

Capstone for Impact Submission | GY2020

Project Title: Patient Education Initiative for Patients with Cardiovascular Disease

Student Name(s): Veena Janardan

Advisor Names(s): Dr. Melvyn Rubenfire, Dr. Susan Hughes

Branch: SHBC

If this project can be continued by another UMMS student, please include your contact information or any other details you would like to share here:

Still discussing but potentially will be continued by Daniel Rizk, MS1

Summary: During my internal medicine core rotation, I had patients outwardly expressed confusion and desire to understand their diseases better, particularly heart failure patients. I saw a potential solution to this problem in creating a patient education seminar series for patients with cardiovascular disease through the Cardiac Rehab program at Domino Farms and the Cardiovascular Support Group led by Leah Brock at the Frankel Cardiovascular Center. I chose four topics to present on at each site during May 2019-December 2019. To demonstrate the benefits of my seminars, I had patients take a pre-seminar test and post-seminar test with the same questions and calculated the percent improvement in the scores. My goal was to improve test scores from before to after the seminar by at least 50% at each seminar and this goal was achieved. I also found that the change in test scores was significantly different ($p < 0.0001$) and there was not a significant difference between the improvement in scores across different seminar topics.

To provide background on the Cardiac Rehab program at Domino Farms: Following a major cardiac event, Michigan Medicine patients with appropriate indications can enter Phase II Cardiac Rehab, a 12 week (2 or 3 days/week) at Domino Farms during which they work with exercise physiologists and have educational experiences. Those that complete Phase II can choose to enroll in Phase III which is supervised outpatient exercise therapy. This project was initially aimed at Phase III patients as they do not have frequent educational seminars, and they have may have forgotten information presented during Phase II.

Methodology: The following seminar topics were chosen based on common cardiovascular diseases and seminar attendee preference: heart failure, coronary artery disease, hypertension, and arrhythmias. Lecture objectives, outlines, and PowerPoint slides were then made for each topic. heart physiology, pathophysiology, risk factors/causes, common lab tests, medications and procedures, and recommended lifestyle interventions associated with each disease using the latest AHA/ACC guidelines.

Initially seminars were intended to be given solely to Phase III cardiac rehab patients. However due to poor attendance, the seminar invitations were extended to Phase II and Phase III cardiac rehab patients at Domino Farms and patients who attended the cardiovascular support groups at the Frankel Cardiovascular Center. Four seminars were given at each site during May 2019-November 2019.

A 10 question multiple-choice test was developed for each topic, and questions mostly pertained to lifestyle interventions. The test was administered just before and after the thirty-fourty minute seminars and remained anonymous. Pre-seminar and post-seminar test data was analyzed via paired-t tests and the difference between the improvement of pre-seminar and post-seminar test scores among different seminar topics was analyzed using a one-way ANOVA.

Results: Among both sites, test data was obtained from a total of 10 patients for the heart failure seminar, 12 patients for the coronary artery disease seminar, 11 patients for the hypertension seminar, and 16 patients for the arrhythmias seminar. Some patients did attend multiple seminars. There was a significant improvement in scores from pre-seminar to post-seminar tests for all four seminar topics ($p < 0.0001$). The average improvement from pre-seminar test scores to post-seminar tests scores was 54.2%, 71.9%, 100%, and 57.0% for the heart failure, coronary artery disease, hypertension, and arrhythmia seminars, respectively. The difference between the amount of improvement in test scores across all four seminar topics was not found to be significant ($p = 0.20281$).

Conclusion: Overall, patients who attended these seminars showed a significant improvement from their pre-seminar test scores to post-seminar test scores. I also met my goal of improving test scores from before to after the seminar by at least 50% for each seminar. There was also no significant difference between improvement in scores among different seminar topic indicating that each chosen seminar topic had an equal impact in increasing patient scores. One limitation of this project is that testing patients immediately after the seminar tests only their recall, and not knowledge, which is more appropriate to test one week after a seminar is given. Unfortunately, that was not able to be completed here but is a possible future direction for the project. Another limitation of this project was not being able to account for variation in patients' memory and prior knowledge, as well as test difficulty for each topic.

Next Steps:

- Continue creating new seminars on cardiovascular topics (hyperlipidemia, valvular disease, etc).
- Assess improvement in patient knowledge after attending these seminars by administering post-seminar tests one week after the seminar.
- Make the PowerPoints accessible to all University of Michigan patients online; will have a general cardiology attending validate the PowerPoints.
- Create an elective class for M3s/M4s (branch students) to continue these seminars in other fields of medicine and attend weekly lectures on patient education.

Reflection/Impact Statement:

You may use the following questions to guide your reflection:

1. How did the process of conducting this research confront any limitations of your prior thinking?
2. Who could potentially benefit from this CFI project over different timescales and how?
3. What actions will you take afterwards to continue the momentum of this project, and maximise the likelihood of the identified benefits being achieved?
4. What advice would you give to another student completing their CFI?

I started this project to help patients understand their cardiovascular disease better, and I think I underestimated how much of an impact a medical student can make. I had "regulars" attend my seminars and they noted that it was nice to hear why exactly we recommend certain medications or lifestyle interventions. I was also surprised by how interested they were in learning about pathophysiology and tests/procedures. Although, in the beginning I also underestimated how difficult it can be to advertise and recruit patients to attend seminars as there are many socioeconomic factors at play. Thankfully, I was able to start my seminars at more than one location to get a better sample and teach more patients. I could answer most of their questions confidently and was able to find the answers for them if I did not know them. As a student, I have the time to go through most of the key information with them that they may have forgotten earlier or did not have time to discuss in the office with their cardiologists.

The people that will benefit most from my CFI project are the patients. I intend to recruit more medical students for this project and build a patient education course. This will not only benefit the students as they learn from these experiences and how to teach, but also benefit their future patients in all fields of medicine

as they will learn from the students. I also want to make my material accessible online so that patients can have access to this information put in layman's terms at any point, not just during my thirty minute seminars.

The advice I would give to another student completing their CFI is that with the number of mentors available and connections people have at the University of Michigan, all you need is a great idea and someone will help make it happen for you. It may not turn out to be the exact picture you had but if you show passion in a project your mentors will reach out and help you go through the process.