

University of Vermont

UVM ScholarWorks

Family Medicine Clerkship Student Projects

Family Medicine Community

2021

Lifestyle Changes in Diabetes Management using Smartphone apps

Michelle Oberding

Larner College of Medicine

Follow this and additional works at: <https://scholarworks.uvm.edu/fmclerk>



Part of the [Medical Education Commons](#), and the [Primary Care Commons](#)

Recommended Citation

Oberding, Michelle, "Lifestyle Changes in Diabetes Management using Smartphone apps" (2021). *Family Medicine Clerkship Student Projects*. 689.

<https://scholarworks.uvm.edu/fmclerk/689>

This Book is brought to you for free and open access by the Family Medicine Community at UVM ScholarWorks. It has been accepted for inclusion in Family Medicine Clerkship Student Projects by an authorized administrator of UVM ScholarWorks. For more information, please contact donna.omalley@uvm.edu.



Lifestyle Changes in Diabetes Management using Smartphone apps

South Burlington Family Medicine

Michelle Oberding

March 2021

Project mentors: Katherine Mariani MD, Whitney Calkins MD



Problem Identification- Diabetes in VT

- ▶ 8.4 % of adults diagnosed with diabetes
- ▶ 14,000 people have undiagnosed diabetes
- ▶ 33.6 % adults have prediabetes ⁵

- ▶ Poor glycemic control (measured by A1c) in diabetes leads to microvascular complications of disease (diabetic retinopathy, nephropathy, neuropathy) ³

- ▶ Diet, exercise, medical compatibility result in better A1c ²
- ▶ Decreasing A1c through lifestyle changes is a key role in treatment

- ▶ The following components of an effective program ¹ could be targeted with smartphone apps:
 - ▶ Defined weight loss and physical activity goals
 - ▶ Ongoing intervention
 - ▶ Flexible maintenance program
 - ▶ Continual feedback

Public Health Cost

National spending data

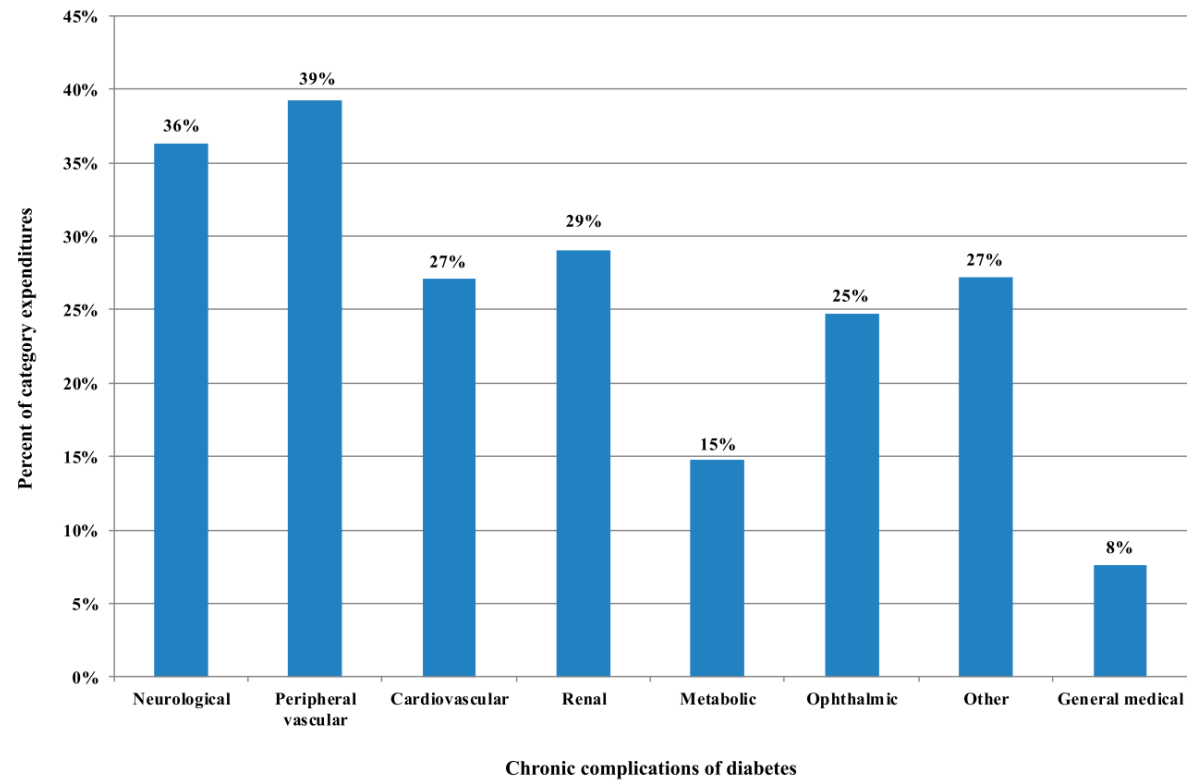


Figure 1—Percent of medical condition-specific expenditures associated with diabetes. Data sources: NIS (2014), CMS MDS (2013), NAMCS (2013–2015), NHAMCS (2012–2014), MEPS (2011–2015), NHHCS (2007), NHIS (2014–2016), OptumInsight dNHI (2015), and Medicare 5% SAFs (2014). See Supplementary Appendix 2 for diagnosis codes for each category of medical condition.

VT statistics ⁴

➤ \$520 million yearly

➤ Direct medical expenses (2017):
\$360 million

➤ Indirect costs (2017) : \$160 million

Community Perspective

Benjamin Clements- MD

- Medications and lifestyle change most important
- Motivational interviewing valuable- hard to find motivation for change without ability to identify a problem oneself
- Ask patients- what are you doing well? What could you improve?

Amy Sercel- nutritionist

- Stressors may trigger blood sugar abnormalities
- Importance of ongoing support, setting realistic goals, making small changes, working with foods they already enjoy
- Intuitive eating to sense hunger and wellness cues to keep blood sugars in a more even window

Chassidy Deslauriers- diabetes educator

- Barriers include skills of food prep, planning meals and organizing thoughts
- Without a plan people revert to old food habits
- People respond well to recipe videos
- Those who don't enjoy exercise may benefit from little spurts of reminders throughout the day
- Struggling with taking medications- reminders on phone, bubble packs, taking medication at same time as preestablished habit like making coffee
- Stress management is important



Intervention and Methodology

Goal

- ▶ Help promote continuous and lasting lifestyle changes with the use of free smartphone apps
 - ▶ Daily medication reminders
 - ▶ Exercise monitoring
 - ▶ Diet goals and diabetes healthy meals
 - ▶ Stress management through yoga and meditation

Intervention

- ▶ Provide resource with free smartphone app suggestions to patients with diabetes and prediabetes to help aid in a holistic approach to disease management
- ▶ Create a dot phrase that is available in Epic for all to use, could easily be added to after visit summaries (.DIABETESAPPS)

Free Smartphone Apps to Help with Lifestyle Changes in Diabetes Management



Pill reminder and Med Tracker

- Enter medications and receive phone alerts when it's time to take medication
- Can add "as needed" medications to track trends
- Refill reminders – can add doctor who prescribes the medication
- Can review calendar
- Can enter photo of medication



Diabetic Recipes: Healthy Foods

- Provides diabetic friendly recipes for main dishes, salads, soups, smoothies and desserts
- Easy to follow step-by-step instructions
- Create grocery list on the app
- "Food store" – select which ingredients you want to use, and the app provides recipes
- "Food shot"- take a picture of food and it will give recipes using that ingredient
- Can add recipes to "Favorites"



Type 2 Diabetes lifestyle and BG by Nourishly

- Offers weekly meal plans (all meals and snacks!)
- Easy to follow recipes with pictures
- Track meals and snacks- option to use photo diary to snapshot plate
- Tracks mood and thoughts in relation to meals
- Integrates mindfulness surrounding food consumption



Map my run

- Use GPS to track your walk lengths, speed and elevation gain!
- Select from walking, running, hiking, biking, etc.
- Add friends to share progress
- Sends email with weekly report (if desired)



Simply Yoga

- Select from classic routines and streaming videos
- Select duration and level – great for beginners and those wanting to advance practice



My fitness pal

- Select goals
- Enter food and water consumed that day and exercise- calculates daily calorie goals
- Tracks weight and monitors progress
- Provides some recipes from the blog



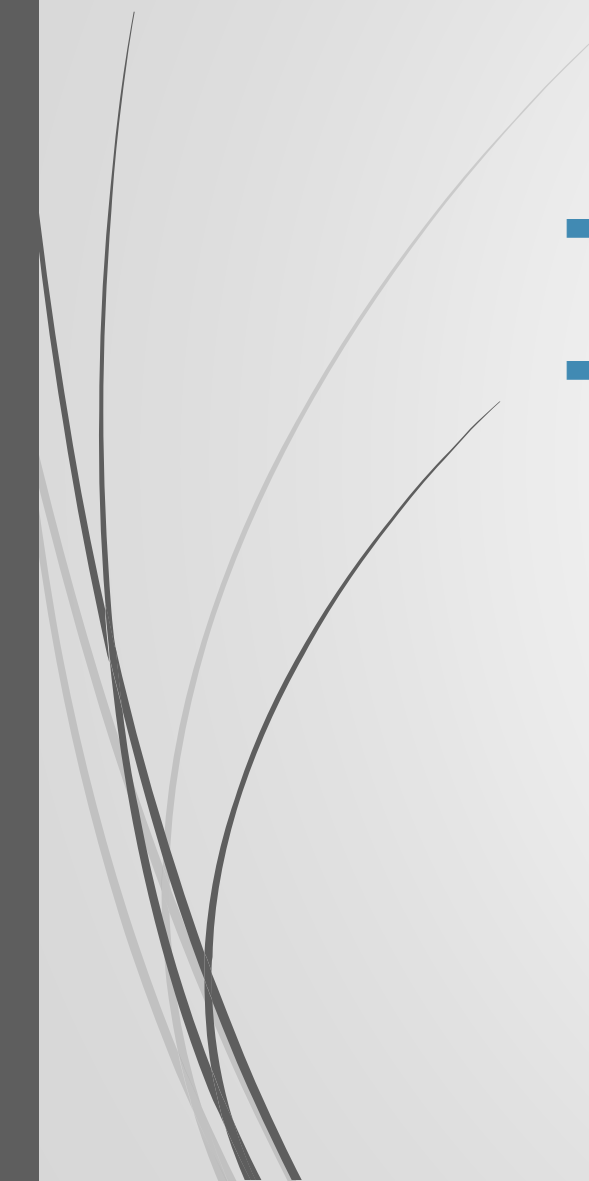
Insight Timer


- Guided meditation app
- Courses for learning, anxiety, sleep, mindfulness at work, stress, self-esteem

These apps are free- some may have options to purchase further resources. This is meant to be a suggestion for helpful apps, not as an advertisement or endorsement for any of the above apps. I hope you enjoy!



Results and Response- future steps

- ▶ Qualitative responses to using the apps and how they affected patient health
 - ▶ Quantitative comparison of A1c of patients who regularly use smartphone apps for lifestyle changes related to their disease vs those who do not use apps.
- 



Evaluation of effectiveness and limitations

- ▶ Monitor Hemoglobin A1c as recommended for routine care
- ▶ Survey patients who have been provided the resource
- ▶ Limitations
 - ▶ Access to smartphones
 - ▶ Ease of technology use
 - ▶ Resources are mostly in English



Recommendations for future intervention

- ▶ Create survey to receive feedback from patients who have used the apps
 - ▶ Which apps used?
 - ▶ How often?
 - ▶ Individual perspective on utility?
- ▶ Modify smartphone app recommendations based on patient feedback



References

1. Diabetes Prevention Program (DPP) Research Group. The Diabetes Prevention Program (DPP): description of lifestyle intervention. *Diabetes Care*. 2002;25(12):2165-2171. doi:10.2337/diacare.25.12.2165
2. Relationship between the poor glycemic control and risk factors, life style and complications Biomedical Research (2017) Volume 28, Issue 4 ISSN: 0970-938X (Print) | 0976-1683 (Electronic)
3. Microvascular and Macrovascular Complications of Diabetes Michael J. Fowler, MD. *Clinical Diabetes* 2008 Apr; 26(2): 77-82. <https://doi.org/10.2337/diaclin.26.2.77>
4. Economic Costs of Diabetes in the U.S. in 2017 <https://doi.org/10.2337/dci18-0007>
5. The Burden of Diabetes in Vermont. American Diabetes association