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University of Nevada, Reno

**Nurses' Perceptions of Diabetes: A Comparative Analysis**

A thesis submitted in partial fulfillment  
of the requirements for the degree of

**BACHELOR OF SCIENCE, NURSING**

by

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Glenn Hagerstrom, RN Ph.D., Thesis Advisor

December, 2012

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We recommend that the thesis  
prepared under our supervision by

**JARED NIGEL HOBSON**

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**BACHELOR OF SCIENCE, NURSING**

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## **Abstract**

Diabetes mellitus has arisen as a prevalent group of diseases requiring a multidisciplinary approach towards care and treatment. Associated with many complications and increased patient morbidity, proper diabetes management is vital to improve patient outcomes. Nurses play a major role in providing diabetes care and education to patients. This study examined nurses' perceptions of diabetes mellitus and their effects on patient care. The Diabetes Attitude Scale version 3 (DAS-3), developed by the University of Michigan Diabetes Research Center was administered on a trauma intensive care unit (ICU), a non-trauma ICU, a medical nursing unit, and a surgical nursing unit at a large hospital in the Northern Nevada area. Critical care and medical/surgical nurse responses were compared to explore the impact of unit type on nurses' perceptions of diabetes. Nurses' value of training arose as an important predictor of their perceptions of diabetes severity and the value of tight blood glucose control amongst critical care nurses but not medical/surgical nurses.

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## Chapter I: Introduction

According to the Center for Disease Control (CDC) (2011), diabetes is the seventh leading cause of death in the United States, affecting approximately 25.8 million people. A chronic progressive group of diseases characteristic of high blood glucose related to either poor insulin production, insulin action, or both, diabetes has been associated with many other co-morbidities. Recognized as a leading cause of heart disease and stroke, diabetes can affect a variety of systems causing hypertension, blindness, renal failure, nervous system disease, amputations, dental disease, complications in pregnancy, and other biochemical imbalances (CDC, 2011). At an estimated cost of \$176 million annually and with the World Health Organization (WHO) projecting that diabetes related deaths will double by 2030, diabetes has become a matter of increasing concern (WHO, 2011).

As a group of chronic diseases with many associated co-morbidities, management of diabetes surfaces as an important aspect of patient care to improve quality of life and prevent disease progression. Treatment of diabetes tends to focus on tight glucose control through medications, diet, and lifestyle changes (ADA, 2004). Diabetes self-management education (DSME) arises as an important aspect of achieving these changes, and has been associated with improved patient outcomes. DSME has been shown to be most effective when a multidisciplinary team is involved and develops a comprehensive care plan. Furthermore, it is vital that the individuals with diabetes be viewed as leaders of the team and serve as active participants (Funnell, et al., 2012). Nurses play a large role in DSME and are the most utilized in delivering formal patient education (Funnell et al., 2012). As such, the following questions will be explored to provide a greater understanding of nurses' perceptions on diabetes and the effects diabetes has on the patient involved:

1. Do nurses' perceptions of their need for training have a relationship to whether they view diabetes as severe?
2. Do nurses' perceptions of their need for training have a relationship to whether they value tight blood glucose control?
3. Do nurses' perceptions of the severity of diabetes have a relationship to their views on patient autonomy in determining their care and being adherent?
4. Do nurses' perceptions of the value of tight blood glucose control have a relationship to their views on patient autonomy in determining their care and being adherent?
5. Does the type of unit the nurses work on (either critical care or medical) impact their perceptions of diabetes, based on the previous questions?

A quantitative descriptive correlational study will be conducted to evaluate these questions.

A survey developed by the University of Michigan Diabetes Research and Training Center called the Diabetes Attitude Survey (version 3) or the DAS-3 will be distributed to various nursing units at a large hospital in the Northern Nevada area (see Appendix A). The results generated from this research should provide insight into nurses' perceptions of diabetes and the impact these have on the care nurses provide. It could further shed light on whether these differences are influenced by the type of unit (and thus the environment) in which these nurses work, and current evidence based practice in these settings.

## Chapter II: Literature Review

### Understanding Diabetes Pathophysiology

Diabetes mellitus is understood and defined by insulin production and its effect in the body. Insulin is produced by the beta-cells of the pancreas in the Islets of Langerhans and is released into the body in response to chemical, hormonal, and neural input (ADA, 2011c). Increased blood levels of glucose, amino acids, and gastrointestinal hormones as well as increased parasympathetic stimulation increase insulin secretion (Hartwig, 2009). At target cells, insulin binds with cell membrane receptors triggering increased glucose uptake (Huether & McCance, 2008). Diabetes mellitus results when defects in the body's ability to produce or respond to insulin occur (ADA, 2011a). There are two generally accepted types of diabetes: type 1 and type 2. Type 1 diabetes, or insulin dependent diabetes, results when the body cannot produce insulin, while type 2, non-insulin dependent diabetes, is characterized by insulin resistance at the receptor site and/ or insufficient production of insulin to meet the body's needs (ADA, 2011b).

While type 1 diabetes is autoimmune in origin, the exact cause of type 2 diabetes is currently unknown; however, environmental and lifestyle factors, as well as a strong genetic link have been identified as contributing factors (Huether & McCance, 2008). Individuals may be more at risk for type 2 diabetes if they lead a sedentary lifestyle, eat a high fat diet, or have a high body mass index (BMI) (Hartwig, 2009).

There are a variety of symptoms that can occur with diabetes. With type 1, common clinical manifestations include polydipsia, polyuria, polyphagia, and weight loss (Huether & McCance, 2008). These same manifestations can be present in type 2 diabetes; however often

these symptoms are slow and non-specific. Individuals may present with itching, fatigue, vision changes, reoccurring infections, and paresthesias (ADA, 2003). Furthermore, diabetes has been correlated with organ damage to the kidneys, eyes, and nerves (ADA, 2004). Individuals are also at a significantly higher risk for developing coronary artery disease, hypertension, and peripheral vascular disease (ADA, 2004).

### **Diabetes Management & Health Care Providers**

Individuals live with diabetes their entire lives as there is currently no known cure; making management of the disease an important factor to prevent complications and maintain quality of life. In managing diabetes, individual self-management accounts for 95% of patient care (Anderson, Fitzgerald, & Oh, 1993). Nurses play a role in providing this education, currently serving as the most utilized providers of diabetes self-management education (Funnell et al., 2012). When compared to physicians, nurses spend more time with their patients, provide more patient education, are better listeners, and know their patients better (Siminerio et al., 2007). It has also been recognized that nurses who have had more specialized training in diabetes care have better patient outcomes, at least short term (Funnell et al. 2012). On the flip side, when looking at U.S. nurses' perceptions of their role in diabetes care, nurses lack an understanding of psychosocial issues related to diabetes, and health care providers as a whole lack communication with their patients (Siminerio et al., 2007).

In a study conducted by Clark and Hampson in 2003 that utilized the Diabetes Attitude Survey comparing 104 health care providers and 100 patients with type 2 diabetes, it was found that health care providers viewed type 2 diabetes as more serious than their patients, and generally viewed diabetes as more difficult to manage than other chronic diseases. Health care providers further felt they did not have adequate time or resources to properly educate their

patients. A distinct need was identified, with patients needing to collaborate with their healthcare providers to manage their disease (Clark & Hampson, 2003).

### **The Influence of Unit Type: Critical Care vs. Medical**

To evaluate the influence of unit type on nursing practice and nurses' perceptions of diabetes, one must have an understanding of the difference between the various units. Specifically critical care and medical units will be focused on in this study. The terms critical care and medical refer to a more general type of unit rather than one specific unit, and are defined by the needs of the clients. Critical care or intensive care units (ICUs) are hospital units in which the clients receive intensive medical care and close monitoring, and are generally considered to be critically ill (Potter & Perry, 2009). Medical units are hospital units where clients are considered to have a medical problem that does not require intensive nursing care, therefore spanning a wide variety of diagnoses and specific unit types (Bakalis & Watson, 2005). This may include patients post-surgery who are placed on units known as Medical/Surgical units. Nurses working in these two general areas are defined as such: critical care nurses or medical/surgical nurses.

There have been many studies conducted that look at the importance of blood glucose control in diabetic patients, specifically in critical care settings, with few studies looking at medical units (Wexler, 2007). This focus and the importance of diabetes management and controlling blood glucose levels stems mainly from a study conducted by Van den Berghe et al. (2001) that correlated tight glycemic control with blood glucose levels at or below 110 mg/dL to improved mortality and morbidity rates on a surgical intensive care unit (ICU). Subsequent research by Van den Berghe et al. (2006) on a medical ICU found improved morbidity but not

mortality with all patients involved. These same results were found to hold true in a systematic review of 141 studies, showing that diabetes is not associated with increased mortality outside of surgical ICUs (Siegelaar, Hickmann, Hoekstra, Holleman, & DeVries, 2011). However, it was found that diabetes was a risk factor for developing complications such as organ failure and sepsis, but that mortality from these complications was no higher than non-diabetic patients with the same complications (Siegelaar, Hickmann, Hoekstra, Holleman, & DeVries, 2011).

While glucose control can be seen to decrease morbidity in critical care patients, with hyperglycemia being accepted as a risk factor for complications, there is debate as to at what levels blood glucose should be maintained. While Van den Berghe et al. (2001) found improved morbidity with blood glucose levels at or below 110 mg/dL, subsequent studies have found this to be controversial, favoring blood glucose values of 140-180 mg/dL (Ellahham, 2010). Schluskel et al. (2011) found diabetic patients to be intolerant of hypoglycemia, with diabetic non-survivors being associated with higher hypoglycemic episodes, therefore favoring more lenient blood glucose control. A meta-analysis of 26 trials also found tight glucose control to increase the risk of hypoglycemia in critical care patients, and did not improve mortality outside of the surgical ICU (Griesdale et al., 2009). However, while exact blood glucose levels remain controversial, Inzucchi (2006) notes that “the precise [blood glucose] target may be less important than recognizing that diabetes should not be ignored during hospitalization; that insulin therapy, when possible, should be proactive” (p. 1910).

The question then arises of the best way to manage blood glucose levels in the hospital setting. Lange (2010) notes that nurses play a vital role in diabetes management in the hospital and that patients tend to have better results with a long-acting basal insulin regimen and rapid-acting analogs used to correct for meals than a sliding-scale insulin regimen. The same results

were found by Umpierrez et al. (2007), with significant improvement in glycemic control with a basal-bolus insulin regimen over a sliding-scale insulin regimen. Umpierrez (2011) notes that these findings are widely available related to an intensive care setting, with little information available on non-ICU settings.

With a plethora of evidence-based literature available regarding diabetes management on critical care units but very little literature available on medical units, nurses' views and practices towards diabetes may be explored to illuminate possible differences. As Bakalis and Watson (2005) note, "the decisions nurses make are directly related to the clinical areas in which they work" (p. 39). Nurses on medical units focus on helping patients regain independence as a primary goal, and are often bound by time constraints. Critical care nurses on the other hand tend to focus directly on treating physical and psychosocial problems the patient may be experiencing (Bakalis & Watson, 2005). Therefore critical care nurses may be more inclined to focus on diabetes during their care of the patient's physical problems. With this literature base and the bias of diabetes literature towards critical care settings, nurses' perceptions of diabetes mellitus will be compared on medical and critical care units at a large hospital in the Northern Nevada area.

## Chapter III: Methodology

### Study Design & Instrumentation

This study followed a quantitative descriptive correlational design, utilizing the Diabetes Attitude Survey developed by the University of Michigan Diabetes Research and Training Center (1998). The study utilized the third and most recent version of the Diabetes Attitude Scale (DAS-3). With 33 items and 5 subscales, the survey measures five subscales following a Likert-type scale: the need for special training, the seriousness of non-insulin dependent diabetes mellitus, the value of tight glucose control, the psychosocial impact of diabetes mellitus, and patient autonomy (see Appendix A).

In developing the third version of the Diabetes Attitude Survey, and in association with the University of Michigan Diabetes Research and Training Center, Anderson, Fitzgerald, Funnell, and Gruppen (1998) break down the specific subscale meanings as follows: the subscale “the need for special training” assesses respondent’s attitudes towards whether health care professionals need training in teaching, counseling, and behavior change techniques. The subscale “seriousness of non-insulin dependent diabetes mellitus” evaluates respondent’s attitudes towards the seriousness of non-insulin dependent diabetes mellitus. The subscale “the value of tight glucose control” assesses respondent’s attitudes towards the benefit of glucose control and the cost to patients. The subscale “psychosocial impact of diabetes” assesses respondent’s attitudes towards the psychosocial impact of diabetes on those living with the disease. Lastly, the subscale “patient autonomy” assesses respondent’s attitudes towards whether or not patients should be the primary decision makers in determining their diabetes care.

The DAS-3 is found to be reliable and valid for measuring diabetes-related attitudes, using the Cronbach's alpha coefficient and the Pearson's coefficient, as well as the Delphi review, with an average Cronbach alpha coefficient of  $\alpha = 0.72$  (Anderson, Fitzgerald, Funnell, & Gruppen, 1998). This reliability held true for this specific study with a Cronbach's alpha coefficient of  $\alpha = 0.82$  ( $\alpha > 0.70$ ).

### **Study Implementation**

The DAS-3 was administered to nurses on specified critical care and medical units at a large hospital in the Northern Nevada area. The specific units involved included one surgical type unit, one medical unit, one trauma intensive care unit (ICU), and one non-trauma ICU. The desired and achieved sample size identified was sixty returned surveys. IRB approval was obtained from the hospital's IRB board with signed permissions from individual unit managers prior to implementation of the study. The DAS-3 was then administered on the units over the span of two weeks.

To administer the surveys, research personnel physically went to the units on both day and night shifts and distributed paper surveys to the nurses along with sealable envelopes to return the surveys. The nurses were given the full two week data collection time to complete and return the surveys. The surveys were collected from the nurses by the same research personnel. In addition, a collection box was placed on the units for nurses to return surveys. Upon collection, each survey was marked with an assigned symbol known only to the research personnel to distinguish which unit the survey came from. These surveys were then stored in a locked filing cabinet to which only the research personnel had access. The use of assigned symbols allowed surveys to be identified as either critical care or medical, as well as by the specific unit, but still

maintained respondent confidentiality. Confidentiality was further ensured as no identifying information was gathered or included on the questionnaire.

### **Performing Data Analysis**

To facilitate analysis of the data, the survey responses were assigned numerical values ranging from a five for “strongly agree” to a one for “strongly disagree”, as indicated by the DAS-3 Formulae. Reverse scoring was done for specified questions (see Appendix B). These data were then entered into an Excel spreadsheet and password protected. The statistical program SPSS (Statistical Package for the Social Sciences) version 21 was used to analyze the results, utilizing linear regression to analyze the relationships between the independent and dependent variables in the research questions.

While the DAS-3 measures five aforementioned scales, only four of these were used to analyze the research questions, the subscale measuring the psychosocial impact of diabetes mellitus being excluded. This decision was made to focus the research, as the other four subscales specifically relate to the health care provider’s role in providing diabetes care and the physical process of the disease, while the psychosocial impact of diabetes evaluates attitudes relating to the mental impact of diabetes on patients and the role that plays in providing diabetes care. The mental impact of the disease is another area of diabetes management that may be explored; however, this specific study focused on the physical aspects of managing diabetes and nurses’ related perceptions.

Once the results were analyzed utilizing the appropriate subscales, analysis was run again, differentiating results based on critical care or medical units. In order to address the research question, “does the type of unit the nurses work on (either critical care or medical)

impact their perceptions of diabetes, based on the previous questions?”. Table 1a below shows a breakdown of the data based on unit type:

Table 1a: Sample Breakdown by Unit Type

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Critical Care	35	58.3	58.3	58.3
	Medical Surgical	25	41.7	41.7	100.0
	Total	60	100.0	100.0	

With a total sample size of sixty nurses, the majority (58.3%) of the surveys were from critical care nurses, with twenty five surveys from medical/surgical nurses and thirty five from critical care nurses. Specifically, the breakdown of the surveys is given in Table 1b:

Table 1b: Sample Breakdown by Specific Units

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Non-trauma ICU	15	25.0	25.0	25.0
	Trauma ICU	20	33.3	33.3	58.3
	Surgical Unit	11	18.3	18.3	76.7
	Medical Unit	14	23.3	23.3	100.0
	Total	60	100.0	100.0	

The majority of surveys returned, and thus nurses that participated, were from the trauma ICU (n=20), followed by the non-trauma ICU (n=15) and medical unit (n=14), with the surgical unit yielding the lowest survey return (n=11). With a much greater amount of surveys returned from critical care nurses than medical/surgical nurses, the sample size of medical/surgical units may not be large enough to show statistical significance in the results.

## Chapter IV: Results

### Sample Description

The sample involved in this study included registered nurses (RNs) at a large hospital in the Northern Nevada area on one non-trauma ICU, trauma ICU, medical nursing unit, and surgical nursing unit. No distinction between the nurses was made based on age, gender, or education level, simply by what specific unit the nurses worked on (either the non-trauma ICU, trauma ICU, medical unit, or surgical unit) and the type of unit (either critical care or medical/surgical). Float nurses were excluded from participating in the study based on this criteria, as the units they normally work on are not one of the specified units. Group statistics for the research participants is seen in Table 2 below:

Table 2: Mean Scores for Surveyed Subscales

Unit Type		N	Mean	Std. Deviation	Std. Error Mean
Training	Critical Care	35	4.3143	.49536	.08373
	Medical Surgical	25	4.4240	.34312	.06862
Seriousness	Critical Care	35	4.2857	.33771	.05708
	Medical Surgical	25	4.1257	.46533	.09307
Control	Critical Care	35	4.1796	.34008	.05748
	Medical Surgical	25	4.0571	.57440	.11488
Autonomy	Critical Care	35	4.0036	.37191	.06286
	Medical Surgical	25	4.0250	.39857	.07971

An Independent Sample T-Test indicated no significant differences in mean scores between critical care and medical/surgical nurses' responses for all subscales, with mean scores ranging from 4.0036 to 4.4240.

### Significant Findings: Correlations.

While there was no significant difference in mean scores (see Table 2) between critical care and medical/surgical nurses' responses, significance was found when looking at the correlation between the various subscales as seen in Table 3:

Table 3: Subscale Correlations

		training	Seriousness	Control	Autonomy
Training	Pearson Correlation	1	.244	.319 *	.346 **
	Sig. (2-tailed)		.060	.013	.007
	N	60	60	60	60
Seriousness	Pearson Correlation	.244	1	.551 **	.191
	Sig. (2-tailed)	.060		.000	.145
	N	60	60	60	60
Control	Pearson Correlation	.319 *	.551 **	1	.140
	Sig. (2-tailed)	.013	.000		.285
	N	60	60	60	60
Autonomy	Pearson Correlation	.346 **	.191	.140	1
	Sig. (2-tailed)	.007	.145	.285	
	N	60	60	60	60

\*. Correlation is significant at the 0.05 level (2-tailed).

\*\*. Correlation is significant at the 0.01 level (2-tailed).

Bivariate Pearson Correlation was utilized to analyze the relationship between the various subscales and test for any significant positive or negative correlation. Significance is seen in Table 3 between the subscales: “the need for training” and “the value of tight glucose control” with a positive Pearson Correlation coefficient of 0.319 ( $p = 0.013$ ), “the need for training” and “patient autonomy” with a Pearson Correlation coefficient of 0.346 ( $p = 0.007$ ), and “the seriousness of non-insulin dependent diabetes” and “the value of tight glucose control” with a Pearson Correlation coefficient of 0.551 ( $p < 0.001$ ). These results display a significant positive relationship between the stated subscales, indicating that one subscale may affect another. However, based on this data, a cause and effect relationship cannot be assumed based on this analysis as an outlying factor may have impacted the significance. Therefore regression analysis

was used to further explore the relationship between the subscales and answer the stated research questions.

### Q1: Training Need and Diabetes Severity

Linear regression analysis was utilized with the subscales “the need for training” and “the seriousness of non-insulin dependent diabetes” to answer the first research question: Do nurses’ perceptions of their need for training affect whether they view diabetes as severe? For this specific question the subscale “the need for training” served as the independent variable, while the subscale “the seriousness of non-insulin dependent diabetes” served as the dependent variable. Analysis was performed to see if there was a significant relationship between the two variables:

Table 4a: Total Sample Linear Regression Analysis of Training Need on Diabetes Severity

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.244a	.060	.043	.39140

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.562	1	.562	3.671	.060
	Residual	8.885	58	.153		
	Total	9.448	59			

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.248	.509		6.379	.000
	training	.223	.116	.244	1.916	.060

No significant relationship was indicated between the two subscales based on this analysis with a  $p$  value of 0.060 ( $p > 0.05$ ) for all nurses involved in the research study. Therefore, the subscale “the need for training” was not related to the subscale “the seriousness of non-insulin dependent

diabetes”, indicating that for the complete sample size, nurses’ perceptions of their need for training do not affect whether those nurses view diabetes as severe.

#### Q5: Critical Care versus Medical/ Surgical Units.

While there was no significant relationship between nurses’ perceptions of their need for training and their views on diabetes severity amongst the whole sample, analysis was run to see if a relationship existed between nurses who work on critical care or medical/surgical units.

Table 4b shows linear regression analysis of the critical care nurses only:

Table 4b: Critical Care Linear Regression Analysis of Training Need on Diabetes Severity

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.342a	.117	.090	.32217		

  

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.452	1	.452	4.359	.045
	Residual	3.425	33	.104		
	Total	3.878	34			

  

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.281	.484		6.775	.000
	training	.223	.112	.342	2.088	.045

A significant relationship was found for the dependent variable “seriousness of non-insulin dependent diabetes” for the overall model  $R^2 = .117$ ,  $R^2_{adj} = .090$ ,  $F(1, 34) = 4.359$ ,  $p = .045$ .

The model accounted for 9% of the variance of the dependent variable, and the  $\beta$  value indicates that the independent variable “the need for training” significantly contributed to the model ( $\beta = .342$ ,  $p = .045$ ). These results differ from the entire sample results, which did not show significance. Therefore, critical care nurses’ perceptions of their need for training are related to

their views of diabetes as severe, differing from nurses' on medical/surgical units as shown below in Table 4c:

Table 4c: Medical/Surgical Linear Regression Analysis of Training Need on Diabetes Severity

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.219a	.048	.007	.46381		

  

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.249	1	.249	1.158	.293
	Residual	4.948	23	.215		
	Total	5.197	24			

  

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.812	1.224		2.297	.031
	training	.297	.276	.219	1.076	.293

While significance was found for critical care nurses with  $p$  values  $< 0.05$ , no significance was found for the medical/surgical nurses with a  $p > .05$  for the model overall and the independent variable “the need for training” ( $\beta = .219, p = .293$ ). The difference in these results shows that while critical care nurses' perceptions of their need for training may affect whether they view diabetes as severe, medical/surgical nurses' perceptions of their need for training does not. However, due to the critical care nurses only having slight significance ( $p = 0.045$ ), the sample as a whole did not show a significant relationship between nurses' perceptions of their need for training and their views on diabetes severity ( $p = 0.060$ )

## Q2: Training Need and the Value of Blood Glucose Control

The subscales “the need for training” and “the value of tight blood glucose control” were analyzed using linear regression to answer the second research question: Do nurses' perceptions of their need for training have a relationship to whether they value tight blood glucose control? The independent variable for this analysis was the subscale “the need for training” and the

dependent variable the subscale “the value of tight blood glucose control”. Table 5a shows the results for the entire sample (n=60):

Table 5a: Total Sample Linear Regression Analysis of Training Need on Blood Glucose Control

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.319a	.102	.087	.43228		

  

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.231	1	1.231	6.588	.013
	Residual	10.838	58	.187		
	Total	12.069	59			

  

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.692	.562		4.787	.000
	training	.329	.128	.319	2.567	.013

A significant relationship was found for the dependent variable “value of tight blood glucose control” for the overall model  $R^2 = .102$ ,  $R^2_{adj} = .087$ ,  $F(1, 59) = 6.588$ ,  $p = .013$ . The model accounted for 8.7% of the variance of the dependent variable, and the  $\beta$  value indicates that the independent variable “the need for training” significantly contributed to the model ( $\beta = .319$ ,  $p = .013$ ). Therefore, as a whole sample nurses’ perceptions of the need for training are significantly related to whether or not they value tight blood glucose control.

#### **Q5: Critical Care versus Medical/ Surgical Units.**

Analysis was performed to see if the significance found in the whole population holds true for critical care and medical/surgical nurses separately. Table 5b shows results from critical care nurses alone:

Table 5b: Critical Care Linear Regression Analysis of Training Need on Blood Glucose Control

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.398a	.159	.133	.31663		

  

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.624	1	.624	6.224	.018
	Residual	3.308	33	.100		
	Total	3.932	34			

  

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.000	.476		6.303	.000
	training	.273	.110	.398	2.495	.018

A significant relationship was found for the dependent variable “value of tight blood glucose control” for the overall model  $R^2 = .159$ ,  $R^2_{adj} = .133$ ,  $F(1, 34) = 6.224$ ,  $p = .018$ . The model accounted for 13.3% of the variance of the dependent variable, and the  $\beta$  value indicates that the independent variable “the need for training” significantly contributed to the model ( $\beta = .398$ ,  $p = .018$ ). Based on these findings, it is seen that critical care nurses perceptions of their need for training are related to whether they value tight glucose control. These results reflect the results of the entire sample, but not of the medical/surgical nurses, as shown in Table 5c below:

Table 5c: Medical/Surgical Linear Regression Analysis of Training Need on Blood Glucose Control

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.349a	.122	.084	.54983		

  

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.965	1	.965	3.193	.087
	Residual	6.953	23	.302		
	Total	7.918	24			

  

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.472	1.451		1.014	.321
	training	.584	.327	.349	1.787	.087

While the sample as a whole and the critical care nurses alone both showed significance for the subscales “the need for training” and “the value of tight blood glucose control”, medical/surgical nurses do not, with a  $p$  value greater than 0.05 ( $p = 0.087$ ). Therefore medical/surgical nurses’ perceptions of their need for training are not significantly related to whether they value tight blood glucose control, differing from the critical care nurses and the whole surveyed sample.

### **Q3 & Q4: Diabetes Severity, the Value of Blood Glucose Control, and Patient Autonomy**

The subscales “the seriousness of non-insulin dependent diabetes”, “the value of tight blood glucose control”, and “patient autonomy” were used to analyze the third and fourth research questions. The third research question states: do nurses’ perceptions of the severity of diabetes have a relationship to their views on patient autonomy in determining their care and being adherent? The subscale “the seriousness of non-insulin dependent diabetes” served as the independent variable for regression analysis, and the subscale “patient autonomy” served as the dependent variable. The same dependent variable was used to analyze the fourth research question: do nurses’ perceptions of the value of tight blood glucose control have a relationship to their views on patient autonomy in determining their care and being adherent? For this question, the subscale “the value of tight blood glucose control” served as the independent variable. Due to the two questions sharing a dependent variable, multiple regression analysis could be run for both questions simultaneously to see if either independent variable had an effect on the dependent variable. Table 6a displays these data:

Table 6a: Total Sample Multiple Regression Analysis of Diabetes Severity and Blood Glucose Control on Patient Autonomy

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.195a	.038	.004	.37922		

  

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.325	2	.162	1.130	.330
	Residual	8.197	57	.144		
	Total	8.522	59			

  

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.185	.559		5.702	.000
	Seriousness	.155	.148	.163	1.046	.300
	Control	.042	.131	.050	.324	.747

*P* values greater than the significance level of  $p < 0.05$  are shown for the overall model and two independent variables, indicating that both the independent variables “seriousness of non-insulin dependent diabetes” ( $\beta = .163$ ,  $p = .300$ ) and “the value of tight blood glucose control” ( $\beta = .050$ ,  $p = .747$ ) have no significant relationship to the dependent variable “patient autonomy”.

Therefore as a whole sample, nurses’ perceptions of the severity of diabetes are not significantly related to their views on patient autonomy in determining their care and being adherent.

Furthermore, collectively in this study nurses’ perceptions of the value of tight blood glucose control are not significantly related to their views on patient autonomy in determining their care and being adherent.

#### **Q5: Critical Care versus Medical/ Surgical Units.**

As separate groups, both the critical care nurses’ and medical/surgical nurses’ results reflected the findings of the whole sample. Analysis of the critical care nurses alone is seen in Table 6b:

Table 6b: Critical Care Multiple Regression Analysis of Diabetes Severity and Blood Glucose Control on Patient Autonomy

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.268a	.072	.014	.36929

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.339	2	.169	1.242	.302
	Residual	4.364	32	.136		
	Total	4.703	34			

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.421	1.009		2.400	.022
	Seriousness	.210	.193	.191	1.089	.284
	Control	.163	.192	.149	.852	.401

*P* values greater than the significance level of  $p < 0.05$  are shown for the overall model and two independent variables, indicating that both the independent variables “seriousness of non-insulin dependent diabetes” ( $\beta = .191$ ,  $p = .284$ ) and “the value of tight blood glucose control” ( $\beta = .149$ ,  $p = .401$ ) have no significant relationship to the dependent variable “patient autonomy” for critical care nurses alone. These data reflect that of the entire sample, with critical care nurses’ perceptions of either the seriousness of diabetes or the value of blood glucose control not being significantly related to their views on patient autonomy. Similar results can be seen for medical/surgical nurses in Table 6c:

Table 6c: Medical/Surgical Multiple Regression Analysis of Diabetes Severity and Blood Glucose Control on Patient Autonomy

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.181a	.033	-.055	.40944

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.124	2	.062	.371	.694
	Residual	3.688	22	.168		
	Total	3.813	24			

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.401	.749		4.540	.000
	Seriousness	.176	.262	.205	.669	.511
	Control	-.025	.213	-.036	-.117	.908

*P* values greater than the significance level of  $p < 0.05$  are shown for the overall model and two independent variables, indicating that both the independent variables “seriousness of non-insulin dependent diabetes” ( $\beta = .205, p = .511$ ) and “the value of tight blood glucose control” ( $\beta = -.036, p = .908$ ) have no significant relationship to the dependent variable “patient autonomy” for medical/surgical nurses alone. This indicates that medical/surgical nurses’ perceptions of the severity of diabetes and the value of tight blood glucose control are not significantly related to their views on patient autonomy. This finding corresponds with the data from the whole surveyed sample as well as the critical care nurses separately.

## **Chapter V: Discussion**

A chronic group of diseases resulting in extensive complications and increasing patient risk for hypoglycemia and increased morbidity, diabetes control and management arises as an important part of patient care management (Griesdale et al., 2009). While controversy exists over whether or not blood glucose levels should be maintained at or below 110 mg/dL or at a more lenient level between 140 – 180 mg/dL, proactive blood glucose control has been shown to improve patient outcomes, reduce complications, and decrease morbidity (Ellahham, 2010). Diabetes self management education (DSME) has been shown to have beneficial patient outcomes, particularly when a multidisciplinary team is involved and the patient is seen as a leader in the team (Funnell et al., 2012). With nurses providing direct care to patients and primary DSME, nurses play a large role in facilitating diabetes management and blood glucose control (Funnell et al., 2012). For this reason, nurses' perceptions on diabetes serve as an important focus for improving patient care, particularly in the following areas: the need for training, the seriousness of diabetes, the value of tight blood glucose control, and patient autonomy.

### **Q1 & Q2: The Affect of Training Need Perceptions on Diabetes Severity and Blood Glucose**

#### **Control**

Nurses' perceptions of their need for training arise as an important area to evaluate, as nurses who have received more specialized training in diabetes care have been shown to have better patient outcomes (Funnell et al., 2012). Therefore, the subscale "the need for training" may be analyzed to see if a relationship exists between other subscales, in this case the subscales "the seriousness of non-insulin dependent diabetes" and "the value of tight blood glucose control" were compared. Analysis may shed light on whether or not nurses who valued training

also saw diabetes as serious or valued tight blood glucose control. This is important to note based on the beneficial outcomes of blood glucose control and the fact that nurses who view diabetes as serious or severe may be more inclined to manage blood glucose levels.

In relation to the seriousness of diabetes, results from this study revealed that for the whole sample ( $n = 60$ ) and the medical/surgical nurses alone ( $n = 25$ ), nurses' perceptions of their need for training did not have a significant relationship to whether or not they viewed diabetes as severe, while critical care nurses' ( $n = 35$ ) perceptions of their need for training did have a relationship to their views on diabetes severity with a  $p$  value of 0.045 ( $p < 0.05$ ). Based on the collected data and the positive Pearson Correlation coefficients found in Table 3, critical care nurses who viewed training as important and who thought nurses should receive training also perceived diabetes as a serious or severe disease. Likewise, critical care nurses who did not think training was important did not see diabetes as serious. These findings suggest that an effect may exist between the subscales, and that if critical care nurses are educated to understand and see the value and importance of diabetes training, then they are likely to also see diabetes as a serious disease. Therefore, patient outcomes and diabetes management are more likely to be improved in a critical care setting if the nurses are educated on their need for training, as the nurses may strive for better diabetes management if they see diabetes as severe.

It is interesting to note however, that these findings do not hold true for the medical/surgical nurses alone or the total sample of nurses. These results for the whole sample may be attributed to the inclusion of the medical/surgical nurses in the sample having a  $p$  value far from the significance level of  $p < 0.05$  with a  $p$  value of 0.293, bringing the entire sample's  $p$  value to slightly outside of this level at 0.060. That being said, the real difference in the nurses' perceptions exists between the medical/surgical nurses and the critical care nurses. One possible

reason behind this difference may lie in the amount of literature available on diabetes management and blood glucose control in critical care settings as opposed to medical/surgical settings. Wexler (2007) notes that there are many studies available on blood glucose control on critical care units, but not on medical units. With a large focus on managing diabetes in critical care settings but not medical settings, nurses may be less inclined to perceive the importance of diabetes management in these settings, and therefore not see diabetes as severe. So while medical/surgical nurses may see training as important and valuable, due to a lack of current evidence-based literature on diabetes management, that perception may not correlate to their views on diabetes severity.

Another possible reason for these differing perceptions between critical care nurses and medical/surgical nurses may be related to their work environment. Bakalis and Watson (2005) note that the work environment in which nurses work directly affects their decision making. While critical care nurses tended to focus on the physical problems with the patient, nurses in a medical/surgical environment put a much greater focus on improving patient independence (Bakalis & Watson, 2005). This distinction between critical care and medical/surgical nurses suggests that critical care nurses may place a greater emphasis on diabetes management than medical/surgical nurses and therefore perceive diabetes as more severe. Medical/surgical nurses on the other hand may value training, but see training more as a way to help patients manage their diabetes once they have regained their independence and left the hospital environment.

Looking at results comparing the subscales “the need for training” and “the value of tight blood glucose control”, similar findings may be seen. In this case the sample as a whole and the critical care nurses alone displayed a significant relationship, with the whole sample having a  $p$  value of 0.013 ( $p < 0.05$ ) and the critical care nurses having a  $p$  value of 0.018 ( $p < 0.05$ ), while

medical/surgical nurses had a  $p$  value greater than the significance level at 0.087 ( $p > 0.05$ ). These findings mean that the sample as a whole and the critical care nurses' perceptions of their need for training did have a relationship to whether they valued tight blood glucose control. However, the medical/surgical nurses' perception of their need for training did not have a significant relationship to whether they value of tight blood glucose control. Based on the participants responses and a significant Pearson Correlation coefficient of 0.319 ( $p = 0.013$ ) between the subscales "the need for training" and "the value of tight blood glucose control" as seen in Table 3, a strong positive relationship can be seen. Therefore, nurses who strongly agreed that training is important also strongly valued tight blood glucose control, while nurses who did not see a need for training did not value tight blood glucose control.

The lack of significance for the medical/surgical nurses may again be attributed to the lack of evidence-based literature and the difference in work environment roles and focuses. However, with a  $p$  value of 0.087 being relatively close to the significance level of  $p < 0.05$  and a noteworthy difference in sample size between critical care ( $n = 35$ ) and medical/surgical nurses ( $n = 25$ ), the lack of significance may be related to having too small of a sample of medical/surgical nurses.

In general, it may still be noted that nurses' perceptions of their need for training have a significant relationship to both their views of diabetes severity and their value of tight blood glucose control in a critical care setting, suggesting an effect may exist. Therefore, nurses working in a critical care environment should receive and be educated on the value of diabetes management training, to improve patient outcomes and reduce morbidity rates as diabetes is recognized as a serious disease and tight blood glucose control is valued. Based on this study, the same cannot be said for medical/surgical nurses. For this reason the seriousness of diabetes

management and tight blood glucose control should be studied in medical/surgical environments to see if a significant effect on mortality and morbidity is noted. Furthermore, the impact of nurses' roles and focuses in the medical/surgical environment should be explored to find the best approach for improving diabetes management in that environment.

### **Q3 & Q4: The Affect of Diabetes Severity and Blood Glucose Control on Patient Autonomy**

Having looked at the impact of nurses' perceptions of their need for training on both diabetes severity and tight blood glucose control, these same dependent variables may now be explored to evaluate their relationship to patient autonomy. As Funnell et al. (2012) previously noted, the best patient outcomes result when diabetes management is approached by a multidisciplinary team in which the patient was one of the leaders. Clark and Hampson (2003) further support the need for a multidisciplinary team approach, stating that patients need to collaborate with their healthcare providers to properly manage their disease. As a part of this multidisciplinary team and primary providers of DSME, nurses' perceptions of patient autonomy may greatly impact patient diabetes management and outcomes. Should nurses not perceive diabetes as a severe or serious disease, or not value tight blood glucose control, they may be less inclined to value patients as active participants and determinants in their diabetes management. To evaluate these possibilities, the subscales "the seriousness of non-insulin dependent diabetes" and "the value of tight blood glucose control" served as the independent variable, and the subscale "patient autonomy" served as the dependent variable.

Results analyzing the relationship of both independent variables on patient autonomy revealed no significance. With p values of 0.330 for the whole sample, 0.302 for critical care nurses alone, and 0.694 for medical/surgical nurses alone, no significance is noted at the

significance level of  $p < 0.05$ . Therefore, for all participants, whether as a whole sample or separated into critical care and medical/surgical nurses, nurses' perceptions of the severity of diabetes do not have a significant relationship to their views on patient autonomy in determining their care and being adherent. Likewise for all participants, nurses' perceptions of the value of tight blood glucose control do not have a significant relationship to their views on patient autonomy. In other words, this suggests that while nurses on both unit types may view diabetes as severe and value tight blood glucose control, neither factor is a determinant of whether or not they feel patients should be autonomous in their care.

Differing perspectives on diabetes management may be indicated amongst nurses based on these findings. As neither independent variable had a significant relationship to patient autonomy, it may be seen that some nurses feel patients have the right to determine their care and adherence even if the nurses believe diabetes is severe and tight blood glucose control should be maintained. Other nurses however, may feel that because diabetes is severe and blood glucose control tight, the patient should not be autonomous in determining their care or whether they are adherent. The question then arises: do the ends justify the means? Nurses may feel that patients are poorly educated or don't fully understand their diabetes management, and for that reason care should be determined by other members of the multidisciplinary team to improve patient outcomes.

It may also be seen that for critical care nurses, their perceptions of their need for training are significantly related to their views on diabetes severity and tight blood glucose control, but their views on diabetes severity and blood glucose control are not significantly related to their views on patient autonomy. These findings are interesting to note, as a significant Pearson Correlation coefficient of 0.346 ( $p = 0.007$ ) was found in Table 3 between the subscales

“the need for training” and “patient autonomy”. While this significance does not show that perceptions of training affect views on patient autonomy, it does suggest a strong positive relationship between the two variables. With diabetes severity and blood glucose control having no relation to patient autonomy, the effect of training should be studied further. If indeed nurses’ perceptions of their need for training are related to or affect their views on patient autonomy, it stands to reason they would correlate to the nurses’ perceptions of diabetes severity and tight blood glucose control on critical care units. For instance, assuming a positive relationship between training and patient autonomy, a critical care nurse who valued training should theoretically also value diabetes severity, tight blood glucose control, and patient autonomy in determining care and adherence. However, since diabetes severity and blood glucose control are not determinants of patient autonomy, this relationship cannot be said to be the case. Therefore, further studies should be done to evaluate nurses’ perceptions of their need for training on patient autonomy and explore other influential variables or determinants.

#### **Q5: Comparing Critical Care and Medical/Surgical Units Collectively**

While critical care and medical/surgical nurse responses have been analyzed individually for each research question, the differences may be best seen when compared collectively. For both research questions one and two, critical care nurses’ perceptions of their need for training had a significant relationship to the dependent variables – in this case diabetes severity and the value of tight blood glucose control. However for questions three and four, neither critical care nurses’ perceptions of diabetes severity nor the value of tight blood glucose control had a significant relationship to on patient autonomy. For medical/surgical nurses on the other hand, no significance was found between the independent and dependent variables in any of the questions. These results support providing and educating critical care nurses on the value of diabetes

training to improve patient outcomes, since nurses who saw training as important also viewed diabetes as severe and valued tight blood glucose control – factors that have been shown to decrease mortality and complications in patients (Van den Berghe et al., 2001). Diabetes management and patient outcomes should be evaluated on medical/surgical units to compensate for the lack of evidence-based literature in these areas and explore methods of improving patient outcomes since medical/surgical nurses differed in their perceptions from the critical care nurses, not showing any significance between any of the studied independent and dependent variables.

### **Limitations & Recommendations**

One of the major limitations of this study is the small sample size of medical/surgical nurses compared to critical care nurses. With a 24 percent return rate with 250 surveys distributed and only 60 surveys returned, 58.3 percent of which came from critical care nurses ( $n = 35$ ) and 41.6 percent from medical/surgical nurses ( $n = 25$ ), results were based on a very small sample. Therefore, significance may not have been indicated amongst the medical/surgical nurses as the sample may not have been large enough to give an accurate portrayal of the medical/surgical nurses on the researched units. Furthermore, since this research was conducted solely at one hospital in the Northern Nevada area, results may not reflect nurses working in other institutions.

With more time available and a greater sample size, nurses' perceptions of diabetes and the impact of these perceptions may be explored in more depth. A greater variety of critical care and medical/surgical units could be studied to analyze how perceptions change based on very specific unit types – for instance a surgical ICU compared to a trauma ICU. Furthermore, should this study be repeated all five of the available subscales could be analyzed, including “the

psychosocial impact of diabetes” to explore the mental impact of diabetes on management.

Analysis could be performed using all the subscales as both independent and dependent variables to fully explore which perceptions affect each other. Lastly, multiple regression analysis could be utilized when analyzing all the different variables to explore whether an effect between the variables exists, as opposed to just a significant relationship.

## **Chapter VI: Conclusion & Implications for Nursing Practice**

As an integral member of the health care team, nurses play a large role in diabetes management and care. Diabetes has been associated with increased complications and morbidity in patients, particularly in the critical care setting. As leaders in diabetes self management education, nurses' perceptions of diabetes and the patient's ability to manage their disease may have significant effects on patient outcomes and autonomy. Exploring these perceptions, this study revealed that critical care nurses' perceptions of their need for training do affect whether they perceive diabetes as severe and value tight blood glucose control. The same could not be found for medical/surgical nurses, perhaps due to small sample size. However, in both groups it was found that nurses' perceptions of diabetes severity and the value of tight blood glucose control do not affect their perceptions of patient autonomy in determining their care and being adherent. This indicates the importance of providing and educating critical care nurses on the value of diabetes training as way of improving patient outcomes – leading to an increased value of tight blood glucose control and a greater awareness of diabetes as a serious disease. This study also suggests the need for great exploration of how best to manage diabetes in medical/surgical environment.

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### **Appendix A: Diabetes Attitude Survey version 3 (DAS-3)**

You have been asked to participate in a research project entitled "Nurses' Perceptions of Diabetes: A Comparative Analysis" as part of an Honors Thesis at the University of Nevada, Reno. The purpose of the study is to explore nurses' current knowledge and views on diabetes mellitus, specifically comparing results from medical units and critical care units.

You as a nurse are invited to participate in the study by completing the following survey. We realize that your time is valuable and have attempted to keep the requested information as brief and concise as possible. It will take you approximately 5 minutes of your time. Your participation in this project is voluntary. You may withdraw from the study at any time without consequence.

There are no known risks to you for participating in this study. Your responses are strictly confidential and no identifying information will be gathered. Any identifying information that is provided will be disposed of securely.

Please assist us in our research and return the completed survey in the enclosed envelope.

**Your consent is implied by the return of the completed questionnaire.** Please keep this letter for your information. If you have any questions, now or later, you may contact us at the number below. Thank you very much for your time and assistance.

Sincerely,

Jared Hobson (Primary Contact)

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## Diabetes Attitude Survey

Below are some statements about diabetes. Each numbered statement finishes the sentence “In general, I believe that...” You may believe that a statement is true for one person but not for another person or may be true one time but not be true another time. Mark the answer that you believe is true most of the time or is true for most people. Place a check mark in the box below the word or phrase that is closest to your opinion about each statement. It is important that you answer every statement.

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

	<b>Strongly Agree</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
<b>In general, I believe that:</b>					
1. ...health care professionals who treat people with diabetes should be trained to communicate well with their patients.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. ...people who do <u>not</u> need to take insulin to treat their diabetes have a pretty mild disease.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. ...there is not much use in trying to have good blood sugar control because the complications of diabetes will happen anyway.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. ...diabetes affects almost every part of a diabetic person’s life.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. ...the important decisions regarding daily diabetes care should be made by the person with diabetes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. ...health care professionals should be taught how daily diabetes care affects patients’ lives.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<b>In general, I believe that:</b>	<b>Strongly Agree</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
7. ...older people with Type 2* diabetes do not usually get complications.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. ...keeping the blood sugar close to normal can help to prevent the complications of diabetes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. ...health care professionals should help patients make informed choices about their care plans.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. ...it is important for the nurses and dietitians who teach people with diabetes to learn counseling skills.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. ...people whose diabetes is treated by just a diet do not have to worry about getting many long-term complications.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. ...almost everyone with diabetes should do whatever it takes to keep their blood sugar close to normal.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. ...the emotional effects of diabetes are pretty small.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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

**Strongly Agree    Agree    Neutral    Disagree    Strongly Disagree**

**In general, I believe that:**

- |  |                          |                          |                          |                          |                          |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 14. ...people with diabetes should have the final say in setting their blood glucose goals.                  | <input type="checkbox"/> |
| 15. ...blood sugar testing is not needed for people with Type 2* diabetes.                                   | <input type="checkbox"/> |
| 16. ...low blood sugar reactions make tight control too risky for most people.                               | <input type="checkbox"/> |
| 17. ...health care professionals should learn how to set goals with patients, not just tell them what to do. | <input type="checkbox"/> |
| 18. ...diabetes is hard because you never get a break from it.   | <input type="checkbox"/> |
| 19. ...the person with diabetes is the most important member of the diabetes care team.                      | <input type="checkbox"/> |
| 20. ...to do a good job, diabetes educators should learn a lot about being teachers                          | <input type="checkbox"/> |
| 21. ...Type 2* diabetes is a very serious disease.   | <input type="checkbox"/> |
| 22. ...having diabetes changes a person's outlook on life.   | <input type="checkbox"/> |

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

<b>In general, I believe that:</b>	<b>Strongly Agree</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
23. ...people who have Type 2* diabetes will probably not get much payoff from tight control of their blood sugars.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. ...people with diabetes should learn a lot about the disease so that they can be in charge of their own diabetes care.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. ...Type 2* is as serious as Type 1† diabetes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. ...tight control is too much work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27. ...what the patient does has more effect on the outcome of diabetes care than anything a health professional does.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. ...tight control of blood sugar makes sense only for people with Type 1† diabetes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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

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

<b>In general, I believe that:</b>	<b>Strongly Agree</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
29. ...it is frustrating for people with diabetes to take care of their disease.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. ...people with diabetes have a right to decide how hard they will work to control their blood sugar.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31. ...people who take diabetes pills should be as concerned about their blood sugar as people who take insulin.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32. ...people with diabetes have the right <u>not</u> to take good care of their diabetes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33. ...support from family and friends is important in dealing with diabetes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Revised 12/18/98

## Appendix B: DAS-3 Formulae

### Diabetes Attitude Scale - 3 Formulae

Scale Name	Scale Equation	Special Instructions
Need for Special Training	$\Sigma (Q1, Q6, Q10, Q17, Q20)$ / Number of non-missing items	
Seriousness of NIDDM	$\Sigma (Q2, Q7, Q11, Q15, Q21, Q25, Q31)$ / Number of non-missing items	Reverse scores for Q2, Q7, Q11, and Q15.
Value of Tight Control	$\Sigma (Q3, Q8, Q12, Q16, Q23, Q26, Q28)$ / Number of non-missing items	Reverse scores for Q3, Q16, Q23, Q26, and 28.
Psychosocial Impact of DM	$\Sigma (Q4, Q13, Q18, Q22, Q29, Q33)$ / Number of non-missing items	Reverse scores for Q13.
Patient Autonomy	$\Sigma (Q5, Q9, Q14, Q19, Q24, Q27, Q30, Q32)$ / Number of non-missing items	

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

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