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Nutritional Barriers for Patients with Diabetes: A quality improvement project

Emma C. Levine

Taylor D. Marquis

NUTRITIONAL BARRIERS FOR PATIENTS WITH DIABETES:
A QUALITY IMPROVEMENT PROJECT

Hinesburg Family Medicine

Emma Levine and Taylor Marquis

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Project Mentor: Michelle Cangiano

Problem Identification

- **8%** of Vermont adults have diabetes
  - **6%** of adults in Chittenden County
  - Among the **most** common chronic diseases in the state

- Prevalence **increases** with advancing age & **decreases** with socioeconomic status

- Prevalence is similar between white, non-Hispanic adults (**8%**) and adults of a racial or ethnic minority **(9%)**

- **46%** of adults with diabetes said they had attended diabetes self-management education.
  - Below the Healthy Vermonters 2020 **target of 60%.**

Public Health Cost

- Compared to those without diabetes, VT adults with diabetes are...
  - More than **2x more likely** to be diagnosed with obesity, arthritis, cancer, and COPD
  - More than **4x more likely** to be diagnosed with cardiovascular disease
  - More than **5x more likely** to be diagnosed with chronic kidney disease

- Diabetes-related mortality rate is **on the rise** in VT
  - 123.2 in 2019, up from 99.9 in 2009 (per 100,000)

- Total direct diabetes-related medical expenses were estimated at **$409 million** in Vermont in 2012
  - Indirect costs due to lost productivity totaled **$134 million**

- **1 in 7** healthcare dollars is spent treating diabetes and its complications, nationwide.

Provider's Prospective on Nutritional Barriers For Patients with Diabetes

- We asked the providers at Hinesburg Family medicine the following questions:

1. Do patients with diabetes have a good understanding of nutrition in a way that it impacts their diabetes?
    - "No and many patients aren't willing to accept nutrition referrals"
    - "No"
    - "Depends on the patient. The vast majority do not."
    - "Some do, particularly patients who were diagnosed a long time ago."

2. If you had to guess, how many of your patients have met with a nutritionist multiple times?
    - "10%"
    - "10% - a lot of people are too confident in their knowledge. The nutritionists also don't meet people where they are at."
    - "Very small percentage – some decline a referral right away, some make an appointment and don't attend, some go to one appointment, etc."
    - "Not very many."

3. What are the biggest barriers to eating the foods that may help decrease their A1c?
    - "Patient's like they way they are eating and don't want to make the change."
    - "Knowledge"
    - "Large portion is financial they can't afford the fresh fruits and vegetables. Knowledge is the second biggest barrier."
    - "Convenience. Habit. Lifestyle."

Intervention + Methodology

- We surveyed **10 patients** on the following:
  - Have you met with a **nutritionist**? A **diabetes nurse educator**? If so, how many times?
  - A list of various foods, and whether patients believed each **impacted** blood glucose (BG)
  - Are there **barriers** that prevent you from eating the foods that help control your blood glucose/sugar? If so, what are those barriers?
  - Providers wrote down patient's **last A1c** on survey

- Meeting with Rachel Kring, Executive Director of the Hinesburg Community Resource Center
  - Provided Center with Notecard that includes **lower-carb alternatives** to favorite foods, which we identified

Survey Results

- **70%** of the patients had *Type II diabetes*
- **60%** had seen a *nutritionist*
- **40%** had seen a *diabetes nurse educator*
- **60%** correctly identified that *carbohydrates* are the most important thing to look at on a nutrition lab when weighing impact on BG
- Only **30%** of patients thought there was a nutritional barrier to controlling their BG
  - (Of those **0%** said there was a financial OR education barrier)
- **40%** of patients had an A1c ≥7

- Do these foods impact BG?
  - Pasta (yes) - 90% answered correctly
  - Meat (no) - 90% answered correctly
  - **Bananas (yes) - 50% answered correctly**
  - Rice (yes) - 80% answered correctly
  - Celery (no) - 100% answered correctly
  - Potatoes (yes) - 90% answered correctly
  - **Cheese (no) - 60% answered correctly**
  - Regular soda (yes) - 100% answered correctly
  - **Diet soda (no) - 40% answered correctly**

- On average, patients who have *met with a nutritionist* answered **80% correctly**, while those who have not met with a nutritionist answered **67% correctly**.
- On average, patients with an *A1c ≥7* answered **83% correctly**, while those with an A1c <7 answered **69% correctly**.

Response: Community Engagement

- Hinesburg Community Resource Center, (aka **Hinesburg Food Shelf**):
  - Will add educational information to their newsletters about "carb smart" options
  - Further measures may be implemented when community members can shop, again
    - Providing alternatives to high carb foods at the HCRC

- Notecard / educational handout
  - To be provided to patients and/ or customers at HCRC

Nutrition Facts

3 servings per container

Serving size	(75g)

Amount Per Serving

Calories   **20**

	% Daily Value*
Total Fat 0g	0%
Saturated Fat 0g	0%
Trans Fat 0g	
Sodium 140mg	6%
Total Carbohydrate 4g	1%
Dietary Fiber 2g	7%
Total Sugars 0g	
Includes 0g Added Sugars	0%
Protein 2g	4%

Not a significant source of cholesterol, vitamin D, calcium, iron, and potassium

*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

Net Carbs = Total Carbohydrates – Dietary Fiber

Two important things to look at: **Total Carbohydrates** and **Dietary Fiber**

ALTERNATIVES FOR HIGH CARB FOODS

- Pasta (Barilla thin spaghetti – 39 carbs per 1 cup) → **Alternative options**:
  - Barilla Whole Grain thin spaghetti (32 carbs per 1 cup)
  - Barilla Protein + thin spaghetti (33 carbs per 1 cup)
  - Zucchini noodles (5 carbs per cup) or Spaghetti Squash (7 carbs per cup)
- Mission Tortilla (26 carbs for 1 tortilla) → **Alternative options**:
  - Mission carb balance (4 carbs for 1 tortilla)
- Bagel and bread **Alternative options**:
  - Bagel Thins (21 carbs for 1 bagel)
  - Sandwich Thins (25 carbs for 1 thin)
- Orange Juice (26 carbs for 8 oz) → **Alternative options**:
  - Trop50 (13 carbs for 8 oz)
- Ice cream bar **Alternative options**:
  - Kind Frozen (9 carbs for 1 bar)
- Other **low carb foods** to consider: Meat (fish, chicken, steak), Cheese, Vegetables (cucumbers, carrots, lettuce), Fruits (blackberries, blueberries, raspberries)

Evaluation of Effectiveness and Limitations

- **Limitations**
  - Small sample size (10 patients completed the survey)
  - Association between A1c and nutritional knowledge may be impacted by **confounding variables** (medication management, exercise, time since diagnosis, etc.)
  - It was unexpected that patients with **higher A1c's** scored higher (**more correct answers**) on the food quiz
    - Have these patients received more diabetes and nutrition education because their diabetes is not as well-controlled?

- Other things to consider:
  - A1c aside, does diabetes education result in **clinically significant** outcomes?
    - Fewer amputations? Longer life expectancy?
  - What is the **role of language** when encouraging lower carb choices for people with diabetes?
    - "Low-sugar" vs "low-carb"
    - Bananas as an example of a high carb (~30g) fresh fruit

Future Interventions / Projects

- **Increasing** sample size, power
  - Discuss project with future students, who can survey more patients
  - Use results to draw stronger conclusions and associations

- Hinesburg Family Medicine
  - Working to **improve** patient diabetes education with data-driven strategies
  - Working to **bridge knowledge gaps** between patients and providers

- Hinesburg Community Resource Center
  - Offering **"Carb Smart Options"** for customers
  - Continuing to offer nutrition educational notecards

References

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Interview Consent

Thank you for agreeing to be interviewed. This project is a requirement for the Family Medicine clerkship. It will be stored on the Dana Library ScholarWorks website. Your name will be attached to your interview and you may be cited directly or indirectly in subsequent unpublished or published work. The interviewer affirms that he/she has explained the nature and purpose of this project. The interviewee affirms that he/she has consented to this interview.