The Healing Power of Education: A Study of the Effectiveness of Diabetic Education within the Jackson-Hinds Comprehensive Health Center Patient Population

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Introduction

"The goal of the process is to enable the patient to become the most knowledgeable and hopefully the most active participant in his or her diabetes care." Clement 1995

Nationally, diabetes affects about 7.5-10.0% of the population according to the 2012 America's Health Rankings' Annual Report. In Mississippi, however, according to that same report, diabetes affects between 12-16% of the population, ranking Mississippi as number 50 in the area of diabetes. At the same time Mississippi ranks as number 42 in Health Insurance Coverage, 50 in both obesity and physical inactivity, 48 in primary care physicians, and number 49 in all determinants, tying with Louisiana. Mississippi is no stranger to diabetes and the challenges its population faces with the management of this epidemic. The cornerstone of diabetes management in type two diabetics is patient education. Lifestyle is a fundamental determinate of treatment regimens, and proper education is the most important way to alter lifestyle. However, there are a number of different ways to educate a patient. This project aimed at determining how lifestyle change through education can impact the long-term management of diabetes, what forms of education are most successful in producing impactful and long-lasting lifestyle change within Mississippi, and how can the best means of education be spread to at risk populations.

Background

Clement (1995) addressed the deficits in diabetic patient education with a literature review of nonrandomized and short-term randomized studies of self-management education. He noted that while patient education is universally accepted as the corner stone of diabetes control, few studies served to take a deeper look at how to educate patients and why current methods aren't working to curtail the rising numbers of new diabetic diagnoses. Despite efforts, diabetic patients, 50-80%, remain deficient in areas such as medication administration, glucose testing, diet, sick day guidelines, and foot care. Clement noted the components of successful diabetic education as outlined by the National Diabetes Advisory Board in 1983 to be as follows:

1. An assessment of their educational needs.
2. Comprehensive instruction tailored to those needs.
3. A follow-up assessment to identify educational deficiencies.
4. Educational results communicated to the referring physician

The studies reviewed followed these guidelines and found largely that the positive results were not found with simply teaching the facts on diabetes, but most success came from educating patients on how to live in control of their diagnosis.

Prior to Clement's review, Wilson and Pratt (1987) and Rubin, Peyrot, and Saudek (1991) explored different approaches to diabetes education that helped shape the lessons learned found in Appendix A. Wilson and Pratt (1987) studied how the addition of peer support added to diabetic education affected the success of patient treatment in elderly patients. In

their study, they divided 79 subjects randomly into three groups; education, education and peer support, and control. They found that adding peer support to the educational process helped to lower weight and reduce glucose levels.

Rubin, Peyrot, and Saudek (1991) aimed to determine how education affected self-management versus life-style behaviors. Their study included 165 individuals who participated in a 5-day education program at Johns Hopkins Diabetes Center. They found that while little long-term effects were seen in lifestyle changes, many patients benefited through self-regulation by maintaining a clinically normal HbA1c.

Clement presented Appendix A "Lessons learned from nonrandomized and short-term randomized studies of self-management", and suggested that future studies focus on assessing different types of education for different demographics and improving innovation in educational programs.

In the eighteen years since Clement (1995), many others have addressed the challenges presented by the review's conclusion. Rickheim, Weaver, Flader, and Kendall (2002) wrote an "Assessment of Group Versus Individual Diabetes Education". For their study they randomly divided patients into two categories of individual education and group education. This study focused on newly diagnosed type 2 diabetes patients that have no previous diabetic educational classes. Both groups focused on the topics of carbohydrate and portion limiting, meal timing, glucose monitoring, exercise, foot care, and self-management problem solving. Educators for this study were trained on variation in these topics, as well as, group dynamics

and diabetic drug classes. HbA1c, knowledge testing, and behavioral outcomes were measured at baseline, 2 weeks, 3 months, and 6 months. This study was unable to find any significant differences in treatment outcomes between individual education and group education. Both groups, however, demonstrated a reduction in physician office calls and visits and a decrease in need for additional individual counseling.

Izquerdo, Knudson, Meyer, Kearns, Ploutz-Snyder, and Weinstock (2003) took a different approach to diabetic education by comparing diabetic education through telemedicine with face-to-face education. Their patient population, including 56 randomly selected adults with diabetes, was divided into two groups; "in person education" (control) group and telemedicine group. Patients in the telemedicine group were found to be very satisfied with their educational experience. Both groups saw significant improvement in HbA1c, but no significant difference between the two groups could be noted. They, thus, found both methods to be equally effective in improving patient outcomes through education.

Gerber, Brodsky, Lawless, Smolin, Arozullah, Smith, Berbaum, Heckerling, and Eiser (2005) brought even more innovation to diabetic patient education when they attempted to implement and evaluate the use of a low-literacy diabetes education computer multimedia application. The study randomized 240 subjects into the two study groups; a multimedia group and traditional intervention group (control). "The intervention [included] audio/video sequences to communicate information, provide, psychological support, and promote diabetes self-management skills without extensive text or complex navigation" Gerber, et al (2005). The study showed an actual increase in diabetes complications in the multimedia

group, with the lower health literacy group being the most affected. The study also found that the subjects with a higher health literacy spent more time on the program than the lower literacy subjects.

More "lessons learned" can now be added to Clement (1995) Table 1. While all studies have shown significant increases in positive patient outcomes through various types of education, no study has been able to identify what types of education work best. Diabetes education, however, has yet to curtail the rising numbers in incidence in type II diabetes. Future studies must focus on specific population demands in order to find the best means of education for differing lifestyles. What will work in certain age groups may not be the best form of education of other age groups. In addition, education that may reach patients in some geographic areas may not be the optimal form of education in other areas. Successful diabetic education must be multifaceted in order to reach a variety of lifestyles, literacies, and age groups. However, the vastness of these variations severely limits the success of these types of studies.

Methodology

This project will aim at determining how lifestyle change through education impacts the long-term management of diabetes, what forms of education are most successful in producing impactful and long-lasting lifestyle change, and how can the best means of education be spread to at risk populations. My goal will be to assess the current forms of diabetic education currently offered and Jackson-Hinds Comprehensive Health Center and develop a Diabetic Friendly Grocery List that will act as a companion to already existing literature.

First, I met with the Jackson-Hinds Comprehensive Health Center diabetes education coordinators, which included JHCHC Director of Nursing, Glendora Singleton and Medical Assistant, Emily Matlock, to learn and understand their current forms of diabetes education. I, also, spoke with the Director of Adult Medicine, Dr. Debra Rice, to develop an idea of the Health Center's adherence to their diabetic education plan. Emily Matlock helped me gather all the diabetic education materials that Jackson-Hinds has available for their diabetic patients. (See Appendix B). I attended one of the clinic's diabetic education seminars, which was held for the clinic's staff by a pharmaceutical salesman.

The following week I began to build the diabetic friendly grocery list based on the recommendations of the American Diabetes Association recommendations and sample-shopping list. I then visited the local grocery stores, including Wal-Mart and Kroger, to better understand the limitations on current Nation-wide "diabetic grocery lists". I wanted to assess the availability of healthy options to the Jackson-Hinds patient population (See Appendix C).

Next, I attempted to address two other concerns with the "diabetic diet" in Mississippi, comfort and cost. The idea that patients need to build healthier meals starts with healthier ingredients; however, patients may be less inclined to buy the ingredients if they don't have an idea of how to use them once they get home. Therefore, I began working on compiling a sample recipe book that used only the ingredients on the list, but at first glance looked like Southern comfort foods. I spent the remainder of week three preparing the recipes I had compiled, and testing them against the taste buds of "Southern folks" (my family) (See Appendix I). In addition to evaluating the options in the stores and the fear of different ingredients, I wanted to address the concern that eating healthy tends to cost more. The providers at Jackson-Hinds had expressed to me, on first review of the grocery list, that their patients may not be able to afford the items on the list. Visiting the local grocery stores again, I priced the grocery list for a family of four for one month, using the sample recipes as a menu.

During the fourth week, I prepared for a Diabetic Health event, at which I planned to meet with twenty patients to present them a survey of their current diabetic education and to hand out the grocery list along with the companion recipe booklet. Unfortunately, time and resources continued to post-pone the event. I, therefore, had to improvise by holding a mini diabetic health event on Wednesday of the fifth week. At the event, diabetic patients were brought in after their scheduled routine care appointment for the day. I provided them with breakfast in the form of one of the many diabetic friendly recipes, had them complete a ten-question survey on how they felt about their diabetic education up to this point, and handed out the grocery list while answering any questions from the patients (See Appendix D and E).

Because the event only generated eight surveyed patients, I returned to the clinics the following day and pulled diabetic patients before their daily appointments to administer the survey, give them the grocery list, and again answer any questions.

Following the evaluation of the patients' feelings on their diabetic education, I worked with Ms. Matlock to record the Hemoglobin A1c levels of all the patients surveyed for comparison on their feelings toward their education and their actual diabetic management.

Results

First, I found that the Jackson-Hinds Comprehensive Health Center holds a 6-session course for their diabetic patients with sessions every 1-2 weeks focusing on getting to know diabetes, staying well with diabetes, basic nutrition, goal setting, blood glucose monitoring, stress, depression and diabetes, physical activity, medications, preventing complications, and activities such as, glucometer reading, exercises, carbohydrate counting, nutritional label reading, and cooking demonstrations. These courses are provided to both new and previously diagnosed diabetic patients from the main clinic of Jackson-Hinds Comprehensive Health Center and referrals from other Jackson-Hinds clinics. Ages of these patients range from 30 years and up. However, due to recent changes in electronic medical records, the facility has not been able to hold a course since March or April. Although some time has lapsed since the last diabetic course, the sampling of patients surveyed from the Jackson-Hinds Comprehensive main center seemed satisfied with the amount of diabetic education they have received. See Appendix F.

Following the event the hemoglobin A1c levels of the patients surveyed were gathered and charted. The target HbA1c level is below 6.5-7. See Appendix G.

The second part of my project considered the availability and affordability of a diabetic healthy diet based on grocery store purchases. Cost was determined based on a sample menu pulled from the recipes compiled for the grocery list's companion recipe book. The cost was considered for a family of four for one month. See Appendix H.

Discussion

While the majority of the patients surveyed, were satisfied or somewhat satisfied in the diabetic education they have received, there were some deficits in the areas surveyed. Most of the deficits were found in the areas dealing with diet and the act of purchasing diabetic appropriate foods. These findings were further reflected in the discussions following the handing out of the grocery list. When presenting the grocery lists to the patients, I explained to them that the list could be used to build a pantry of appropriate ingredients and that if they felt like they could use some help in that area, that the list can be reused over and over again. Without exception, all of the patients surveyed expressed need of this type of list in their everyday lives. Many of the patients also had questions concerning the appropriate foods they should be eating and how they may prepare the foods they like to eat. Additionally, the Hemoglobin A1c levels of the patients surveyed showed that a little over half of the patients surveyed have not reached the target of management in last three months.

Looking through the results of the survey, also, raises a few other questions that should be answered in the future. Determining what types of education patients have received in the past and which forms of education they felt to be the most helpful would help to evaluate which direction the diabetic education program at Jackson-Hinds should go.

In evaluating the grocery list for cost, I found that the cost of the sample grocery list cost almost 40% less than the determined average cost of food for a family of four for one month

shopping on a "thrifty" level according to the Official USDA Food Plans: Cost of Food at Four Levels; US Average; January 2012. In order to evaluate the usefulness of the grocery list, however, some follow-up is needed. Future evaluations should aim at determining if the patients were able to successfully use the list while grocery shopping, did they find ease in using the items in their meal plans, and how did their grocery budget on the Diabetic Friendly Grocery List compare to their normal grocery spending.

Recommendations and Conclusion

Going forward, the basic layout of the Jackson-Hinds Comprehensive Health Center's Diabetic Education Course seems to be very beneficial to its patients. Continuing and initiating education in the previously and newly diagnosed patients is essential to proper diabetic management. As they continue with the courses, I would also suggest frequent surveying of the involved patients to adjust for understanding of the material. Adding the Diabetic Friendly Grocery List to the Nutrition and Diet portion of the course may help to simplify the appropriate dietary needs of a patient with diabetes. Further evaluation of the usefulness of the handout would also be helpful in continuing to shape an educational program that will allow Jackson-Hinds' patients to regain control of their diagnosis and health.

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Appendix A

Lessons learned from nonrandomized and short-term randomized studies of self-management.

Lessons learned	Reference
1. Learning about diabetes is necessary but not sufficient to ensure enhanced behaviors, diabetes control, or weight control. The education program must provide encouragement, use behavioral strategies, and be coupled with expert adjustment of medication to obtain the desired outcome.	55–60
2. A program that does not include regular follow-up education is unlikely to result in long-term success. Positive reinforcement at regular intervals is needed.	55,61,62
3. The frequency of instructional sessions and the attitude reflected by the instructors may be more important in determining outcomes than the teaching style used (i.e., problem based vs. interactive lecture).	55
4. Small group and one-on-one sessions may be equally effective in enhancing self-care behaviors and glycemic control. The optimum program may be one that uses both formats.	63,64
5. The use of practical demonstrations or models to represent food or other aspects of diabetes care can facilitate learning of diabetes principles.	65,66
6. One year after education, glucose monitoring and insulin self-adjustment behaviors are more likely to be maintained than exercise and diet behaviors.	67
7. User error in SMBG results can be significantly decreased (22 to 9% of reference value) with adequate instruction by a qualified diabetes educator.	68
8. Frequent SMBG and instruction on how to self-adjust insulin, diet, and exercise based on the SMBG data are essential for improving glycemic control in type I and insulin-treated type II diabetic patients. SMBG without instruction on how to use the data has minimal usefulness.	50,69–75
9. A structured education and treatment program that incorporates frequent education visits and behavioral change strategies improves glycemic control regardless of the method used for monitoring glucose levels in type II diabetic patients not using insulin.	76–78
10. For type I diabetic patients, meticulous prevention of hypoglycemia through intensive education and counseling results in a reversal of hypoglycemic unawareness. Education designed to teach patients how to recognize their symptoms of hypoglycemia results in a three-fourths reduction in automobile accidents and a one-third reduction in severe hypoglycemic episodes without sacrificing glycemic control.	79–80
11. Computerized or programmed self-instruction augments but does not replace the role of the diabetes educator or dietitian.	81–86
12. Monthly group meetings of young adults with type I diabetes with health educators can markedly improve glycemic control (mean HbA_1 reduction: 2.3 points).	87
13. Addition of social learning to traditional diabetes education enhances glycemic control in type I diabetic adolescents.	88
14. Education sessions for type I diabetic adolescents that incorporate the entire family lead to more family cohesion, less conflict, and improved glycemic control.	89
15. Simplified nutritional counseling based on reducing intake of concentrated sugars, fat, and increasing soluble fiber may be as effective as and easier to learn than the exchange system for type II diabetic patients.	62,90–94
16. Elderly persons are avid learners and are able to make lifestyle changes. Factors that enhance learning and behaviors are using peer support and encouraging attendance and participation by spouses.	95–97
17. Type II diabetic patients diagnosed by screening programs can often achieve normal glucose tolerance for years after adopting a lifestyle encompassing a reduced calorie intake and increased physical activity.	98
18. The use of controlling and directive communication toward patients is counterproductive. Communication that encourages patients to raise questions and participate in decision making is associated with improved glycemic control and self-care.	99,100

Clement, S. (1995). Diagetes Self-Management Education. *Diabetes Care*, *18*(8), 1204-1214.

Table 2

Appendix B

Jackson-Hinds Comprehensive Health Center Diabetes Education Literature

Appendix C

Your Diabetic Friendly Grocery List

Produce
- ⊡ Apples
- ⊡ Strawberries
- ⊡ Blackberries
- ⊡ Blueberries
- ⊡ Pears
- ⊡ Bananas
- ⊡ Grapes
- ⊡ Small oranges
- ⊡ Grapefruit
- ⊡ Lemons
- ⊡ Brussels sprouts
- ⊡ Carrots
- ⊡ Celery
- ⊡ Cauliflower
- ⊡ Green onions
- ⊡ Onions
- ⊡ Garlic
- ⊡ Peppers
- ⊡ Squash
- ⊡ Tomatoes
- ⊡ Lettuce
- ⊡ Cilantro
- ⊡ Green beans
- ⊡ Mushrooms
- ⊡ Asparagus
- ⊡ _____
- ⊡ _____
- ⊡ _____

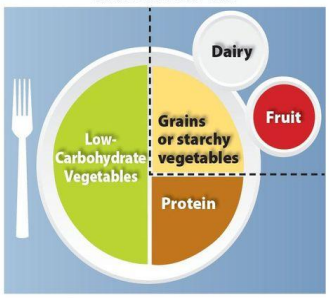
Deli
- ⊡ Turkey (low sodium)
- ⊡ Turkey bacon
- ⊡ Cheese (reduced-fat)
- ⊡ _____
- ⊡ _____
- ⊡ _____
- ⊡ _____
- ⊡ _____

Frozen Foods
- ⊡ Fruit
- ⊡ Vegetables
- ⊡ Frozen meals (lower-sodium, lean options only)

Meats
- ⊡ Fish fillets
- ⊡ Shrimp
- ⊡ Frozen chicken breast (boneless, skinless)
- ⊡ _____
- ⊡ _____
- ⊡ _____
- ⊡ _____
- ⊡ _____

Dairy
- ⊡ Milk (skim or 1-2%)
- ⊡ Yogurt (non-or low-fat)
- ⊡ Cottage cheese (low-fat)
- ⊡ Margarine (trans-free)
- ⊡ Eggs (or egg substitute)
- ⊡ _____
- ⊡ _____
- ⊡ _____
- ⊡ _____

Eat What You Love, Love What You Eat with Diabetes Plate



Baked Goods
- ⊡ 100% whole wheat bread
- ⊡ 100% whole wheat pita bread
- ⊡ Whole wheat crackers
- ⊡ _____
- ⊡ _____

Nonperishables, etc.
- ⊡ Canned vegetables
- ⊡ Canned fruit (canned in juice)
- ⊡ Canned beans (low-sodium)
- ⊡ Canned salmon or tuna
- ⊡ Instant oatmeal or quick oats
- ⊡ Cereal wholegrain
- ⊡ Pasta (whole wheat)
- ⊡ Brown rice
- ⊡ Dried fruit
- ⊡ Nuts
- ⊡ Peanut butter
- ⊡ Seeds (sunflower)
- ⊡ Popcorn (light)
- ⊡ Spaghetti sauce
- ⊡ Soup (low-sodium versions)
- ⊡ _____
- ⊡ _____
- ⊡ _____
- ⊡ _____
- ⊡ _____
- ⊡ _____
- ⊡ _____

Spices
- ⊡ Balsamic vinegar
- ⊡ Whole wheat flour
- ⊡ Pepper
- ⊡ Spices
- ⊡ Dried herb or spice blends (salt-free)
- ⊡ Salt substitute
- ⊡ Cooking sprays
- ⊡ Canola oil
- ⊡ Olive oil
- ⊡ _____
- ⊡ _____
- ⊡ _____
- ⊡ _____
- ⊡ _____
- ⊡ _____

Other

Check the label. If the item has:
< 10 g Carb
< 5 g Sugar
<140 mg Sodium,
add it to the list.
- ⊡ _____
- ⊡ _____
- ⊡ _____
- ⊡ _____
- ⊡ _____

Based on Recommendations of The American Diabetes Association and Diabetesandmindfuleating.com
For more grocery list help visit: www.diabetes.org/mfa-recipe

Appendix D

1. During your last visit, did you discuss your diabetic health concerns with your healthcare provider?

__Yes
__No

2. Has your healthcare provider given you easy to understand information about your diabetic health concerns?

__Yes, definitely
__Yes, somewhat
__No

3. Has your healthcare provider explained a diabetic diet in a way that was easy to understand?

__ Yes, definitely
__Yes, somewhat
__No

4. In the last 12 months, have you made an appointment for routine care with your healthcare provider?

__Yes
__No

5. In the last 12 months, how many times did you visit your healthcare provider for reasons outside of routine care?

__None

__1 time
__2
__3
__4
__5 to 9
__10 or more times

If so, what were the visits for?

_____
_____

6. In a typical day, how many of your meals or snacks include carbohydrates (bread, rice, pasta, bread, potatoes, butter beans, peas, and corn)?

__ 1-3 servings
__4-6 servings
__More than 6 servings

7. In a typical day, how many of your meals or snacks include vegetables?

__ 1-3 servings
__4-6 servings
__More than 6 servings

8. In a typical day, how many of your meals or snacks include fruit?

__1-3 servings

__4-6 servings

__More than 6 servings

9. How would you rate your grocery shopping habits based on the diabetic education you have received in the past?

__My habits reflect a healthy diabetic friendly diet.

__My habits somewhat reflect a healthy diabetic friendly diet.

__My habits do not reflect a healthy diabetic friendly diet.

__I have not received enough diabetic education.

10. Overall, how satisfied have you been with you diabetic education resources?

__ Very satisfied

__ Somewhat satisfied

__Dissatisfied

__I have not received any diabetic education resources

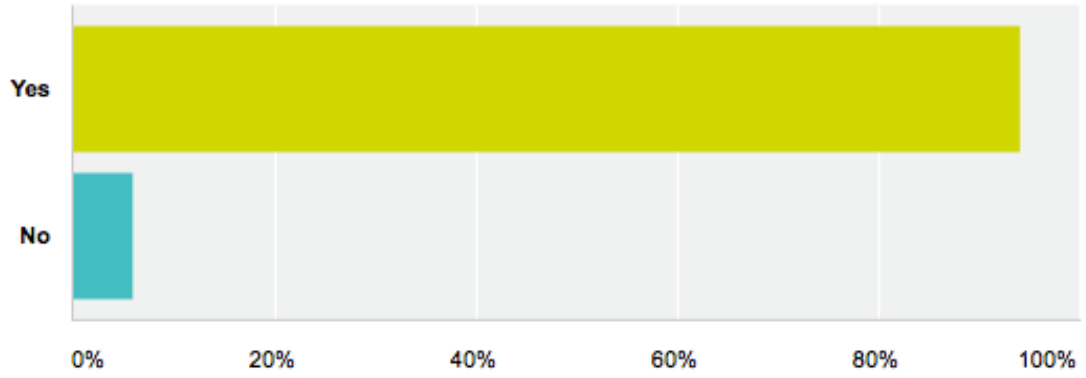
Appendix E

Photos from Diabetes Day at Jackson-Hinds Comprehensive Health Center July 17, 2013. (Top left: Diabetes Day breakfast featuring Spinach Omelet Roll-up and a cup of berries, Top right: Ipad for patients to complete their surveys, Center right: Table of food with a stack of Diabetic Friendly Recipe Books, Bottom left: Stack of Diabetic Friendly Grocery Lists with dry-erase markers for re-use on the laminated finish, Bottom right: Display of the American Diabetes Association: My Food Advisor website.)

Appendix F

During your last visit, did you discuss your diabetic health concerns with your healthcare provider?

- Answered: 17
- Skipped: 0

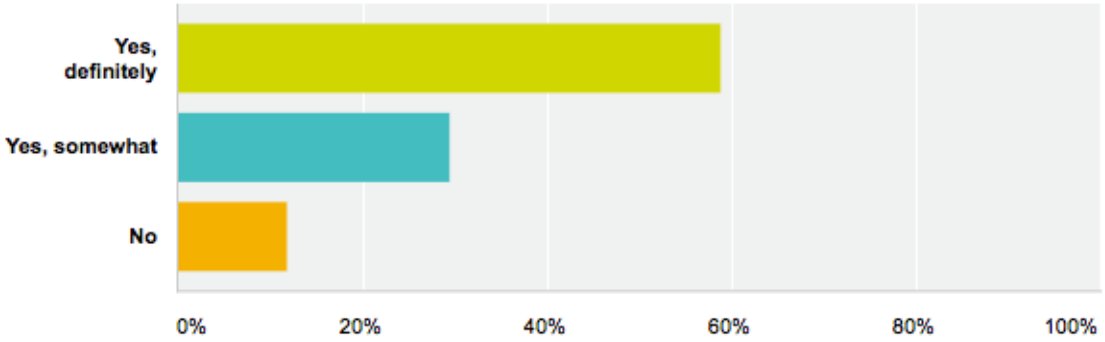


Answer Choices	Responses
Yes	94.12% 16
No	5.88%

Answer Choices	Responses
	1
Total	17

Has your healthcare provider given you easy to understand information about your diabetic health concerns?

- Answered: 17
- Skipped: 0

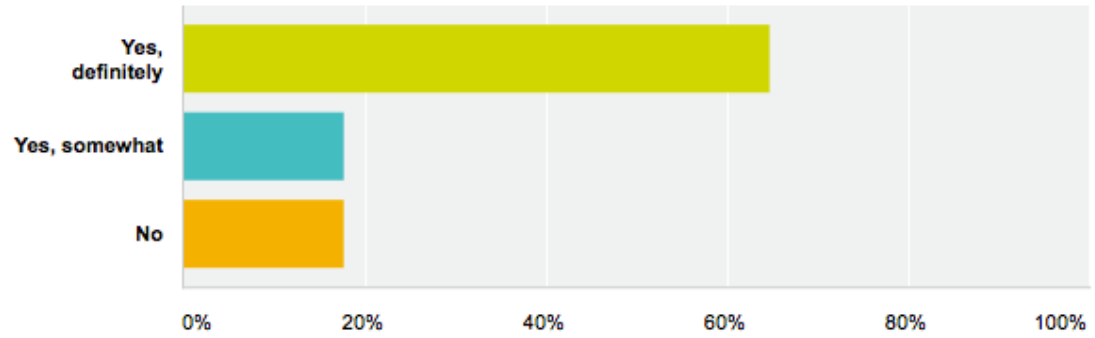


Answer Choices	Responses
Yes, definitely	58.82%

Answer Choices	Responses
	10
	29.41%
Yes, somewhat	
	5
	11.76%
No	
	2
Total	17

Has your healthcare provider explained a diabetic diet in a way that was easy to understand?

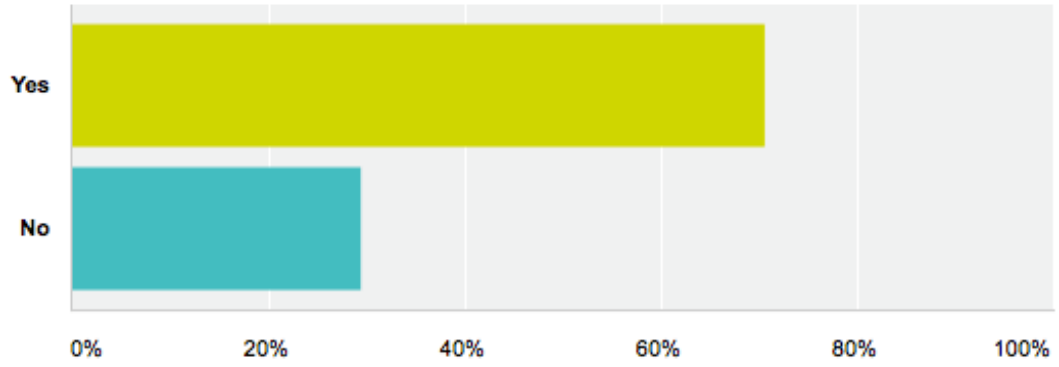
- Answered: 17
- Skipped: 0



Answer Choices	Responses
Yes, definitely	64.71% 11
Yes, somewhat	17.65% 3
No	17.65% 3
Total	17

In the last 12 months, have you made an appointment for routine care with your healthcare provider?

- Answered: 17
- Skipped: 0

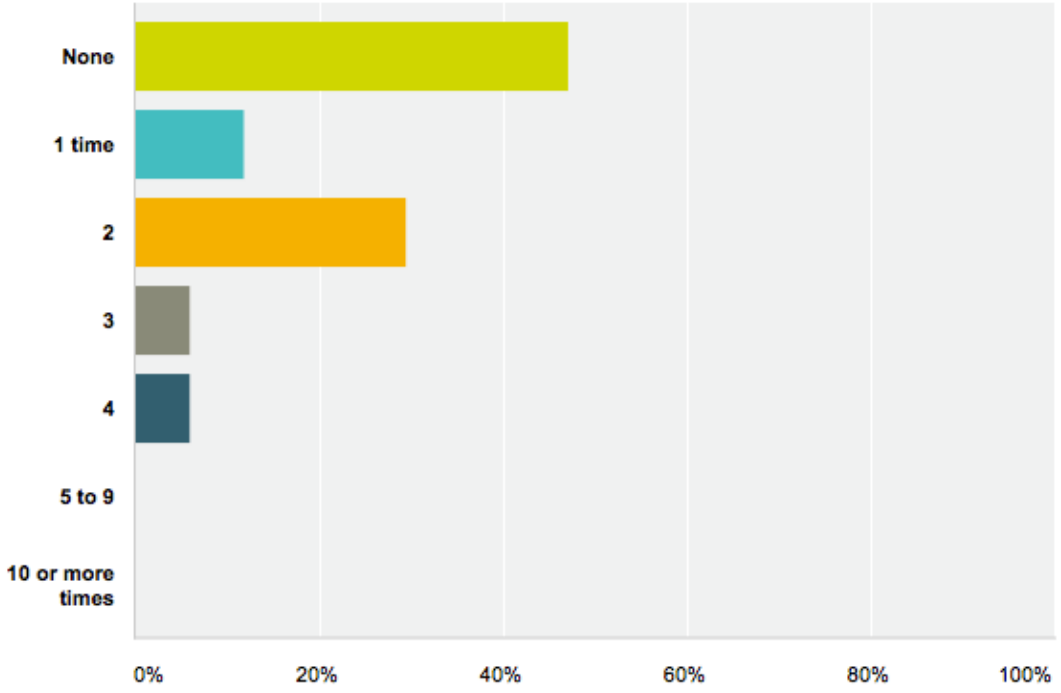


Answer Choices Responses

Yes	70.59%	12
No	29.41%	5
Total		17

In the last 12 months, how many times did you visit your healthcare provider for reasons outside of routine care?

- Answered: 17
- Skipped: 0

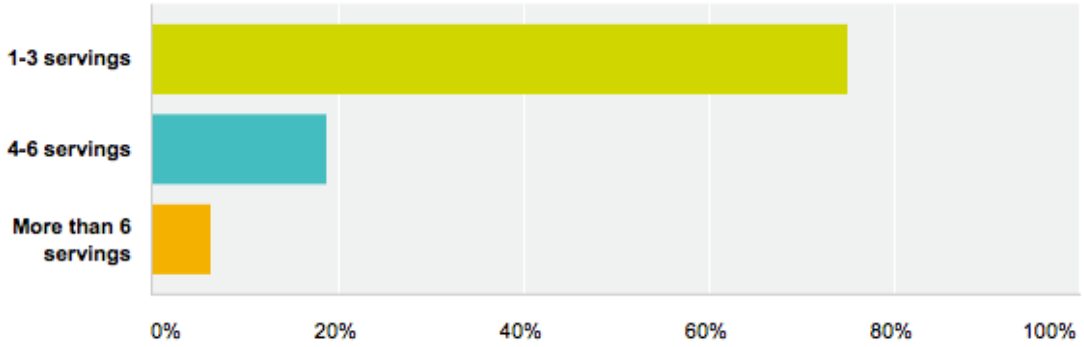


Answer Choices Responses

Answer Choices	Responses	
None	47.06%	8
1 time	11.76%	2
2	29.41%	5
3	5.88%	1
4	5.88%	1
5 to 9	0%	0
10 or more times	0%	0
Total		17

In a typical day, how many of your meals or snacks include carbohydrates (bread, rice, pasta, bread, potatoes, butter beans, peas, and corn)?

- Answered: 16
- Skipped: 1



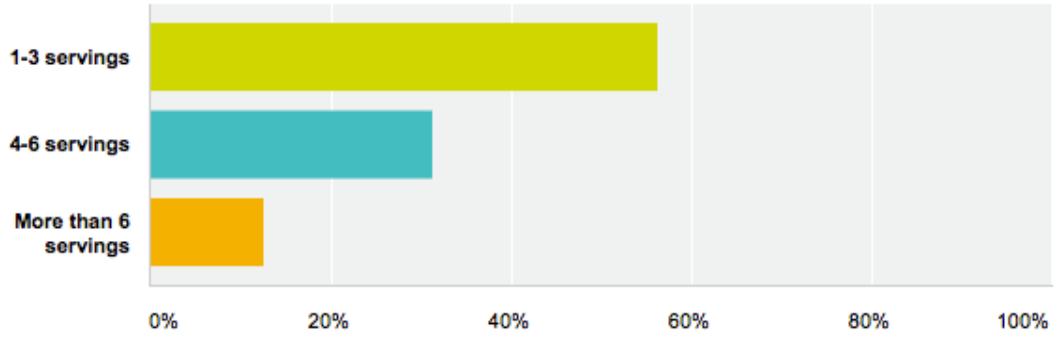
Answer Choices	Responses	
1-3 servings	75%	12
4-6 servings	18.75%	3

Answer Choices	Responses
More than 6 servings	6.25% 1

Total Respondents: 16

In a typical day, how many of your meals or snacks include vegetables?

- Answered: 16
- Skipped: 1



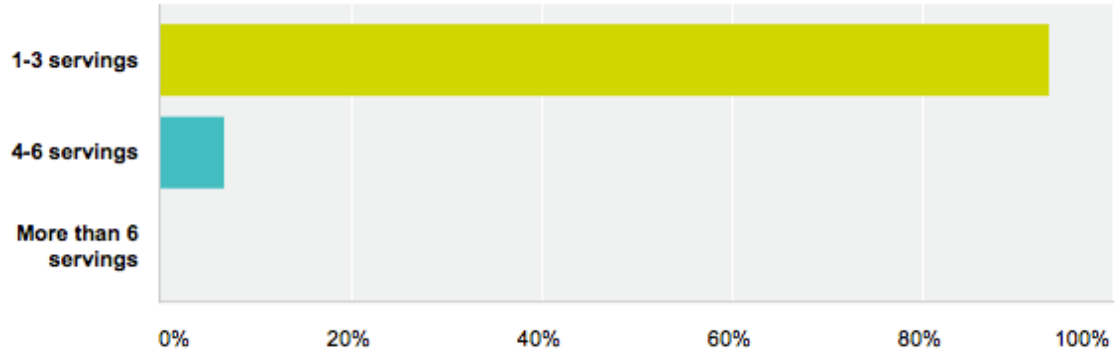
Answer Choices	Responses

Answer Choices	Responses
1-3 servings	56.25% 9
4-6 servings	31.25% 5
More than 6 servings	12.50% 2

Total Respondents: 16

In a typical day, how many of your meals or snacks include fruit?

- Answered: 15
- Skipped: 2

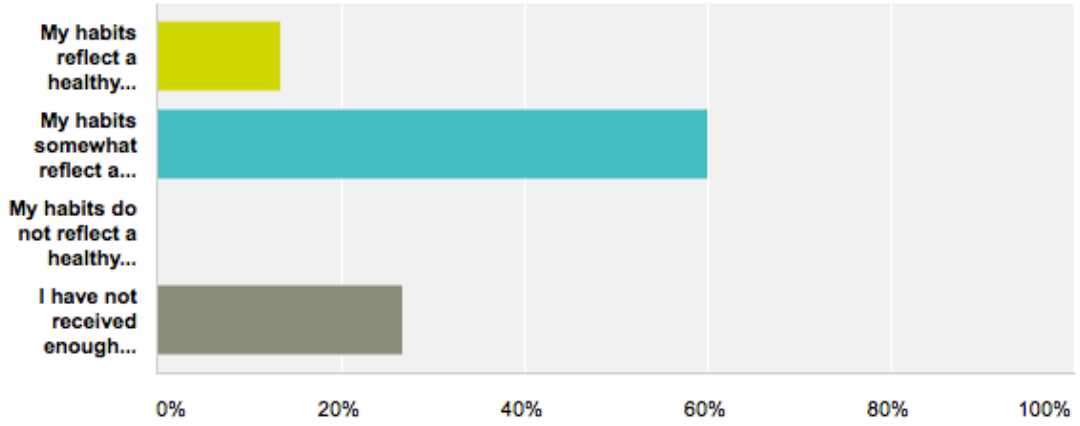


Answer Choices	Responses
1-3 servings	93.33% 14
4-6 servings	6.67% 1
More than 6 servings	0% 0

Total Respondents: 15

How would you rate your grocery shopping habits based on the diabetic education you have received in the past?

- Answered: 15
- Skipped: 2



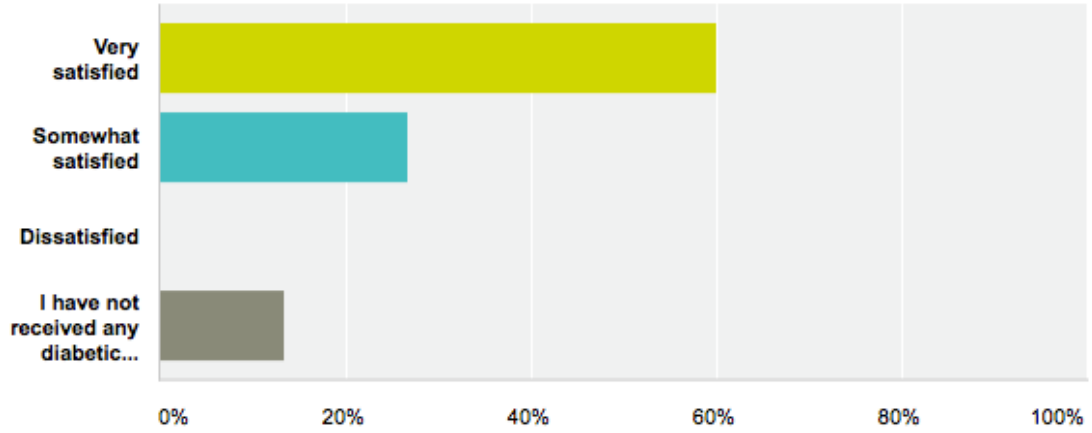
Answer Choices	Responses
My habits reflect a healthy diabetic friendly diet.	13.33% 2
My habits somewhat reflect a healthy diabetic friendly diet.	60% 9
My habits do not reflect a healthy diabetic friendly diet.	0% 0

Answer Choices	Responses
I have not received enough diabetic education.	26.67% 4

Total Respondents: 15

Overall, how satisfied have you been with you diabetic education resources?

- Answered: 15
- Skipped: 2



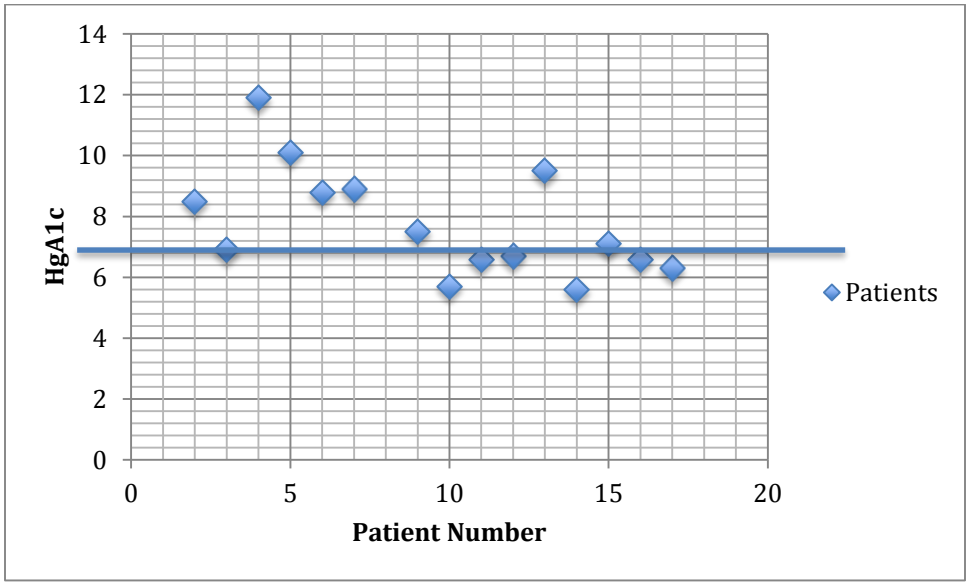
Answer Choices	Responses
Very satisfied	60% 9
Somewhat satisfied	26.67% 4
Dissatisfied	0% 0
I have not received any diabetic education resources	13.33% 2

Total Respondents: 15

Surveymonkey.com

Appendix G

Hemoglobin A1c Levels of the Jackson-Hinds Surveyed Patients



Target HbA1c levels

Appendix H

Cost of the "Diabetic Friendly Grocery List" at Wal-Mart for a family of four for one month.

Produce	Cost
Apples	3.97
⊡ Strawberries	2.18
⊡ Blackberries	2.98
⊡ Blueberries	4.98
⊡ Pears	1.57
⊡ Bananas	1.08
⊡ Grapes	1.98
⊡ Small oranges	4.88
⊡ Grapefruit	0.82
⊡ Lemons	2.87
⊡ Brussels sprouts	2.98

⊡ Carrots	2.98
⊡ Celery	1.68
⊡ Cauliflower	2.78
⊡ Green onions or scallions	1.1
⊡ Onions	2.46
⊡ Garlic	3.88
⊡ Peppers (bell, jalapenos)	2.8
⊡ Squash (summer, zucchini)	1.38
⊡ Tomatoes	1.78
⊡ Lettuce	1.28
⊡ Cilantro	0.74
⊡ Green beans	1.96
⊡ Mushrooms	1.78
⊡ Asparagus	2.88

	Total	59.77
Deli		
⊡ Turkey (low sodium)		2.98
⊡ Turkey bacon		2.28
⊡ Cheese (reduced-fat)		2.48
⊡ Shredded reduced-fat cheese		4.48
⊡ Feta cheese		1.58
⊡ Parmesan cheese (grated)		2.68
	Total	16.48
Meats		
⊡ Fish fillets (fresh or frozen: catfish, tilapia)		18.46
⊡ Shellfish (shrimp)		5
⊡ Frozen chicken breast (boneless, skinless)		6.98
⊡ Steaks (sirloin)		12.5

⊡ Ground meat (turkey)		5.96
	Total	48.9

Dairy

⊡ Milk (skim or 1%)		4.66
⊡ Yogurt (non-fat or low-fat)		1.88
⊡ Cottage cheese (low-fat)		1.88
⊡ Margarine (trans-free)		1.36
⊡ Eggs (or egg substitute)		1.38
⊡ Sour Cream (fat-free)		1.48
⊡ Cream cheese (fat-free)		1.98
	Total	14.62

Baked Goods

⊡ 100% whole wheat bread		2.48
⊡ 100% whole wheat pita bread		1.24

⊡ Whole wheat crackers	2.5
Total	6.22

Non-perishables, etc.

⊡ Canned vegetables (green chilies)	0.88
⊡ Canned fruit (Canned in juice: mandarin oranges, peaches, pears, pineapple, tomatoes)	1.66
⊡ Canned beans (low-sodium: black, kidney, green)	0.68
⊡ Canned salmon or tuna (canned in water or oil)	2.22
⊡ Instant oatmeal or quick oats	1.64
⊡ Quick cooking grits	1.48
⊡ Cereal (whole grain)	2.58
⊡ Pasta (whole wheat)	1
⊡ Brown rice	1.48
⊡ Dried fruit (cranberries, mixed fruit, raisins, tomatoes)	1.98

⊡ Nuts (almonds, peanuts, pecans, pistachios)		13.84
⊡ Peanut butter (trans fat-free: smooth or crunchy)		2.34
⊡ Seeds (sunflower)		2
⊡ Popcorn (light, microwave)		2.18
⊡ Spaghetti sauce		1
⊡ Tomato sauce		0.33
⊡ Soup (low-sodium versions) (chicken broth)		0.96
⊡ Mayonnaise (fat-free)		2.88
⊡ Mustard (Dijon)		1.5
⊡ Prepared salsa		1.98
⊡ Balsamic Vinaigrette		1.98
	Total	46.59

Spices

⊡ red wine vinegar

⊡ Whole wheat flour		3.63
⊡ Spices (apple pie spice, pepper, garlic powder, cinnamon, ground mustard, cumin, chili powder, curry powder, cayenne, paprika)		23.37
⊡ Dried herb or spice blends (salt-free)(oregano, parsley, basil, thyme)		5.18
⊡ Salt substitute		1.92
⊡ Sugar substitute		6.42
⊡ Cooking sprays		1.98
⊡ Vanilla extract		0.98
⊡ Canola Oil		2.08
⊡ Olive oil		4.36
	Total	49.92
	Complete Total	242.5

Appendix I

For More Information:

American Diabetes Association

www.diabetes.org/mfa-recipe

2013

Diabetic Friendly Recipes

Companion to Your Diabetic Friendly Grocery List

2013

DIABETIC FRIENDLY RECIPES

FAST SNACKS

Raisins and Seeds
- ⊡ 1 mini-box rasins
- ⊡ 2 tbsp seeds

Calories: 145; Carbohydrates: 14g
Source: Diabeticlivingonline.com

Apples and peanut butter
- ⊡ 1 small apple (cut into wedges)
- ⊡ 2 tbsp peanut butter

Calories: 105
Carbohydrates: 20 g
Source: Diabeticlivingonline.com

Cottage cheese and carrots
- ⊡ 1 cup raw carrot
- ⊡ 4 oz low fat cottage cheese

Calories: 125;
Carbohydrates: 14 g
Source: Diabeticlivingonline.com

Strawberries and yogurt
- ⊡ ¾ cup sliced strawberries
- ⊡ 6 oz nonfat yogurt

Calories: 140;
Carbohydrates: 16 g
Source: Diabeticlivingonline.com

Mini pizza
- ⊡ ½ 100% whole-wheat pita
- ⊡ ½ cup thinly sliced veggies
- ⊡ 1 tbsp spaghetti sauce
- ⊡ ½ cup shredded part-skim cheese

Assemble pizza and microwave about 30 seconds or until melted. Sprinkle with fresh basil or dried oregano, if desired.
Calories: 141;
Carbohydrates: 14 g
Source: Diabeticlivingonline.com

SOMETHING FOR THE SWEET TOOTH

Apple Crisp
- ⊡ 5 cups sliced peeled cooking apple
- ⊡ 2 tbsp equivalent sugar substitute
- ⊡ 1 tsp lemon juice
- ⊡ ½ tsp apple pie spice
- ⊡ ½ cup oats
- ⊡ ¼ cup equivalent sugar substitute
- ⊡ 3 tbsp whole wheat flour
- ⊡ ¼ tsp apple pie spice
- ⊡ 3 tbsp margarine

For filling: Preheat oven to 375 degrees F. In a large bowl combine apples, 2 tablespoons equivalent sugar substitute, lemon juice, and ½ teaspoon of the apple pie spice. Transfer apple mixture to a 2-quart square baking dish.For topping: In medium bowl, combine oats, ¼ cup equivalent sugar substitute, flour, and ¼ teaspoon apple pie spice. Cut in butter until mixture resembles coarse crumbs. Sprinkle topping over filling.Bake for 30 to 35
Calories: 142; Carbohydrates: 24 g

Dinner

30-minute chicken
1 medium onion, sliced
4 boneless/skinless 4 oz chicken breast halves
½ lb fresh mushrooms, sliced
2 medium zucchini, sliced
2 garlic cloves, minced
1 can (14-1/2 oz) diced tomatoes, undrained
¾ tsp dried basil
½ tsp dried oregano
In a greased 13 in x 9 in baking dish, place onion and chicken breast; sprinkle with pepper. Layer mushrooms and zucchini over chicken. Combine the garlic, tomatoes, basil and oregano; pour over vegetables.
Cover tightly. Bake at 450 deg for 30 minutes until juices run clear.
Yield: 4 servings
Calories: 212, Carbohydrates: 15 g; Source: Tasteofhome.com

Baked chicken and mushroom*
6 boneless skinless chicken breast halves (4 oz each)
¼ tsp paprika
½ lb fresh mushrooms, sliced
1 tbsp margarine
½ cup chicken both
3 green onions, chopped
1 garlic clove, minced
½ tsp equivalent salt substitute
1/8 tsp pepper
¾ cup shredded part-skim mozzarella cheese
Arrange chicken in a 13 in x 9 in baking dish coated with cooking spray. Sprinkle with paprika. Bake, uncovered, at 350 deg for 15 minutes. Meanwhile, in a large nonstick skillet, sauté mushrooms in butter for 5 minutes. Add the broth, green onions, garlic, salt and pepper. Bring to a boil. Pour over chicken.
Bake 10-15 minutes longer or until a meat thermometer reads 170 deg. Top with chees. Bake 3-5 minutes or until cheese is melted. Yield: 6
Calories: 198, Carbohydrates: 3 g; Source: Tasteofhome.com

Breakfast

Anytime frittata

- ⊡ 1 ¼ cup egg substitute
- ⊡ 2 eggs
- ⊡ ½ tsp dried oregano
- ⊡ 1/8 tsp pepper
- ⊡ 1 small onion, chopped
- ⊡ 1 garlic clove, minced
- ⊡ 1 tsp margarine
- ⊡ 3 plum tomatoes, chopped
- ⊡ ½ cup crumbled feta cheese

In a small bowl, whisk the egg substitute, eggs, oregano and pepper; set aside. In a 10 in. oven-proof skillet, sauté onion and garlic in butter for 2 minutes. Stir in tomatoes; heat through.
Pour reserved egg mixture into skillet. Reduce heat; cover and cook for 4-6 minutes or until nearly set.
Sprinkle with cheese. Broil 3-4 in from the heat for 2-3 minutes or until eggs are completely set. Let stand for 5 minutes. Cut into wedges. Yield: 4 servings
Calories: 138; Carbohydrates: 6 g
Source: Tasteofhome.com
Pictured Top Left with a side of blueberries.

Baked Eggs with Cheddar and Bacon

- ⊡ 4 eggs
- ⊡ 4 tbsp fat-free milk, divided
- ⊡ 2 tbsp shredded cheddar cheese
- ⊡ 2 tsp minced fresh parsley
- ⊡ ¼ tsp equivalent salt substitute
- ⊡ 1/8 tsp pepper
- ⊡ 2 turkey bacon strips

Preheat oven o 325 deg. Coat four 4 oz ramekins (cupcake tins work great, too) with cooking spry; break an egg into each dish. Spoon 1 tbsp milk over each egg.

Combine cheese, parsley, salt and pepper; sprinkle over tops. Bake, uncovered, 12-15 minutes or until whites are completely set and yolks begin to thicken but are not firm.
Meanwhile, in a small skillet, cook bacon over medium heat until crisp. Remove to paper towels to drain. Crumble bacon and sprinkle over eggs.
Yield: 4 servings
Calories: 107; Carbohydrate 1g
Source: Tasteofhome.com
Pictured on page 3 Center with a side of apple slices.

Baked Southern Grits

- ⊡ 4 cups water
- ⊡ 1 cup quick-cooking grits
- ⊡ 4 egg whites
- ⊡ 2 eggs
- ⊡ 1 ½ cups (6 oz) shredded reduced-fat cheddar cheese
- ⊡ ½ cup fat-free milk
- ⊡ 1-2 jalapeno peppers, seeded and chopped
- ⊡ ¼ tsp garlic powder
- ⊡ ¼ tsp equivalent salt substitute
- ⊡ ¼ tsp pepper
- ⊡ 4 green onions, chopped, divided

In large saucepan, bring water to a boil. Add grits; cook and stir over medium heat for 5 minutes or until thickened. Remove from the heat.

In a small bowl, whisk egg whites and eggs. Stir a smill amount of hot grits into eggs; return all to the pan, stirring constantly. Stir in the cheese, milk, jalapenos, garlic powder, salt, pepper and half of the onions.
Transfer to a 2 qt baking dish coated with cooking spray. Bake, uncovered, at 350 deg for 30-35 minutes or until golden brown. Sprinkle with remaining onions.
Yield: 8 servings.
Calories: 158, Carbohydrates: 17 g
Source: Tasteofhome.com
Pictured page 3 Top Right with a side of pineapple.

Lunch

Taco salad
½ cup prepared salsa
¼ cup reduced-fat sour cream
1 tsp canola oil
1 medium onion, chopped
3 cloves garlic, minced
1 lb ground turkey
2 large plum tomatoes, diced
1 14 oz can kidney beans, rinsed
2 tsp ground cumin
2 tsp chili powder
¼ cup chopped fresh

Green Bean Salad*
12 oz fresh green beans, trimmed
8 oz yellow and/or red cherry tomatoes, halved
½ small red onion, thinly sliced
Basil-tomato vinaigrette:
1/3 cup snipped fresh basil
3 tbsp red wine vinegar
2 tbsp snipped dried tomatoes

Combine salsa and sour cream in a large bowl.
Heat oil in a large nonstick skillet over medium heat. Add onion and garlic and cook, stirring often, until softened, about 2 minutes. Add turkey and cook, stirring often and crumbling with a wooden spoon, until cooked through, about 5 minutes. Add tomatoes, beans, cumin and chili powder; cook, stirring, until the tomatoes begin to break down, 2 to 3 minutes. Remove from the heat, stir in cilantro and ¼ cup of the salsa mixture.
Add lettuce to the remaining salsa mixture in the bowl; toss to coat. To serve, divide the lettuce among 4 plates, top with turkey mixture and sprinkle with cheese. Yields: 4 servings
Calories: 447; Carbohydrates: 27 g
Source: Diabeticconnect.com
Pictured to the left with a side of guacamole.

2 cloves garlic, minced
¼ tsp equivalent salt substitute
¼ tsp pepper
In a medium saucepan, cook green beans, covered, in a small amount of boiling lightly salted water about 8 minutes or just until crisp-tender. Drain; rinse with cold water and drain again.
In a large bowl, combine beans, cherry tomato halves, and red onion slices. Drizzle with Basil-tomato vinaigrette; toss gently to coat. Cover and chill before serving. Yields: 6 (3/4 cup) servings. Serve with half a whole wheat pita and 2 slices lean deli meat.
Calories: 53, Carbohydrates: 8
Source: Diabeticlivingonline.com
Pictured to the left as a side.
Also features Apple Crisp (recipe on pg 7)