 certified diabetes educators in Canada including nurses, dietitians, social workers, pharmacists and doctors (McLeod and Benoit, 1992). They work in diabetes education centres, hospitals, community health agencies, pharmacies and private practice, devoting some or all of their time to diabetes education (McLeod and Benoit, 1992).

Although respondents agreed with aspects of the biopsychosocial approach to diabetes care, they were not in concensus regarding the efficacy of diabetes treatment in an outpatient setting. This finding may imply that some health care professionals may still believe that hospitalization is an effective

method of teaching patients in certain cases (i.e. Elderly diabetics and patients with insulin dependent diabetes mellitus who have been diagnosed with diabetes)

The control and complications subscale score indicates that although the evidence regarding the relationship of glycemic control and complications is still incomplete, there is widespread agreement that rigorous glucose control can contribute to a reduction in the complications of diabetes (Anderson et al., 1991).

The subscale score regarding a team care approach suggests strong support for holistic intervention in diabetes care. A holistic approach to diabetes care involves: assessing the emotional and physiological impact of a chronic illness on the patient through health care professional education in the field of doctor-patient relationships, interpersonal communication, and educational strategies (Assal, 1991).; establishing an effective diabetes team that can empower, motivate, and educate patients toward fulfilling daily self-care activities involving problem solving and independent decision making. Each member of the diabetes team ideally has a specific area of expertise that he/she can empower the patient to gain knowledge and control in. Members of a health care team may include a physician, nurse, dietitian, psychologist and pharmacist. The physician is skilled in medical management and pathophysiology of diabetes (Fylling, 1986). The nurse should be skilled in patient education techniques and evaluation of learning : teaching insulin injection procedure, self blood-glucose monitoring, prevention and treatment of insulin reactions, footcare, and prevention of chronic complications, and evaluation of the equipment needed by the patient to implement these management processes (Fylling, 1986). The dietitian is skilled in nutritional management of diabetes, arranging the calorie

and nutrient requirements for growth, development and maintenance of desirable weight, the impact of food upon blood glucose levels, and individualizing the diabetic diet (Fylling, 1986). The psychologist or social worker helps individuals identify emotional problems and to live with a chronic illness (Fylling, 1986). The pharmacist knows the interaction of medications in diabetes management and can reinforce teaching about the use of medication (Fylling, 1986).

Health care professionals also disagreed with the items on scales 6 and 3. That is, they indicated that diabetes is not frustrating or difficult to treat (scale 6), and that they believe it is possible for diabetic patients to be in control of self-care behaviours such as blood glucose monitoring and dietary regimen (scale 3). These findings are positive because they indicate that in general health care professionals are positive toward diabetic patients and their ability to achieve self-care goals. Further health care professionals themselves , are not feeling overwhelmed by the intricacies of patient care. Such favourable attitudes may have been influenced by an increasing emphasis in the medical community during the past decade concerning the importance of diabetes patient education and the continuing medical education of health care professionals in the area of diabetes care (through symposia, workshops, journals).

Weaknesses and Limitations of the Present Study.

A limitation of this study involves the manner in which the attitude/behaviour relationship was investigated. Specifically, we asked whether such a relationship existed via the use of the questionnaire. Although a convenient and direct way of obtaining information, people's responses to

questionnaires may reflect how they ideally feel or behave, and not how they actually feel or behave. Future studies could remedy this problem by assessing or measuring the diabetes management behaviours of physicians in real-life situations. For example data from hospital quality assurance programs could be used as a means of assessing the behavioural practices of physicians towards their patients.

The statistical analyses and interpretations based on the specialists and nonspecialist psychologists as well as the pharmacist specialists should be accepted with caution since their population representation in the study sample was not adequately large. Further research on the DAS-R might concentrate on increasing the sample sizes of these groups.

This research may have also benefited from the inclusion of a pilot study of the DAS-R as a means of determining item selection. For example, the original 65 items which had been generated by the hospital specialist team could have initially been mailed to a small population of health care professionals. After a reliability analysis of this preliminary version, certain items would have been dropped. Then this new version of the scale would have comfortably been distributed to a large sample size of health care professionals.

Summary

The revised DAS is an instrument that can be used to measure a variety of relatively independent attitudes of health care professionals (Anderson et al., 1991). The diabetes-related attitudes of health care professionals are worthy of investigation, because in the face of uncertainty and partial evidence, health care professionals must make important and choices about caring for diabetic patients (Anderson et al., 1989). Those choices are most likely influenced by the health care professionals' attitudes about various diabetes care issues such as the efficacy of good glucose control, global treatment approach, and autonomous patient self-management (Anderson et al., 1989).

The reliabilities of the DAS-R subscales, although modest, are adequate for group comparisons (Anderson et al., 1991). The revised DAS can be used to compare the attitudes of health care professional groups to each other (Anderson et al., 1991). The DAS-R can also be used to assess the impact of diabetes education on the diabetes-related attitudes of health care professionals (Anderson et al., 1989).

The use of an overall attitude score or subscale scores should be matched to the objectives of the intervention that it is used to evaluate (Anderson et al., 1989). Use of particular subscales allow for a more precise evaluation of a given program (Anderson et al., 1989). For example, an educational program promoting good glucose control or a team care approach could include the relevant DAS-R subscales as part of the program evaluation (Anderson et al,

1989). The total score indicates the degree to which the respondent tends to agree or disagree with the panel of experts about the diabetes-related attitudes in the DAS-R (Anderson et al., 1989).

Although the DBS requires further development as a psychometrically sound instrument, the two DAS-R subscales found in this study to correlate with it can be used to describe the relationship between specific attitudes and the diabetes-related behaviour of physicians. This study has demonstrated that certain attitudes influence diabetes management behaviours. We could therefore extrapolate that positive health care professional attitudes would prove invaluable toward improving patient compliance. Compliance in patients with diabetes could be greatly enhanced through their acquisition of a set of coping and self-care skills from a diabetes care team who are versed in the empowerment education model. A positive, empathic and knowledgeable health care professional could enable the person with diabetes to become empowered. And for the diabetic, this means that he/she has not only gained self-management skills, but also improved quality of life, emotional support and more importantly a sense that diabetes no longer rules his/her life.

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APPENDIX

Table 1. The Diabetes Behaviour Scale

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1. Recommandez-vous l'auto-surveillance des glycemies capillaires a vos patients atteints de diabete?

   Do you recommend glucose self-monitoring to your patients with diabetes?

2. Au cours de la derniere annee, avez-vous participe a des congres ou a des ateliers specialisees sur le diabete?

   In the last year, have you attended any diabetes confrences or workshops?

3. Lisez-vous des publications sur le diabete?

   Do you read diabetes journals?

4. Avez-vous jamais oriente des patients vers un programme d'eduaction externe sur le diabete?

   Have you ever referred any of your diabetic patients to an outpatient education program or day care center?

5. Suggerez-vouz a vos patients diabetiques des consultations en nephrologie / ophtalmologie / cardiologie ou autre?

   Are you patients with diabetes regularly sent for consults to nephrology/cardiology/opthalmology?

6. Est-ce que vous referez vos patients diabetiques qui ont des difficultes psychologiques (troubles d'acceptation, anxiete, depression, etc.) a un psychologue ou a un psychiatre?

   Do you refer diabetic patients with psychological difficulty (anxiety, depression, trouble accepting the disease) to the psychologist/psychiatrist?

7. Vos patients peuvent-ils vous rejoindre par telephone n'importe quand (ou votre remplacant)?

Do you allow patients access to you/your locum by phone at all times?

8. Expliquez-vous a vos patients qu'il existe des publications sur le diabete qu'ils peuvent lire, ou des groupes de soutien (section de l'ADQ) dont ils peuvent faire partie?

   Do you talk to your patients of diabetes publications they may read or of support groups (of the QDA) they may attend?

9. Participez-vous a un programme de perfectionnement ou de formation continue dans le domaine du diabete?

   Are you involved in any form of continuing medical education which concerns diabetes?

10. Au besoin referez-vous vos patients a un endocrinologue?

    Do you consult with/refer to endocrinologists?

11. Etes-vous membre de l'Association du diabete du Quebec?

    Are you a member of the Quebec Diabetes Association?

12. Informez-vous vos patients de leurs resultats d'hemoglobine glycosylee (HbA1C) ou de fructosamine?

    Is blood glucose profile data discussed with the patients at each visit?

13. Tenez-vous compte des style de vie des patients dans le choix de leur plan de traitement?

    Do you consult with your patients in deciding their treatment plan?

Table 2 Item statistics for 37-item Diabetes Attitude Scale

	Mean ± SD	Item-Total Correlation
Factor 1: Special Training		
1... Il est necessaire d'avoir une formation specialisee pour fournir un traitement efficace du diabete au niveau des soins de sante de premiere ligne. It is necessary to have special training to provide effective primary treatment of diabetes.	3.35±1.41	.42
13...Il est important pour les educateurs en diabete d'apprendre des habiletes de counseling. It is important for diabetes educators to learn counseling skills.	4.35±.69	.49
14...Une formation continue sur le diabete devrait etre obligatoire pour les intervenants de la sante de premiere ligne en raison des progres rapides des connaissances dans ce domaine. Continuing education about diabetes should be mandatory for primary health care providers because of the rapid advances occurring in the field.	4.17±.93	.57
33...Une formation specialisee sur le diabete des professionnels de la sante consultants (ophtalmologue, cardiologue, nephrologue, etc.) aboutit a de meilleurs soins aux patients. Specialized diabetes training for allied health care professionals (opthalmologists, cardiologists, nephrologists, etc.) results in better care for patients.	4.15±.89	.45
45...Pour etre efficaces, les educateurs en diabete doivent maitriser une somme substantielle de connaissances sur l'education et l'apprentissage. To be effective, diabetes educators must master a substantial body of knowledge on teaching and learning.	4.19±.82	.54
46...La formation professionnelle sur le diabete devrait inclure le diabete chez la personne agee. Diabetes professional education should cover diabetes in the elderly.	4.42±.64	.47

47...Les professionnels de la sante qui traitent les personnes atteintes de diabete ont besoin d'une formation sur les habiletes de communication. Health care professionals who treat people with diabetes need training in communication skills.	3.93±.99	.63
Factor 2: Control/Complications		
15...Les personnes atteintes de diabete qui maintiennent un mauvais controle glycemique ont plus de risques de developper des complications que les personnes qui maintiennent un bon controle glycemique. People with diabetes who maintain poor glucose control are more likely to have complications than people who maintain good glucose control.	4.62±.61	..42
23...Un bon controle glycemique diminue la manifestation des complications a long terme du diabete. Good glucose control will diminish the development of long-term diabetes complications.	4.35±.78	.38
44...Il y a une relation entre l'hyperglycemie chronique et la manifestation des complications a long terme du diabete. There is a relationship between chronic high blood glucose and the onset of long-term diabetes complications.	4.31±.72	.43
Factor 3: Patient Autonomy		
32...Les personnes atteintes de diabete ont le droit de decider jusqu'a quel point elles vont s'impliquer dans le controle de leur diabete. People with diabetes have the right to decide how aggressively they work to contrrol their blood glucose.	3.89±.97	.35
38...Seul le medecin devrait decider la gestion du traitement du diabete. Decisions about managing diabetes should be made by the physician only.	4.16±.97	.29
40... Les personnes atteintes de diabete devraient prendre elles-memes les decisions importantes concernant le traitement de leur diabete. The important decisions regarding daily diabetes care should be made by the individuals with diabetes.	3.41±1.13	.48

12...Les personnes atteintes de diabete devraient choisir leurs objectifs personnels dans le traitement de leur diabete. People with diabetes should choose their own goals for diabetes treatment.	3.74±1.01	.41
42...Les personnes atteintes de diabete devraient acquerir une expertise sur leur diabete afin d'exercicer une pleine autorite au niveau de decisions concernant leur traitement. People with diabetes should acquire an expertise on their diabetes in order to have full authority concerning treatment decisions.	3.97±.92	.27
Factor 4: Team Care		
27...Le diabete est une maladie tres serieuse. Diabetes is a very serious disease.	4.58±.61	.33
3...Les personnes ayant des problemes a accepter leur diabete devraient pouvoir beneficier de l'expertise d'un travailleur social ou d'un psychologue. Patients who have problems accepting their diabetes should be able to benefit from the expertise of a social worker or a psychologist.	4.28±.83	.33
41...Les medecins devraient avoir recours a l'expertise d'une infirmiere enseignante dans le traitement des personnes atteintes de diabete. Physicians should employ the expertise of a nurse educator in treating people with diabetes.	4.04±.91	.50
26...Les medecins devraient avoir recours a l'expertise d'une dietetiste dans le traitement des personnes atteintes de diabete. Physicians should employ the expertise of a dietitian in treating people with diabetes.	4.53±.68	.52
30...Le traitement du diabete, au niveau primaire, ne require pas une equipe multidisciplinaire. The primary treatment of diabetes does not require a diabetes care team.	4.12±.99	.45
Factor 5: Seriousness of NIDDM		
7...Un diabete qui peut etre controle uniquement par une diete est une maladie peu serieuse.	1.93±1.04	.44

Diabetes that can be controlled by diet is a relatively mild disease.		
11...Le diabete non-insulino-dependant est une maladie moins serieuse que le diabete insulino-dependant. Non insulin dependent diabetes is a less serious disease than insulin dependent diabetes.	1.99±1.16	.66
48...L'auto-surveillance des glycemies capillaires a peu d'importance dans le traitement du diabete non-insulino-dependant. Blood glucose monitoring has little value in the treatment of non insulin dependent diabetes.	1.68±.85	.29
10...Les complications du diabete non-insulino-dependantnne sont pas aussi serieuses que celles resultant d'un diabete insulino-dependant. The complications of non-insulin dependent diabetes are not as grave as those resulting from insulin dependent diabetes.	1.82±1.06	.61
Factor 6: Difficult to Treat		
16...C'est frustrant de traiter le diabete. It is frustrating to treat diabetes.	2.51±1.23	.34
29...Les personnes atteintes de diabete n'observent pas les recommandations de leur traitement comme elles devraient le faire. People with diabetes are not as compliant with their treatment recommendations as they should be.	2.95±.99	.39
35...En general, les patients obeses n'ont pas la volonte necessaire pour perdre du poids. In general, obese patients do not have the will power necessary to lose weight.	2.68±1.11	.42
36...Il est frustrant de traiter le diabete sachant que les complications vont survenir de toute facon. Diabetes is frustrating to treat knowing that complications will inevitably arise.	2.01±.93	.32

39...La plupart des personnes atteintes de diabete ne s'adaptent jamais a leur condition. Most persons with diabetes never adjust to their condition.	2.15±.84	.35
43...Il est difficile de soigner les personnes atteintes d'un diabete type II puisque la plupart d'entre eux sont passifs.	2.33±.99	.44
Factor 7: Outpatient Education		
49...Les personnes agees atteintes de diabete devraient etre hospitalisees au moment du diagnostique a fin de faciliter un enseignement efficace. Elderly diabetics should be hospitalized at the time of diagnosis to facilitate effective patient teaching.	3.23±1.15	.48
21...Les patients devant debuter l'insulinotherapie devraient etre hospitalises pour faciliter un enseignement efficace. Patients newly requiring insulin therapy should be hospitalized to facilitate effective patient teaching.	2.98±1.27	.44
34...L'education des patients atteints de diabete est plus efficace lorsqu'elle est donnee en externe.	3.43±.92	.26
Factor 8: Emotional Impact of Diabetes		
2...Avoir le diabete change la conception de la vie. Having diabetes changes a person's outlook on life.	4.03±.98	.34
8...L'impact emotionnel du diabete devrait etre une preoccupation tres importante pour les professionnels de la sante de premiere ligne qui traitent les personnes atteintes de diabete. The emotional impact of diabetes should be a major concern for primary health care professionals treating people with diabetes.	4.30±.76	.23
20...Le diabete affecte presque tout aspect de la vie d'une personne. Diabetes affects almost every part of a diabetic person's life.	3.90±.95	.37
24...L'impact affectif relie au diabete est tres minime. The emotional impact of diabetes is pretty small.	4.28±.84	.32