Experiences of Pre-Heart Transplant Patients Using Fitbit as an Ambulation Measuring Device

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Disclosure:

- Funding for the project was provided by the 2016 Brown Foundation Nursing Innovation Award
• To explore the experiences of pre-heart transplant patients utilizing Fitbit as an ambulation measuring device.
• The prevalence of HF has increased from 5.7 million to 6.5 million among Americans aged 20 years and older. (2017 ACC, AHA, and HFSA),
• Chronic, debilitating disease that often progresses to end-stage quickly when severe ventricular dysfunction leads to alterations in organ perfusion even at rest.
• Initially treated with guideline directed medical therapy
• Heart transplantation is the definitive treatment.
While waiting for transplantation, HF patients are typically medically managed with inotropic therapy and they are very prone to less than optimal mobility. Prolonged decreased activity results in severe widespread deconditioning affecting multiple organs and systems. Prolonged decreased activity results in profound loss of muscle strength and endurance of every muscle in the body. These patients may lose up to 15% of their muscle strength each week and almost half of their normal strength in three to five weeks (Dittmer, & Teasell, 1993). Complete immobilization will significantly increase a patient’s morbidity and mortality (H’Doubler et al., 2000).
• When medical treatment becomes ineffective, mechanical support is instituted. A percutaneously placed axillary intra-aortic balloon pump (IABP) enable the patient’s heart to be mechanically supported while waiting for heart transplantation. This procedure enables them to ambulate instead of being on bedrest with the traditional femoral IABP approach. (Estep, et al, 2013).
From a previous ambulatory IABP study, we identified the need for a better measuring device for ambulating pre heart transplant patients. (Macapagal, et al. 2017)

We theorized that patients will want to walk more/increase activity if they can see their progress thru the measuring device.

We theorized that simplifying the measuring process will improve nurses’ charting in the EMR of the distance ambulated by the patients.
Background:

How Far Did You Go?!?

A-Side ♦ to B-Side ♦: 90 ft.
Loop Around Unit: 270 ft.
Loop Around Unit & Cath Lab: 395 ft.

One-Way Calculations (add them up!):

A-Side ♦ - Elevators: 185 ft.
A-Side ♦ - Middle of Crosswalk: 275 ft.
A-Side ♦ - D10 Service Elevators ♦: 335 ft.
Large Loop Around D10E: 330 ft.
Loop Around D10 Elevators: 210 ft.
Large Loop Around D10W: 495 ft.

* - Diamond Shape Tile Design on Floor
An innovative approach using a Fitbit to accurately measure the number of steps the patient took during their ambulation process was implemented.

Experiences of these patients were explored using descriptive phenomenology to uncover the commonalities of the experience patients have using Fitbit as an ambulation measurement device.
Fitbit One:
• The Fitbit One Wireless Activity and Sleep Tracker tracks your physical activities and automatically syncs to your computer or smartphone to help you reach your fitness goals.
• Compatible with iPhone 4S or later, iPad (3rd Gen), Mac iOS, Android
• Dimensions: 1.89"H x 0.76"W x 0.38"D, 0.28 lbs.
• Push button control with each push cycles through one of six modes, steps, distance, calories burned, floors climbed, flower, v-lock
• Battery type: Lithium-ion polymer, battery life: 10 - 14 days
(Fitbit One product manual, 2017)
Research Design:

• Descriptive phenomenology was used in this study.
• Descriptive phenomenology uses direct exploration, analysis, and description of particular phenomena, free from unexamined presuppositions, with an aim of presenting intuition at its maximum (Speciale & Carpenter, 2007).
Scientific rigor is achieved by *bracketing*, a descriptive phenomenological technique to hold researcher’s latent ideas, preconceptions, and personal knowledge when listening on the lived experiences of the informants (Drew, 1999).
Methodology – Setting:

• This study was conducted in Cardiac Intensive Care unit where Class 1A HF patients were waiting for a heart transplant.
• The study participants: had either a Swan-Ganz catheter and ionotropic drips;
• an ambulatory axillary IABP
• doctors’ orders to ambulate.
Methodology - Interview Guide:

1. Tell me about your feelings when they gave you a Fitbit?
   a. Have you previously heard about Fitbit, or any other activity tracker?
   b. Do you know what the Fitbit is used for?
   c. Describe your reaction when the nurse provided you with the Fitbit?

2. What are some of your feelings when you walked using the Fitbit?
   a. Did you feel any changes in your body?
      i. (physical, emotional or other changes...)
   b. How is your sleep at night?

3. What kind of activities do you do with the Fitbit while in the hospital?

4. Tell me about your ability to be active at home before you were admitted to the hospital?
   a. Did you have a regular exercise routine at home, despite your heart failure?
   b. Did you use any activity tracker, such as Fitbit?
      i. If so... how was it working for you?

5. Why do you think it is important to be active even though you have heart failure?

6. What do you think of the Fitbit as a measuring device for walking?
   a. In your own words...what is the benefit of Fitbit to you?
Once informed consent was obtained, the study team scheduled a time for the participant’s interview at their convenience in their room. Two data collectors assisted with the interviews. The data collectors were trained on how to interview the participants.
Data Analysis - Colaizzi’s Method:

1. Interviews
2. Significant statements
3. Formulated meanings
4. Formulated meanings grouped on interview structure
5. Themes
6. Theme Clusters
7. Exhaustive description of phenomenon
8. Return to participants to validate the description
9. Incorporate new data to the exhaustive descriptive phenomenon
### Demographics:

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<td>Age, years</td>
<td>61.75±3.4</td>
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<tr>
<td>Gender</td>
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<td>BMI, kg/m²</td>
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<td>COPD, Pulm. HTN</td>
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<td>Heart Failure</td>
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<tr>
<td>(NYHA Class 3b-4)</td>
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<tr>
<td>Previous Heart Transplant</td>
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<td>Inotropes</td>
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<tr>
<td>Nasal cannula 1-4 L/min</td>
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<td>Patient Type</td>
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<td>IABP</td>
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<td>PA catheter</td>
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</table>
Patient Guidelines:

Patient Guidelines for the Fitbit Project:

1. Keep the Fitbit One charged by plugging into a USB port on a patient laptop/tablet or
desktop outside the patient room (ask your nurse). A fully charged Fitbit One last about
2 weeks, according to the manufacturer.

2. Wear the Fitbit One as soon as you get up, and keep wearing it until you go to bed at
night.

3. It tracks distance walked, steps, calories burned, stairs climbed, time and provides
motivational messages

4. Remind your nurse to chart the distance/steps walked in the nursing records.

5. This Fitbit is yours to keep, hopefully help you out with your rehabilitation and recovery
after you get a heart transplant. IF YOU LOSE THE FITBIT, IT CANNOT BE REPLACED.

6. Participation is voluntary; a private CICU pre-heart transplant Fitbit group has been
established where you can download and compare your data (calories burned, steps,
distance walked) with other CICU pre-heart transplant patients. You will be registered
only with your initials, your Fitbit number¹ and a nickname of your choice to maintain
your privacy. You can access this group anytime with a smartphone, tablet or
laptop/computer.

¹The Brown Foundation has generously provided funds for this project and request tracking the number of Fitsbits distributed.
Nurse Guidelines for the Fitbit Project

1. Make sure that the patient wears the Fitbit as soon as he/she gets up OOB.

2. Make sure that the Fitbit has enough battery charge before walking with the patient.

3. Chart the distance walked in Epic under Cares/Safety/Activity/Distance walked.

4. If patient does not have a device with USB port, please plug the Fitbit to the USB port of the nearest computer, for charging when the battery runs low.

5. This project is voluntary for the patient; they will be asked to register and join the Fitbit group “CICU Pre-Heart Transplant Group” with only their initials, a nickname of their choice and the device number, to maintain their privacy. They can upload their data into their group and see how they are doing compared to others, and hopefully motivate them to move/walk more. THE FITBIT IS THEIRS TO KEEP. LOST FITBITS CANNOT BE REPLACED.
Results:

The team identified:

• 361 significant statements
• 224 formulated meanings
• 17 themes
• 4 cluster of themes
Results Continued:

• Cluster of themes:
  – Happy/excited
  – Motivator
  – Beneficial
  – Future Potential
“I was excited about it, I never had one and I was really excited about it. It made me feel like I am accomplishing something. I felt pretty confident with myself with the Fitbit. I felt I had a challenge.”

“I know it’s a great tool in keeping up with your activity. I am glad to get it because I wanted to track my steps every day.”

“I was pretty happy to participate in the study to assess whether or not to exercise, if that is the case it will benefit people with a heart condition such as myself.”

“I was pleased to be a part of the study. I had a Fitbit at home but I stopped using it when my heart was failing. I didn’t exercise much, but now I enjoy it.”

“I felt like I won the lotto, I was happy and I said why not…”

“I was excited, with the purpose of how I could benefit from it.”

“It was good for motivation and get me to walk. I was happy and glad to participate.”
“It made me feel like I am accomplishing something. I felt pretty confident with myself with the Fitbit. I felt I had a challenge.”

“When I am walking with the Fitbit, I make sure that I couple the amount of steps that I take each day.”

“Emotionally I was reaching small goals from the first time being just to walk around the corridors to the last time I walk half a mile walking down various corridors.”

“I don’t even think about it...actually I think about it when I get back to the room and I press the button and yayyy I got a bunch of steps, I was happy about it. I know it’s counting my steps and the next day I want to count more step than the day before so it has value.”

“Fitbit doesn’t really change anything...I know how many steps I have done in one particular point, it allows me to push forward because what I want to do is achieve everyday a little bit further so the Fitbit gives me that information every day.”

“I mean I could hardly tell you got it on. Sleep better I guess. It was the walking that did it, I don’t think Fitbit had anything to do with it. It’s the walking itself that the Fitbit encouraged me to do. You know the walking help me to sleep better.”
“It made me feel like I was accomplishing something. I sleep pretty good considering that we are in the hospital.”

I started with 695 steps and I went to 895, you could look at the record and see it, but I’m up to my highest I think is 5000 steps, but I’m going to beat that today. This is a motivator you really want to take one more step than you did yesterday.”

I walk and also I have an exercise bike I use that. Any type of exercises. I have weights that I use periodically so I use that with any type of exercises that I do. I do strengthening exercises and whatever exercises I do in the room, I have the Fitbit on.

No it didn’t change my feelings about it body wise, emotional it did because this is something I wanted to find out. I sleep good at night.

You know the walking help me to sleep better, the walking itself that the Fitbit encouraged me to do.

I think that the exercise does help. It relieves some tension and stress, so I do think that it (Fitbit) helps.
“It is important because you want to have strength when you get your heart transplant. I think it will help my recovery 100%.”

“I think it’s important to have this Fitbit for tracking your steps every day and then it help motivate you to stay strong.”

“Because your other body parts contribute to the workout and endurance so that you don’t have atrophy in legs and arms upper body and lower body.”

“It is important to be active, I’ve known that for decades. I mean that people were designed to move, to walk back to our origins in Africa and we see the consequences of sedentary lifestyle and poor diet. My goal was not to live a longer life but to have a higher quality of life and not decline which so many people think are just a part of growing old.”
“I could imagine that for others it would provide motivation that they don’t intrinsically have or had before getting the Fitbit.”

“My wife has one and tracks it on her phone and its kinda fun when we compare what we had done.”

“At the website, you can see and reference back to others (Fitbit group members); gives you the summary of what you have done.”

“I was pretty happy to participate in the study to assess whether or not to exercise, if that is the case will benefit people with a heart condition such as myself.”
The patients had positive response to using the Fitbit as an ambulation measuring device.

They were happy to receive a free Fitbit.

They believe that it is a motivator and therefore beneficial to them.

They think that it has potential to help future heart failure patients in the same situation.

The results of this study can be a basis for further studies.
References:

Thank you!
Gracias!
Salamat po!
Merci!
Any questions?
Axillary IABP insertion
Walking to OR for his heart transplant!
2 IABP patients chatting in the hallways