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Patient-Oriented Smartphone Apps to Improve Health & Wellbeing

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Hinesburg Family Medicine, Hinesburg, VT

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Class of 2019, Larner College of Medicine at the University of Vermont

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Project Mentor: Michelle Cangiano, MD

Problem & Need

- Patients have the ability to improve their health outcomes, but their capacity to do so is sometimes underutilized due to misunderstanding of how to care for themselves or ineffective engagement in their health. Technologies such as smartphone apps may improve patients' abilities to manage their chronic diseases.[5]
- Over 75% of Americans own a smartphone, and the use of health-related apps has doubled, particularly in patients with chronic illnesses.[6] Apps allow patients to track disease-associated metrics such as blood pressure or blood sugar, which has been shown to increase engagement in self-care and improve clinical outcomes.[5] There is also promising data suggesting that smartphone apps that provide educational readings, a pain diary, or other cognitive behavioral activities may help to reduce the use of opioids in pain management.[4]
- Some patients are willing to use technology such as smartphone apps to their advantage, but providers are often unsure as to how to advise their patients on the use of an app without firsthand knowledge or sufficient evidence on which to base a recommendation.
- At this time, there is no identified strategy that providers can use to evaluate and recommend apps to patients. There are many apps available to consumers, but a high rating in the app store isn't necessarily indicative of an app's clinical utility. Few literature reviews have been conducted at this time on patient-oriented apps, with the exception of a 2016 study by Singh, et. al. that reviewed 137 apps from the Apple and Google Play stores.[8]

Cost Considerations

- Chronic diseases are the leading cause of death in Vermont, with 76% of deaths attributed to a chronic illness. It is estimated that chronic disease will cost Vermont more than $2 billion in health care costs this year alone. It is believed that 3 behaviors (a sedentary lifestyle, tobacco use, and inadequate nutrition) cause 4 chronic diseases (cardiovascular disease, diabetes, cancer, and lung disease), which lead to the deaths of over 50% of the population.[3]
  - If we can assist our patients in making lifestyle modifications or in more effectively managing their chronic diseases, we may be able to reduce the health care costs that Vermont faces.
- It may take extra time and effort on a provider's part, but implementing the use of a smartphone app to improve a patient's management of their chronic disease or ability to implement lifestyle changes could have a significant impact on morbidity and health care costs in the state of Vermont and throughout the country.
  - The majority of the apps reviewed in this project are free to download from their respective app stores, so the use of this technology would not place increased financial burden on patients.

Community Perspectives

- Dr. Jim Ulager, Family Physician at Hinesburg Family Medicine
  - He has had several patients ask him for recommendations for smartphone apps that they can use to track things such as blood pressure readings, exercise, and stress relief/meditation.
  - He recently attended a conference for the American Medical Group Management Association and saw multiple presentations for health-related smartphone apps.
  - He believes that recommending an app to a patient would improve health if it solved a problem.
- Mr. Nicholas Reed, patient
  - Would only use a health-related smartphone app if he absolutely needed it.
  - He currently uses "The Color Line" app in lieu of calling in to determine when to show up for urine drug screens in Burlington. He states that it is significantly more convenient to use the app than it is to call.
- Ms. Amy Kemp, patient
  - Would use a smartphone app if it were recommended by her physician .
  - She is most interested in apps for stress relief and an app that would help her to track her seizure disorder (i.e. when she has seizures and what kind they are) in order to be able to properly report the information to her physician.

Intervention & Methodology

- I compiled a list of apps from the Apple and Android app stores that were recommended in the appendix of Singh, et. al. 2016,[8] as well as some that were already being recommended in practice at Hinesburg, and a few that were personally recommended.
  - I separated them into categories based upon the chronic illness or lifestyle modification that each app targeted. I made note as to whether the app was only available on an iOS platform[1] or an Android platform. [2]
  - I made sure that those apps are still in use and consistently updated today. I also tried to avoid apps that cost any money to download.
  - I chose categories of apps that would be most applicable to the types of patients seen at Hinesburg Family Medicine. I chose any additional apps based upon app store reviews, personal experience, and a handful of apps that are already recommended in Hinesburg.
- The patients who may benefit the most are those who love technology and who need extra assistance in managing their chronic illnesses or who would like help making lifestyle modifications.

Results & Response

- I gave a brief presentation on these apps to the providers and staff at Hinesburg Family Medicine, complete with links to each app.
  - My goal was to educate the providers as to the immense technological resources that are available to help us improve patient care and chronic disease management.
  - I briefly reviewed the 1-3 apps that I compiled for each of 17 chronic illnesses or lifestyle modifications.
  - I shared my presentation via email to the providers and staff at Hinesburg for future reference.
- I collected verbal feedback after my presentation from those who attended:
  - "Thank you. Now I know which apps to look at to personally validate them before recommending to my patients. There are just so many that I don't have time to examine all of them."
  - "The use of MyHealth Online and it's related app is becoming really big. I think patients want to start utilizing more technology in their care."
  - "Sometimes it is actually the elderly population who will get really excited about and use apps. They all have iPads!"

Evaluation of Effectiveness & Limitations

- Evaluation of effectiveness would likely include surveying providers at Hinesburg Family Medicine to see if they have been able to utilize my research and to make new app recommendations to patients. I would also like to know whether they believe this intervention has been useful to their practice.
- I would also like to survey patients to whom theses apps were recommended in order to find out whether they found the use of the technology helpful for managing their illnesses.
- Limitations of this project:
  - My own research was limited due to the dearth of literature reviews of patient-oriented apps.[7] There are innumerable smartphone apps that exist, and new ones are produced every day, but it is difficult to keep up with the evolving technology. Perhaps with time and as providers further recognize the value of technology in patient care, more research will be conducted on the use of apps by patients.
  - Another important limitation is whether or not providers are open to recommending technology that they don't know well. Some providers may not be open to endorsing apps to their patients, even if they have been validated by a research group. Hopefully the physicians I provided information to will be able to a do a little of their own research on the apps and feel more comfortable recommending them as a valid tool for patients.

Recommendations for Future Interventions

- Future directions would likely include further literature reviews, as technology is constantly evolving. There are too many apps that exist for all to be reviewed in this project. It would be useful to identify apps that are better than those that I discovered or new apps that may further contribute to patient care. I am hopeful that more research will be done in the near future on the clinical utility of a greater number of the apps that are available to consumers.
- Another direction could involve reaching out to other offices to see if providers at different locations routinely recommend smartphone apps to their patients. It would be interesting to learn whether apps are utilized either successfully or unsuccessfully in other practices in Vermont, or even elsewhere in the country.

References

1. **Apple App Store** [https://itunes.apple.com/us/genre/ios/id36?mt=8]

2. **Google Play Store** [https://play.google.com/store/apps?hl=en]

3. **Vermont Department of Health: 3-4-50 Vermont.** [http://www.healthvermont.gov/3-4-50/data-behavior-and-chronic-disease]

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5. Milani RV, Bober RM, Lavie CJ: **The Role of Technology in Chronic Disease Care**. *Prog Cardiovasc Dis* 2016, **58**(6):579-583.

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8. Singh K, Drouin K, Newmark LP, Lee J, Faxvaag A, Rozenblum R, Pabo EA, Landman A, Klinger E, Bates DW: **Many Mobile Health Apps Target High-Need, High-Cost Populations, But Gaps Remain**. *Health Aff (Millwood)* 2016, **35**(12):2310-2318.

Interview Consent Forms

Patient-Oriented Smartphone Apps to Improve Health & Wellbeing

Interview Consent Form

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.

Yes __X__ / No _____

If not consenting as above: please add the interviewee names here for the department of Family Medicine information only.
Name: _____James Ulager, MD_____

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Yes __X__ / No _____

If not consenting as above: please add the interviewee names here for the department of Family Medicine information only.
Name: _____Mr. Nicholas Reed_____

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Yes __X__ / No _____

If not consenting as above: please add the interviewee names here for the department of Family Medicine information only.
Name: _____Ms. Amy Kemp_____