The Association of Social Support and Self-efficacy to Blood Sugar Levels in Diabetes

by

Marissa Wai Gin Yee

A PROJECT

submitted to

Oregon State University

University Honors College

in partial fulfillment of
the requirements for the
degree of

Honors Baccalaureate of Science in Public Health (Honors Scholar)

Presented May 20, 2013
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AN ABSTRACT OF THE THESIS OF

Marissa Wai Gin Yee for the degree of Honors Baccalaureate of Science in Public Health presented on May 20, 2013. Title: The Association of Social Support and Self-efficacy to Blood Sugar Levels in Diabetes.

Abstract approved: _____
Viktor E. Bovbjerg

Background: The prevalence of diabetes has increased dramatically in recent decades. A lack of control over blood sugar levels can lead to diabetes-related complications. A network of family and friends providing diet-related support and diabetes-related care support may be associated with lower levels and changes in blood sugar (HbA1c) levels. Also, support received may be associated with self-efficacy because people with diabetes will feel empowered to make lifestyle changes. Self-efficacy may be associated with lower levels and changes in HbA1c levels.

Methods: The lifestyle intervention study included 428 men and women with type 2 diabetes who were randomly placed into the control or case study group. Questionnaires measured support desired and received by participants and their self-efficacy.

Results: Support received and desired, congruence of support, and self-efficacy were not significantly associated with changes in HbA1c levels. Self-efficacy and social support received were found to be significantly associated at multiple visits.

Conclusions: By understanding that social support received by persons with diabetes is associated with self-efficacy but not changes in HbA1c levels, research can be focused on finding other factors that may play a role in lowering HbA1c levels.

Key Words: diabetes, HbA1c levels, congruence, social support, self-efficacy

Corresponding e-mail address: marissa.yee.91@gmail.com

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APPROVED:

Mentor, representing School of Biological and Population Health Sciences

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Committee Member, representing School of Biological and Population Health Sciences

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Committee Member, representing School of Social and Behavioral Health Sciences

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Co-Director, School of Social and Behavior Health Sciences

Dean, University Honors College

I understand that my project will become part of the permanent collection of Oregon State University, University Honors College. My signature below authorizes release of my project to any reader upon request.

Marissa Wai Gin Yee, Author

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For my mother Loretta L. H. Yee,

for her ongoing support and encouragement

of my academic endeavors.

The Association of Social Support and Self-efficacy to Blood Sugar Levels in Diabetes

INTRODUCTION

There is a growing population of people being diagnosed with diabetes in the United States. In 2012, an estimated 22.3 million Americans were diagnosed with diabetes (Herman, 2013). As the population of people diagnosed with diabetes increases, the total cost of health care expenditures will increase. Those diagnosed in 2012 received 306 billion dollars' worth of medical care, or more than 20% of United States medical care costs (Herman, 2013). Of the 306 billion dollars, 176 billion dollars or approximately 12.5 percent of U.S. medical care costs were used for the treatment of diabetes (American Diabetes Association, 2013; Herman, 2013).

On average, Americans with diabetes spend $13,700 on medical care while those without diabetes spend $5,800 (Herman, 2013). The increased medical care costs for those with diabetes are connected to the growing population diagnosed with diabetes, the large number of people age 65 years and older who account for 59 percent of health care expenditures, and the monetary cost of diabetes-related complications (Herman, 2013). The largest portion (43 percent) of medical care costs is spent on inpatient services with two of the smallest portions of medical care costs going towards diabetes medicine and supplies (12 percent) and physician office services (9 percent) (ADA, 2013). The amount of money spent on diabetes-related complications needs to decrease, but will only happen if the number of diabetes-related complications decreases. The number of complications may be prevented with the involvement and influence of a social support system

motivating people with diabetes to make lifestyle changes to better control blood sugar (HbA1c) levels.

Psychological Family Intervention for Poorly Controlled Type 2 Diabetes

A preventive care approach aimed at diabetes-related complications can be motivating people with diabetes to have a less negative outlook on living with diabetes. People who possess a negative outlook on life with diabetes have a more challenging time controlling their diabetes than those with a positive outlook on life with diabetes (Keogh, Smith, White, McGilloway, Kelly, Gibney, O'Dowd, 2011). A research study conducted in Ireland evaluated "the effectiveness of a psychological, family-based intervention to improve diabetes-related outcomes in patients with poorly controlled type 2 diabetes" (Keogh et al., 2011, 105). The study was a 6-month randomized controlled trial with 121 participants who received care from "specialist diabetes clinics at a large suburban hospital" (Keogh et al., 2011, 105). Participants were randomly placed into either a control or intervention group. Participants in the intervention group were given two weekly 45 minute in-person sessions at their home with a supportive family member and a 10- to 15-minute follow-up phone call from a health psychologist. The three sessions were customized to each participant's needs and "focused on (1) challenging and clarifying any inaccurate and/or negative perceptions about diabetes, (2) examining how these perceptions influenced self-management, and (3) developing written personalized action plans to improve self-management and mobilize family support" (Keogh et al., 2011, 107). The health psychologist used motivational interviewing and health psychology techniques during the sessions to help participants set goals and action for

change, reduce negative perceptions of diabetes, and build self-efficacy. Intervention and control group participants continued receiving their normal diabetes care.

People with diabetes who received a psychological family-based intervention experience "improvements in glycemic control, diabetes perceptions, psychological well-being, self-management behaviors, and family support" (Keogh et al., 2011, 111). Although participants did not reach the desired glycemic control targets, a 0.4% decrease in HbA1c levels was noticed in the treatment condition. The decrease in HbA1c levels was small especially for people living with high HbA1c levels. Although a clinically significant change in HbA1c levels was not noticed, family support was found to have an effect on participants' ability to have more control over their diabetes.

Social Support among a Hispanic Population

A research study examined "the role played by social support in the self-management of insulin-requiring diabetes among a Hispanic population" (Gleeson-Kreig, Bernal, & Woolley, 2002, 216). Self-efficacy is "the belief a person has about his or her ability to act in a given situation" (Gleeson-Kreig et al., 2002, 218). The insulin management diabetes self-efficacy scale (IMDES) comprised of 26 statements was used to measure participants' self-efficacy in areas of general self-efficacy, diet self-efficacy, and insulin self-efficacy, and total self-efficacy. Participants were asked questions about their support system, such as who would they turn to for help buying and taking medication, making meals, and going to the doctor's office or clinic (Glesson-Kreig et al., 2002). They were also asked to rate their satisfaction of the help received.

Social support measured in the study was "not strongly related to diabetes self-management" (Gleeson-Kreig et al., 2002, 220). Also, the various types of people providing support and participants' satisfaction of support received was not related to HbA1c or to the total and subscales of self-efficacy measured. The researchers' proposed two explanations for social support and diabetes management not being related. The first was the "lack of true connections" between participants and their support system on the subject of diabetes management (Gleeson-Kreig et al., 2002, 221). The second was issues with how support was measured. The instrument used did not provide detailed data about the participants' support system. The limitations and issues researchers faced led them to suggest future study is needed to study "the interaction of social support and diabetes management" among the Hispanic population and other populations (Gleeson-Kreig et al., 2002, 221).

Information gained from studies focused on examining the role of social support and self-efficacy while making lifestyle changes will impact how health care professionals can best assist patients in making lifestyle changes. People with type 2 diabetes who are unable to control their HbA1c levels are at risk from multiple diabetes-related complications, such as blindness, high blood pressure, hearing loss, loss of mobility, heart disease, stroke, neuropathy, and kidney disease (American Diabetes Association, n.d.).

Hypotheses

Approaches to prevent diabetes-related complications for people with diabetes may include the involvement of a support system comprised of family and/or friends. Family and friends supporting the lifestyle changes of a person with diabetes may affect the person's self-efficacy in making positive changes and ultimately lowering and controlling HbA1c levels.

For persons with type 2 diabetes, being able to manage their diabetes is important and essential. Diabetes self-management may be improved through the level of social support received and level of self-efficacy. The first study presented above suggests social support helps improve diabetes control among persons with diabetes, though not to a clinically substantial extent. The results of the study may not have shown a clinically significant relationship between social support and improvement of diabetes control due the study design. Participants were provided lifestyle change plans tailored to their needs. The researchers did not measure the social support *desired* and received by the study participants. So far, there has not been a study that looks into an association between level of social support desired and received and the congruence of social support to changes in HbA1c levels. Therefore, the main focus of this thesis was to determine if there is a statistically significant association between the degree to which HbA1c levels changed and the levels of help and support actually received by patients as compared to their desired levels of help and support. The second study suggested future research look into the role of different types of social support and their effect on diabetes management. Self-efficacy in the same study was used to assess diabetes self-management rather than to determine if self-efficacy is associated with changes in HbA1c levels. Therefore, this

thesis also investigates the question “Is social support associated with participant’s self-efficacy?”

RESEARCH DESIGN AND METHODS

This research project used data from a lifestyle intervention study Improving Control with Activity and Nutrition (ICAN). ICAN was a partnership between the University of Virginia and Southern Health Systems (SHS) to demonstrate that clinically proven lifestyle changes can be implemented and maintained in settings more typical of those in which a majority of Americans receive care. Participants were enrollees in Southern Health Systems' health plans, and were from four regions in Virginia around Roanoke, Harrisonburg/Shenandoah Valley, Charlottesville, and Richmond. These four regions in Virginia have a combination of urban, suburban, and rural settings. The enrollees were covered by employers, Medicare, and Medicaid. At the time of the study approximately 163,000 health plan members lived in the four regions: 20,000 in Roanoke, 15,000 in Harrisonburg/Shenandoah Valley, 65,000 in Charlottesville, and 63,000 (50,000 commercial and 13,000 Medicaid) in Richmond.

Study Participants

The eligibility requirements for the larger ICAN study were being a health plan enrollee who was treated for type 2 diabetes within one year before entry into the trial, having a BMI at or above 30, and being 18-years-old or older. See Figure 1 below for characteristics of the ICAN study participants.

Table 1. Characteristics of ICAN Participants

	% of Total
Women	64
Caucasian	78
Current smoker	6
Married	74
≥ AA degree	43
	mean ± SD
Age	54.2 ± 9.8
Years since dx	6.8 ± 6.3
Weight (kg)	110.3±23.1
BMI	39.3 ± 7.9
Waist (cm)	119.5±16.5
HbA1c	7.5 ± 1.5
Cholesterol	179 ± 41
Total (mg/dL)	100 ± 34
LDL	45 ± 12
HDL	184 ± 146
Triglycerides	

An eligible participant was excluded from the study after the baseline visit if he/she had (1) end-stage renal disease (defined as being on dialysis), (2) active foot ulcers or infections (an open wound or requiring drug therapy), or (3) pulmonary, cardiac, renal, hepatic, neurologic, psychiatric, infectious, neoplastic, and malignant disease (other than non-melanoma skin cancer) that precludes diet and physical activity changes. Those with chronic renal failure were not excluded. For those unable to read at a sixth grade level, a family member or other supporter willing to assist with data collection efforts was

required. Physical limitations did not affect eligibility, but were assessed to insure appropriate levels of physical activity would be recommended. Participation was not limited by gender or race/ethnic background.

For the study reported here, additional requirements for participants were having data on HbA1c, support desired, support received, and self-efficacy. HbA1c data was collected during laboratory visits at the start of the study (baseline) and prior to each 6 month visit. Data for support desired and support received was determined valid if each participant answered all parts in Questions 41 and 42 related to support desired and received (see Figures 1 and 2). Participants who skipped a question or part of a question or had answered "Does Not Apply" were not included in the data analyses for that visit. Data that was classified as missing was treated as missing. Self-efficacy data was determined valid the same way as support desired and received data.

Figure 1. Question 41 of "Participant" Questionnaire

41. I *want* a lot of help and support from my family or friends in:
(circle one answer for each line)

	Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree	Does Not Apply
a) following my meal plan.	1	2	3	4	5	N/A
b) taking my medicine.	1	2	3	4	5	N/A
c) taking care of my feet.	1	2	3	4	5	N/A
d) getting enough physical activity.	1	2	3	4	5	N/A
e) testing my sugar.	1	2	3	4	5	N/A
f) handling my feelings about diabetes.	1	2	3	4	5	N/A

Figure 2. Question 42 of "Participant" Questionnaire

42. My family or friends *do* help and support me a lot to:
(circle one answer for each line)

	Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree	Does Not Apply
a) follow my meal plan.	1	2	3	4	5	N/A
b) take my medicine.	1	2	3	4	5	N/A
c) take care of my feet.	1	2	3	4	5	N/A
d) get enough physical activity.	1	2	3	4	5	N/A
e) test my sugar.	1	2	3	4	5	N/A
f) handle my feelings about diabetes.	1	2	3	4	5	N/A

Following baseline data collection, eligible participants agreeing to participate were randomly assigned to (1) the lifestyle case management group or (2) the lifestyle intervention group. After being assigned to a group, *all* participants met with a registered dietician (RD) case manager individually, in groups, and by phone for assessment, to set goals, and to gain education and support. All participants took part in six individual sessions totaling 4 hours throughout the first year and participants attended six 1-hour small group sessions.

After the first year, participants were divided into ongoing maintenance or usual care groups. Ongoing maintenance participants continued to see the study dietitians, but less frequently. Usual care participants were given educational material and allowed to join other weight management or diabetes care programs, but did not have access to study dietitians or fitness experts. The protocol – modified from the Diabetes Prevention Protocol (DPP) – was tailored for each individual participant with goals of diet change, weight, exercise, and behavioral change goals. Case managers met, discussed, and created a reasonable and incremental plan. In 2001, 2,950 people with diabetes out of 156,000 people were covered by SHS. 428 SHS members were eligible and enrolled in ICAN.

Data Collection

Participants completed numerous questionnaires and forms during the study. Baseline data was collected with the "ICAN Baseline" questionnaire. Every 6 months after until the end of the study, participants answered the "Participant" questionnaire.

Methods

Data collected from two questionnaires titled "ICAN Baseline" and "Participant" was used in conducting secondary analyses to investigate the hypotheses. Data elements chosen for analysis were selected if it related to social supports received or desired, participant's self-efficacy, participant's support system, or participant's feelings. One of the data elements used for both hypotheses was collected from Questions 41 and 42 of the "Participant" questionnaire. Question 41 asked each participant to select how much he/she disagreed, agreed or was neutral to a statement of social support *desired* for (a) following his/her meal plan, (b) taking medicine, (c) taking care of feet, (d) getting enough physical activity, (e) testing blood sugar, (f) handling feelings about diabetes. Question 42 was similar to Question 41 in the respect of asking participants to select how much he/she disagreed, agreed, or was neutral to a statement of the same 6 social supports (a-e), but was about support *received*. Participants circled a number (1-5) or N/A (for Does Not Apply) in response to each statement. The response options were: strongly disagree (select 1), disagree (2), neutral (3), somewhat agree (4), strongly agree (5), does not apply (N/A).

Before statistically analyzing data related to social support received and desired, all data was recoded to start from 0 instead of 1. The recoding was beneficial when summing social support received and desired to create composite scores and for congruence. If data for a participant was missing, other information the participant had provided was still included. For the congruence values to be used in the one-way ANOVAs, three groups were created although congruence values ranged from -4 to 4. One group included participants who had received less support than desired were grouped

together even though there were varying levels of lack of support. Another group included participants who received more support than desired were also grouped together. The third group consisted of participants who received as much support as desired (i.e. were congruent). The creation of three groups (those who had received less than desired, those who had received as much as desired, and those who had received more than desired) were created after looking at the frequencies of visits 4, 5, and 6. During the later visits, fewer participants were still in the study and data at the extreme end of the response ranges were sparse. Previous to the regrouping, the groups of participants receiving more or less support than desired were very small. Comparing what would have been nine groups with little to no data in the extreme groups would have led imprecise point estimates. With three groups, there would be enough participants to give a better analysis of the effect of more, less, or congruent support received and desired on HbA1c levels.

In order to compare social support desired and received and congruence of support to changes HbA1c levels, participants had to have blood drawn at the beginning of the study (baseline) and every 6 months after. Changes in HbA1c levels were calculated by taking a participant's HbA1c level at a visit and subtracting the previous visit's HbA1c level. For example, HbA1c change 01 is equal to HbA1c level at visit 1 minus HbA1c level at baseline, and HbA1c change 02 is equal to HbA1c level at visit 2 minus HbA1c level at visit 1.

All data analyses were done using IBM SPSS software.

Hypothesis 1

To determine if support received and desired and congruence of support was associated with changes in HbA1c levels, one-way ANOVAs were run comparing HbA1c and related HbA1c change by support received and desired and a congruence of support. For example, a one-way ANOVA of HbA1c at visits 1 and 2 and HbA1c change at 6 and 12 months by support received and desired and congruence of support desired and received was run.

Analyses were run to determine if diet-related support received by each participant was correlated with HbA1c levels and changes in HbA1c levels. Diet-related support was measured by Question 36 items A-D from the "Participant" questionnaire (see Figure 3). Responses to these 4 items were combined to create a composite response and the value of 4 was subtracted to have a range of values from 0 to 16 The range of values prior to the subtraction of 4 was 4 to 20 because responses were recorded ranging from 1 to 5. A value of 4 was subtracted in order to have the scale start at 0 rather than at 4. The composite response became a variable labeled dietsupport1, dietsupport2, dietsupport3, etc., with the number representing the visit responses were from. Regarding participants who had skipped questions or there was missing data, these participants' responses were not included in order to not have negative values as responses. A frequency of the diet-related support variables was run before running the correlation described above.

Figure 3. Question 36 from "Participant" Questionnaire measuring diet-related support received and support received making a participant feel good.

36. How often does your support system (e.g., family, friends):

	never/ almost never	infrequently	about half the time	often	always/ almost always
A. compliment you when you eat healthfully	❑	❑	❑	❑	❑
B. limit their own diet to be in line with the changes you are making	❑	❑	❑	❑	❑
C. help shop for or prepare foods that will help you make the diet changes you want to	❑	❑	❑	❑	❑
D. help you stick with your diet changes when you are in social situations	❑	❑	❑	❑	❑
E. compliment you when you keep to your exercise goals	❑	❑	❑	❑	❑
F. exercise with you	❑	❑	❑	❑	❑
G. help you stick with your exercise changes when you are finding it tough	❑	❑	❑	❑	❑
H. generally make you feel good about lifestyle changes you are making	❑	❑	❑	❑	❑

Hypothesis 1a

To determine if social support is associated with participant's self-efficacy, a self-efficacy scale and variables were created by summing responses to Question 9 of the "Participant" questionnaire. Question 9 had 3 parts, and asked participants "How confident are you that you can maintain your *diet* changes in the following situations?" The situations included: A. at a party, B. at a restaurant with family or friends, and C. when upset, tired, tense.

Question 36 was also used to investigate whether diet-related support and support received making a participant feel good about making lifestyle changes had an effect on HbA1c levels and self-efficacy. To determine if diet-related support received was

correlated with self-efficacy, analyses comparing means among the diet support variables compared with self-efficacy, changes in HbA1c and absolute HbA1c were run. Items E through G were not included in the analysis because they are exercise-related and a mismatch with self-efficacy questions exists. Item H [How often your support system (e.g., family, friends) generally make you feel good about lifestyle changes you are making?] was recoded to start from 0 instead of 1, with previous 0s becoming -9s, and then was analyzed on its own using a one-way ANOVA test. For analysis purposes, the variable of participants' responses to Item H was named feelGoodLifestyleChanges1, feelGoodLifestyleChanges2, feelGoodLifestyleChanges3, etc. One-way ANOVAs were also run comparing each of the Item H variables with its respective HbA1c and HbA1c change values at 2 consecutive visits and self-efficacy for the visit. This test is similar to the one conducted using diet-related support variables. The first one-way ANOVA was of item H with HbA1c at 6 and 12 months, HbA1c change at 6 and 12 months, and self-efficacy at visit 1. 6 one-way ANOVAs were run.

To determine if social support is associated with participants' self-efficacy, a total of 31 one-way ANOVAs of self-efficacy at each visit (except visit 6 where only association with meal planning was tested) by each type of support received selected at the same visit were run. The one-way ANOVAs used the self-efficacy scales described in the previous paragraph and the support received variables regarding meal planning, medicine, feet, physical activity, blood sugar testing, and feelings. Next, 30 one-way ANOVAs were run of self-efficacy at each visit by the types of support desired at the same visit. For the one-way ANOVAs of self-efficacy by the various supports received and supports desired, the data pertaining to group 6 includes responses of "does not

apply". Since group 6 consists of participants who marked "does not apply", this group was not used in comparing groups 1-5.

RESULTS

Hypothesis 1

From the one-way ANOVAs of HbA1c levels at visits 1 and 2 and HbA1c change at related visits by support received, desired, and congruence, no significant associations were discovered between support received and desired and congruence with changes in HbA1c levels.

A total of 42 correlations were conducted for the variables of diet-related support received and changes in HbA1c levels every six months. Of the 42 correlations, only 12 were focused on because we wanted to see if diet-related support was correlated with HbA1c change around the same time participants answered the diet-related support questions. There were no significant correlations between received diet-related support and changes in HbA1c levels.

Hypothesis 1a

A total of 36 correlations were run testing responses to diet-related support questions and self-efficacy questions. Of the 36 correlations, 6 were focused on. These 6 correlations were of the diet-related support responses correlated with self-efficacy responses at the same visit. For correlations of visits 1, 2, 3 and 5, there are significant but not strong positive correlations. There were no significant correlations for visits 4 and 6.

A total of 30 one-way ANOVA tests were conducted to compare the frequency of support received in the form of making a participant feel good about lifestyle changes

with absolute HbA1c levels, HbA1c change, and self-efficacy. When feel-good-about-lifestyle-changes-related support and self-efficacy for visit 1 were tested, mean self-efficacy scores increased as the frequency of support making a participant feel good about his/her lifestyle changes increased ($n = 416$, $F = 3.854$, $p = 0.004$). A similar pattern occurred when analyzing visit 2 responses ($n = 218$, $F = 7.697$, $p =< 0.001$). When the variables for visit 3 were tested there was a significant association ($n = 190$, $F = 4.974$, $p = 0.001$). There was a significant association between responses for visit 4 ($n = 168$, $F = 2.521$, $p = 0.043$). For visit 5, there was a significant association ($n = 134$, $F = 4.392$, $p = 0.002$). During visit 6, the association was not significant ($n = 35$, $F = 1.746$, $p = 0.166$). There was no significant association between HbA1c change and the frequency of a participant receiving support over the 6 visits.

One-way ANOVAS were run to see if there was an association between participants' self-efficacy and the level of support received for various types of support. When one-way ANOVAs were run of self-efficacy by support received for meal planning at each visit, there was a significant association at visits 1, 2, 3, and 5 ($F = 4.932$, $p < 0.001$; $F = 5.239$, $p < 0.001$; $F = 3.925$, $p = 0.002$; $F = 4.853$, $p < 0.001$). One-way ANOVAs of self-efficacy by support received for taking medicine showed a significant association at visit 1, 2, and 3 ($F = 4.629$, $p < 0.001$; $F = 3.051$, $p = 0.011$; $F = 2.697$, $p = 0.022$). For one-way ANOVAs of self-efficacy by support received for feet-related care, there were a significant associations at visits 1, 2, 3, and 5 ($F = 4.185$, $p = 0.001$, $F = 6.349$, $p < 0.001$; $F = 2.535$, $p = 0.030$; $F = 5.557$, $p < 0.001$). One-way ANOVAs of self-efficacy by support received for physical activity showed significant associations at visits 1, 2, and 3 ($F = 4.744$, $p < 0.001$; $F = 3.664$, $p < 0.001$; $F = 3.719$, $p < 0.003$). One-

way ANOVAs of self-efficacy by support received for testing blood sugar yielding significant associations at visits 1, 2, 3, and 5 ($F = 3.695$, $p = 0.003$; $F = 5.915$, $p < 0.001$; $F = 3.009$, $p = 0.012$; $F = 2.394$, $p = 0.041$). One-way ANOVAs of self-efficacy by support received for handling diabetes-related feelings revealed significant associations at visits 1, 2, 3, 4, and 5 ($F = 6.835$, $p < 0.001$; $F = 5.746$, $p < 0.001$; $F = 3.592$, $p = 0.004$; $F = 4.083$, $p = 0.002$; $F = 3.862$, $p = 0.003$).

One-way ANOVAS were run to see if there was an association between participants' self-efficacy and the level of support desired for various types of support. One-way ANOVAs of self-efficacy by support desired for meal planning revealed a significant association at visit 5 ($F = 3.098$, $p = 0.011$). One-way ANOVAs of self-efficacy by support desired for medicine yielded significant associations at visits 2 and 4 ($F = 2.692$, $p = 0.022$; $F = 3.085$, $p = 0.011$). For one-way ANOVAs of self-efficacy by support desired for feet-related care, there were significant associations at visits 2 and 4 ($F = 2.692$, $p = 0.022$; $F = 3.085$, $p = 0.011$). One-way ANOVAs of self-efficacy by support desired for physical activity yielded significant associations at visits 1 and 5 ($F = 3.322$, $p = 0.006$; $F = 3.842$, $p = 0.003$). For one-way ANOVAs of self-efficacy by support desired for blood sugar testing, there were no significant associations at any visits. One-way ANOVAs of self-efficacy by support desired for handling diabetes-related feelings yielded significant associations at visits 2 and 5 ($F = 2.501$, $p = 0.032$; $F = 3.636$, $p = 0.004$).

There was no significant correlation between self-efficacy and HbAlc change. When self-efficacy for visit 1 was correlated with HbA1c change at 6 months there was

no significant correlation ($r = 0.076$, $p =< 0.240$). The correlations for visits 2 through 6 followed a similar pattern.

DISCUSSION

The main objective was to determine if a statistically and clinically significant association existed between the degree to which HbA1c levels changed and the levels of help and support actually received by participants as compared to their desired levels of help and support. From the one-way ANOVAs comparing each type of support (meal planning, taking medicine, feet care, physical activity, testing HbA1c, and handling feelings about diabetes) received and desired and congruence of support received and desired to HbA1c levels and HbA1c change for two consecutive visits, no significant association between change in HbA1c levels and support received compared to support desired was determined. Related to social support desired and received is the frequency of diet-related support received from a support system of family and friends. Some analyses looked into whether or not there was a correlation between the frequency of diet-related support and the change in HbA1c levels at the respective visit. The frequency of diet-related support received from a support system was not found to be related to changes in HbA1c levels.

Our findings regarding the association of social support and changes in HbA1c levels do not support the previous research finding that determined family support as having an effect on those living with diabetes to have more control over their diabetes. However, our findings do support the findings of research that looked at social support among a population of Hispanics living with diabetes which determined social support received was not related to HbA1c. In regards to the first research finding, this may have been the result of not having participants answer questions pertaining to only family

support. The specific support systems of participants were not evaluated to see if different sources of support (family versus friends) was a factor in the association of social support and support received, desired, and congruence of support. Future research could be focused on determining whether the source of social support may play a role in controlling HbA1c levels, as well as changes in HbA1c levels.

A secondary objective was to determine if social support is associated with participant's self-efficacy. When diet-related support and self-efficacy were compared, a weak, but positive, correlation was found between the frequency of support received and participant's belief of being able to make lifestyle changes for visits 1, 2, 3, and 5. During these visits as the frequency of diet-related support increased, the average self-efficacy scores increased.

One-way ANOVAs revealed participants' self-efficacy increased as the frequency of support which made participants feel good about making lifestyle changes increased at 4 of the 6 visits. Although self-efficacy and receiving support making a participant feel good were significantly associated, there was no significant association between changes in HbA1c and the frequency of "feel good" support at any of the visits.

One-way ANOVAs were run to determine if there was an association between participants' self-efficacy and each level of support (meal planning, taking medicine, feet care, physical activity, testing HbA1c levels, and handling feelings about diabetes) received. At most visits, participants' self-efficacy and support received for meal planning was found to be significantly associated. At the first 3 visits, self-efficacy and support received for taking medication were found to be significantly associated. Self-efficacy and support received for feet-related care was significantly associated at most of

the visits. For the first 3 visits, self-efficacy was found to be significantly associated with support received for physical activity. Self-efficacy and support received to test blood sugar levels was significantly associated at the first 3 visits and the 5th visit. For visits 1 to 5, self-efficacy and support received for handling diabetes-related feelings were significantly associated.

In addition to investigating the association between self-efficacy and social support received, the association between self-efficacy and social support desired were investigated. Self-efficacy and social support desired for meal planning, taking medicine, feet-related care, physical activity, blood sugar testing, and handling diabetes-related feelings were not associated at a majority of visits.

When participants' self-efficacy and changes in HbA1c were compared, there were no significant correlations. Changes in HbA1c were determined to not have a strong connection with the level of confidence a participant had in maintaining his/her diet changes while at a party or social gathering, a restaurant with family or friends, and when upset, tired, or tense.

From the article *Social Support among a Hispanic Population* (Gleeson-Kreig et al., 2002), social support received was not seen as being connected with self-efficacy and future research into the role of social support and diabetes management was suggested. Our research which investigating the association and correlation between self-efficacy and support received and desired and absolute and changes in HbA1c levels revealed some connections between self-efficacy and diabetes management. Self-efficacy and social support received for meal planning, taking medication, feet-related care, physical activity, testing blood sugar, and handling diabetes-related feelings were found to be

significantly associated as well as, self-efficacy and support making a participant feel good. However self-efficacy and diet-related support was not strongly correlated. Our findings suggest that those who are unable to control their diabetes may be more determined to change lifestyles if receiving social support for various diabetes care aspects rather than diet-related support.

Limitations

The most important limitation of this research was the decrease (due to study withdrawal) in the number of participants as the study progressed. The decreasing number of participants created two issues: (1) a loss of statistical power and (2) bias. The first issue of a loss of statistical power resulted in losing the ability to see differences among groups as the study progressed and the groups became smaller. Statistical analyses of data collected at the beginning of the study with numerous participants' responses cannot be confidently compared to statistical analyses of data collected toward the end of the study with fewer participants. The second issue of bias was generated as participants dropped out because dropout was not random. Participants chose to dropout rather than be randomly chosen to be dropped from the study. The participants who stayed in the study until its completion are not representative of those who were in the study at the start.

Another related limitation came as the result of the decreasing number of participants. The decrease in participants factored into the decision to create 3 groups rather than 5 groups for the analyses requiring the various types of support desired and received and congruence of support. If the original 5 groups had been kept as the sample

size decreased, the extreme ends of the spectrum would have had very few participant responses. In groups with less than 10 participant responses, the responses of these participants may have skewed the data for their group if individual participants provided data very different from each other.

CONCLUSION

This study determined that social support received and desired and congruence of support are not associated with changes in HbA1c levels. Also, self-efficacy and social support received were found to be associated, but not self-efficacy and social support desired nor changes in HbA1c levels. This information has the potential to be beneficial in assisting health care professionals who advise patients with diabetes to make lifestyle changes. By understanding that social support received by persons with diabetes is associated with self-efficacy but not changes in HbA1c levels, future research can be focused on finding other factors that may play a role in lowering HbA1c levels. If this future research is conducted, the direction of change (positive or negative) of changes in HbA1c levels should be considered. A factor to investigate which may play a role in lowering HbA1c levels, is the exact source of social support (family, friends, or a combination or both). In addition to the exact source of social support being investigated, researchers can look into the effect of quality versus quantity of social support on changes in HbA1c levels and self-efficacy.

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APPENDICES

Appendix A: Hypothesis 1

Table 1. Association between Support Received and HbA1c at Visits 1 and 2 and HbA1c change at 6 and 12 months*

	Meal Planning	Medicine	Feet	Physical Activity	Blood Sugar Testing	Feelings
HbA1c at Visit 1	F = 0.527 p = 0.756	F = 0.916 p = 0.471	F = 1.693 p = 0.135	F = 2.317 p = 0.043	F = 0.996 p = 0.420	F = 0.451 p = 0.813
HbA1c at Visit 2	F = 0.660 p = 0.654	F = 1.056 p = 0.385	F = 0.673 p = 0.644	F = 1.350 p = 0.244	F = 1.662 p = 0.145	F = 0.758 p = 0.581
HbA1c change at 6 months	F = 0.985 p = 0.428	F = 0.424 p = 0.832	F = 0.719 p = 0.610	F = 0.717 p = 0.611	F = 1.109 p = 0.357	F = 2.610 p = 0.026
HbA1c change at 12 months	F = 1.064 p = 0.381	F = 2.120 p = 0.064	F = 2.019 p = 0.077	F = 1.070 p = 0.378	F = 1.348 p = 0.245	F = 0.826 p = 0.532

*Note: One-way ANOVAs were run for to look at associations between support received at Visits 2 through 6 by absolute and changes in HbA1c levels from 12 to 42 months. Results were similar: there were no significant associations.

Table 2. Association between Support Desired and HbA1c at Visits 1 and 2 and HbA1c change at 6 and 12 months*

	Meal Planning	Medicine	Feet	Physical Activity	Blood Sugar Testing	Feelings
HbA1c1	F = 3.209 p = 0.008	F = 2.284 p = 0.046	F = 3.799 p = 0.002	F = 4.025 p = 0.001	F = 3.418 p = 0.005	F = 4.411 p = 0.001
HbA1c2	F = 1.619 p = 0.156	F = 2.460 p = 0.034	F = 2.601 p = 0.026	F = 1.442 p = 0.210	F = 2.010 p = 0.078	F = 1.400 p = 0.225
HbA1c change at 6 months	F = 1.414 p = 0.220	F = 0.397 p = 0.850	F = 0.420 p = 0.835	F = 1.588 p = 0.164	F = 0.406 p = 0.845	F = 0.679 p = 0.640
HbA1c change at 12 months	F = 0.622 p = 0.683	F = 1.826 p = 0.109	F = 0.840 p = 0.523	F = 0.334 p = 0.892	F = 1.560 p = 0.173	F = 0.622 P = 0.683

*Note: One-way ANOVAs were run for to look at associations between support desired at Visits 2 through 6 by absolute and changes in HbA1c levels from 12 to 42 months. Results were similar: there were no significant associations.

Table 3. Association between Congruence and HbA1c at Visits 1 and 2 and HbA1c change at 6 and 12 months*

	Meal Planning	Medicine	Feet	Physical Activity	Blood Sugar Testing	Feelings
HbA1c at Visit 1	F = 1.960 p = 0.142	F = 0.081 p = 0.922	F = 0.045 p = 0.956	F = 0.902 p = 0.407	F = 1.875 p = 0.155	F = 2.540 p = 0.080
HbA1c at Visit 2	F = 0.085 p = 0.919	F = 0.541 p = 0.583	F = 0.214 p = 0.808	F = 0.017 p = 0.983	F = 0.089 p = 0.915	F = 0.974 p = 0.379
HbA1c change at 6 months	F = 1.420 p = 0.244	F = 0.430 p = 0.651	F = 0.706 p = 0.495	F = 1.695 p = 0.186	F = 2.279 p = 0.105	F = 0.796 p = 0.452
HbA1c change at 12 months	F = 0.686 p = 0.505	F = 1.024 p = 0.361	F = 1.860 p = 0.159	F = 0.045 p = 0.956	F = 3.436 p = 0.034	F = 1.723 P = 0.181

*Note: One-way ANOVAs were run for to look at associations between congruence of support received and desired at Visits 2 through 6 by absolute and changes in HbA1c levels from 12 to 42 months. Results were similar: there were no significant associations.

Table 4. Correlations of Diet-related Support and HbA1c change

	HbA1c change at 6 months	HbA1c change at 12 months	HbA1c change at 18 months	HbA1c change at 24 months	HbA1c change at 30 months	HbA1c change at 36 months	HbA1c change at 42 months
Diet-related support at Visit 1	r = -0.0.40 p = 0.539	r = 0.024 p = 0.732					
Diet-related support at Visit 2		r = -0.064 p = 0.399	r = -0.049 p = 0.534				
Diet-related support at Visit 3			r = -0.019 p = 0.803	r = -0.047 p = 0.557			
Diet-related support at Visit 4				r = 0.010 p = 0.907	r = 0.014 p = 0.867		
Diet-related support at Visit 5					r = -0.057 p = 0.524	r = -0.119 p = 0.208	
Diet-related support at Visit 6						r = -0.174 p = 0.317	r = -0.064 p = 0.722

Appendix B: Hypothesis 1a

Table 1. Correlations of Diet-related Support and Self-efficacy

	Self-efficacy at Visit 1	Self-efficacy at Visit 2	Self-efficacy at Visit 3	Self-efficacy at Visit 4	Self-efficacy at Visit 5	Self-efficacy at Visit 6
Diet-related support at Visit 1	r = 0.251 p < 0.001					
Diet-related support at Visit 2		r = 0.298 p < 0.001				
Diet-related support at Visit 3			r = 0.316 p < 0.001			
Diet-related support at Visit 4				r = 0.136 p = 0.081		
Diet-related support at Visit 5					r = 0.311 p < 0.001	
Diet-related support at Visit 6						r = 0.309 p = 0.070

Table 2. One-way ANOVA of Support Received Making Participants Feel Good about Lifestyle Changes at Visit 1 with HbA1c at 6 and 12 months, HbA1c Change at 6 and 12 months, and Self-Efficacy at Visit 1

	HbA1c at Visit 1	HbA1c at Visit 2	HbA1c Change 6 months	HbA1c Change 12 months	Self-efficacy at Visit 1
0	7.337	7.055	-0.2476	-0.1077	5.6364
1	7.372	7.337	-0.0065	0.0870	5.4886
2	7.463	6.959	0.3976	-0.3105	5.6571
3	7.418	7.442	-0.1791	-0.2945	6.2569
4	7.263	6.998	-0.3333	0.0525	6.8056
F	0.197	1.322	1.172	1.565	3.854
p	0.940	0.262	0.324	0.185	0.004

Table 3. One-way ANOVA of Support Received Making Participants Feel Good about Lifestyle Changes at Visit 2 with HbA1c at 12 and 18 months, HbA1c Change at 12 and 18 months, and Self-Efficacy at Visit 2

	HbA1c at Visit 2	HbA1c at Visit 3	HbA1c Change 12 months	HbA1c Change 18 months	Self-efficacy at Visit 2
0	7.418	7.352	-0.0261	0.2600	4.9259
1	7.293	7.015	-0.2800	0.0410	5.7551
2	7.181	7.223	-0.1367	-0.1917	6.5455
3	7.062	7.165	-0.1296	0.0404	6.7887
4	6.997	7.333	-0.1467	0.4379	7.6579
F	0.541	0.361	0.281	1.072	7.697
p	0.706	0.836	0.890	0.372	<0.001

Table 4. One-way ANOVA of Support Received Making Participants Feel Good about Lifestyle Changes at Visit 3 with HbA1c at 18 and 24 months, HbA1c Change at 18 and 24 months, and Self-Efficacy at Visit 3

	HbA1c at Visit 3	HbA1c at Visit 4	HbA1c Change 18 months	HbA1c Change 24 months	Self-efficacy at Visit 3
0	7.373	7.708	0.4080	0.5680	6.2000
1	7.172	7.498	0.1833	0.3389	5.6458
2	7.468	7.324	-0.1941	0.0548	6.4595
3	7.220	7.402	-0.0400	0.0130	6.7600
4	7.024	7.632	0.2040	0.0087	7.8800
F	0.513	0.396	1.321	1.167	4.974
p	0.726	0.811	0.264	0.327	<0.001

Table 5. One-way ANOVA of Support Received Making Participants Feel Good about Lifestyle Changes at Visit 4 with HbA1c at 24 and 30 months, HbA1c Change at 24 and 30 months, and Self-Efficacy at Visit 4

	HbA1c at Visit 4	HbA1c at Visit 5	HbA1c Change 24 months	HbA1c Change 30 months	Self-efficacy at Visit 4
0	7.396	7.657	0.4391	0.2652	5.7200
1	7.500	7.242	0.0727	-0.0031	6.1538
2	7.253	7.400	0.1031	0.2129	5.6944
3	7.365	7.434	0.0514	-0.1971	6.2778
4	7.590	7.539	0.0357	0.1536	7.4063
F	0.314	0.369	0.574	0.799	2.521
p	0.868	0.831	0.682	0.528	0.043

Table 6. One-way ANOVA of Support Received Making Participants Feel Good about Lifestyle Changes at Visit with HbA1c at 30 and 36 months, HbA1c Change at 6 and 12 months, and Self-Efficacy at Visit 5

	HbA1c at Visit 5	HbA1c at Visit 6	HbA1c Change 30 months	HbA1c Change 36 months	Self-efficacy at Visit 5
0	7.750	7.406	0.1722	0.4571	5.5238
1	7.188	7.454	0.2385	0.2632	5.5000
2	7.800	7.967	0.1417	-0.1727	6.4167
3	7.347	7.368	0.1794	0.1867	7.0857
4	7.765	7.712	-0.0583	-0.1864	7.3846
F	1.343	0.651	0.182	0.735	4.392
p	0.257	0.627	0.948	0.570	0.002

Table 7. One-way ANOVA of Support Received Making Participants Feel Good About Lifestyle Changes at Visit 6 with HbA1c at 36 and 42 months, HbA1c Change at 36 and 42 months, and Self-Efficacy at Visit 6

	HbA1c at Visit 6	HbA1c at Visit 7	HbA1c Change 36 months	HbA1c Change 42 months	Self-efficacy at Visit 6
0	7.286	7.471	0.0143	-0.1200	4.1429
1	7.450	7.800	0.9833	1.3667	5.5000
2	7.400	7.283	0.5833	0.3167	6.5000
3	7.036	7.057	-0.1357	0.0071	6.2857
4	6.100	6.400	0.1000	-0.0500	8.5000
F	0.946	0.829	0.606	0.669	1.746
p	0.451	0.518	0.662	0.619	0.166

Table 8. One-way ANOVA of Self-efficacy by Support Received at Visit 1

	Meal Planning	Medicine	Feet	Physical Activity	Blood Sugar Testing	Feelings
1	5.0794	5.3768	5.4800	5.4833	5.5056	5.1579
2	5.3137	4.8400	4.9333	5.1864	5.4722	4.8000
3	6.0200	6.1593	5.9084	6.1383	6.0730	6.0534
4	6.1333	5.4737	6.1111	5.9035	5.5536	6.3750
5	7.0149	6.7879	7.0656	7.2034	7.1228	7.1290
6	6.1333	6.0769	6.1905	6.1724	6.1321	6.2000
F	4.932	4.629	4.185	4.744	3.695	6.835
p	< 0.001	< 0.001	0.001	< 0.001	0.003	< 0.001

Table 9. One-way ANOVA of Self-efficacy by Support Received at Visit 2

	Meal Planning	Medicine	Feet	Physical Activity	Blood Sugar Testing	Feelings
1	5.0909	5.7097	5.8649	5.6087	5.8125	5.6129
2	5.4667	5.6250	5.1176	5.6667	5.5833	5.8182
3	6.3864	6.2656	6.0253	6.1864	5.9589	6.0256
4	6.5479	6.1250	6.6364	6.6207	6.5806	6.5000
5	7.5238	7.1579	7.8919	7.2750	7.9268	7.9750
6	7.7000	7.4286	7.6111	8.0909	7.2000	7.1765
F	5.239	3.051	6.349	3.664	5.915	5.746
p	< 0.001	0.011	< 0.001	0.003	< 0.001	< 0.001

Table 10. One-way ANOVA of Self-efficacy by Support Received at Visit 3

	Meal Planning	Medicine	Feet	Physical Activity	Blood Sugar Testing	Feelings
1	5.8438	6.3000	6.2381	6.1613	6.1429	6.1892
2	5.3333	6.1538	5.6000	5.0417	5.4737	5.002
3	6.4706	6.2000	6.4915	6.7292	6.7647	6.7091
4	6.7193	6.0000	6.3000	6.6727	6.1481	6.6296
5	7.4474	7.5227	7.7692	7.3929	7.5806	7.3514
6	7.5000	6.4444	6.5000	7.3333	6.4737	6.4167
F	3.925	2.697	2.535	3.719	3.009	3.592
p	0.002	0.022	0.030	0.003	0.012	0.004

Table 11. One-way ANOVA of Self-efficacy by Support Received at Visit 4

	Meal Planning	Medicine	Feet	Physical Activity	Blood Sugar Testing	Feelings
1	5.9500	6.6774	6.6667	6.0000	6.6176	6.8710
2	5.7619	6.2143	6.0625	5.9231	5.1875	5.8235
3	5.7714	5.2381	5.2830	5.8293	5.6170	5.2909
4	6.1667	6.2222	6.3043	6.5294	6.4194	5.8947
5	6.8250	6.8250	7.0370	6.6563	7.0741	7.4333
6	7.3333	6.6875	7.2222	6.9231	6.6667	6.9412
F	1.365	2.139	3.025	0.803	2.080	4.083
p	0.240	0.063	0.012	0.549	0.070	0.002

Table 12. One-way ANOVA of Self-efficacy by Support Received at Visit 5

	Meal Planning	Medicine	Feet	Physical Activity	Blood Sugar Testing	Feelings
1	5.2667	6.0833	6.2143	5.8261	6.0968	6.1034
2	5.9130	6.3000	5.7692	5.8276	5.6923	5.7857
3	6.2432	5.9189	5.7949	6.4848	6.0976	5.9773
4	5.9063	5.8824	5.2941	5.9474	5.7857	5.5833
5	8.3043	7.6000	8.4500	7.5769	7.7500	8.1667
6	7.2000	6.2353	7.1111	7.0000	6.8333	6.5000
F	4.853	2.188	5.557	2.1777	2.394	3.862
p	< 0.001	0.059	< 0.001	0.061	0.041	0.003

Table 13. One-way ANOVA of Self-efficacy by Support Desired at Visit 1

	Meal Planning	Medicine	Feet	Physical Activity	Blood Sugar Testing	Feelings
1	7.1250	6.3793	6.2597	7.2308	6.3247	6.4286
2	6.2000	6.0741	5.8947	7.2727	6.4583	6.1071
3	5.7313	5.6957	5.6825	5.9000	5.8347	5.8850
4	5.7680	5.4808	5.8525	5.7615	5.4727	5.8500
5	5.9686	6.0952	6.0125	5.7679	5.8842	5.7826
6	6.6154	6.2600	6.4259	7.1364	6.4091	6.6667
F	1.665	1.305	0.918	3.322	1.273	0.983
p	0.142	0.261	0.469	0.006	0.274	0.428

Table 14. One-way ANOVA of Self-efficacy by Support Desired at Visit 2

	Meal Planning	Medicine	Feet	Physical Activity	Blood Sugar Testing	Feelings
1	6.3846	6.5682	6.5556	6.5000	6.7429	6.6400
2	6.1818	6.0000	5.1333	6.2667	5.8000	4.9286
3	6.4074	6.0526	6.1139	6.5435	6.2500	6.1860
4	6.1186	5.7273	6.4643	6.1692	5.8947	6.5769
5	6.5556	7.0263	6.9535	6.3824	6.5283	6.8039
6	8.4545	7.6000	7.7222	8.5455	7.7368	7.5263
F	1.892	2.692	2.769	1.984	1.814	2.501
p	0.097	0.022	0.019	0.082	0.111	0.032

Table 15. One-way ANOVA of Self-efficacy by Support Desired at Visit 3

	Meal Planning	Medicine	Feet	Physical Activity	Blood Sugar Testing	Feelings
1	7.5714	6.1556	6.8056	6.8125	6.3143	6.6923
2	6.3000	6.7500	6.6667	7.8571	6.9231	6.1429
3	6.8000	6.4154	6.2500	7.0263	6.4407	6.7258
4	6.2391	6.0000	6.0789	6.1639	6.1290	6.2258
5	6.1692	7.2857	7.2143	6.2923	6.9750	6.3750
6	8.0000	7.0000	6.6154	7.6667	6.5833	7.0000
F	1.923	1.376	1.205	1.646	0.707	0.460
p	0.092	0.235	0.309	0.150	0.619	0.806

Table 16. One-way ANOVA of Self-efficacy by Support Desired at Visit 4

	Meal Planning	Medicine	Feet	Physical Activity	Blood Sugar Testing	Feelings
1	7.8421	6.8846	7.1905	7.2500	7.0286	7.2121
2	5.7500	5.8182	5.7143	6.0000	6.2500	5.6000
3	6.2308	5.1667	5.4615	6.4194	5.8621	5.8393
4	6.1795	6.5789	6.2083	6.1087	6.2593	6.0000
5	5.8571	6.6522	6.4167	5.9455	6.0345	6.5000
6	6.5714	6.8750	6.8462	6.5714	6.6250	6.4444
F	1.985	3.085	2.627	0.895	1.031	1.564
p	0.084	0.011	0.026	0.486	0.401	0.173

Table 17. One-way ANOVA of Self-efficacy by Support Desired at Visit 5

	Meal Planning	Medicine	Feet	Physical Activity	Blood Sugar Testing	Feelings
1	7.5385	6.2857	6.7273	7.8571	6.6538	6.6923
2	5.5000	5.8333	5.7143	6.3333	5.4118	5.3529
3	7.1333	6.1795	6.0270	7.1739	6.5750	6.7429
4	5.6585	5.6428	5.7143	5.7647	5.7500	5.1739
5	6.1429	7.5000	7.0000	5.8200	6.2500	6.8276
6	8.0000	6.6923	6.8182	8.6000	8.1250	8.8000
F	3.098	1.511	1.178	3.842	1.786	3.636
p	0.011	0.191	0.323	0.003	0.120	0.004

Table 18. Correlations of HbA1c change at 6 and 12 months, HbA1c at Visit 1 and Visit 2, and Self-Efficacy at Visit 1

	HbA1c Change at 6 months	HbA1c Change at 12 months	HbA1c at Visit 1	HbA1c at Visit 2	Self-efficacy at Visit 1
HbA1c Change at 6 months	1	r = 0.486 p < 0.001	r = -0.424 p < 0.001	r = 0.231 p < 0.001	r = 0.076 p = 0.240
HbA1c Change at 12 months		1	r = -0.446 p < 0.001	r = -0.180 p = 0.014	r = 0.072 p = 0.288
HbA1c at Visit 1			1	r = 0.784 p < 0.001	r = -0.036 p = 0.480
HbA1c at Visit 2				1	r = -0.081 p = 0.214
Self-efficacy at Visit 1					1