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

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Experiences of Pre-Heart Transplant Patients with Ambulatory Intraaortic Balloon Pump and Swan Ganz Catheter Using Fitbit as an Ambulation Measuring Device

Purpose:
To explore the experiences of pre-heart transplant patients using Fitbit as an ambulation-measuring device.

Background/Significance:
Pre-heart transplant patients with balloon pump and pulmonary artery catheters with vasopressor drips are associated with prolonged immobility.

Stroke volume is reduced, respiratory capacity decreased causing atelectasis and pneumonia; loss of muscle strength result in atrophy and decubitus ulcers. Secondary consequences include thromboembolic events; insulin resistance, delirium, and sleep disturbances.

Patients were provided a Fitbit, an activity-tracking device. The study explored the patient’s experiences with Fitbit as an ambulation-measuring device.

Methods:
Descriptive phenomenology was used. Purposive sampling of eight pre-heart transplant candidates with cardiac support devices and have ambulation orders was used. Semi-structured interview was done to understand the phenomenon.

Researchers returned to the participants to enhance credibility and validate findings. Researchers collected detailed data to report with sufficient detail and precision. Colleague of the researcher, expert in phenomenology examined the transcript’s interpretations and attested that the findings were supported by the data and are internally coherent. Audit trail will be available upon request for any inquiry. Colaizzi’s method of data analysis was used.

Results:
Using Colaizzi’s method, 144 significant statements were identified during the participant’s interviews which yielded 48 formulated meanings, 41 themes and 4 clusters of themes: Happy, Motivator, Beneficial, and Future Potential. Participants were happy receiving and using the Fitbit. It motivated them to be
active while waiting for a heart in the hospital. Participants did more walking than the standard ambulation activity designed for patients. Patients expressed they slept better at night, sustained their stamina and made them feel stronger. Improved strength can support them during the post-operative recovery process.

**Conclusions and Implications for Practice:**

Fitbit as an ambulation device helped research subjects to be active while waiting for a heart during their hospitalization. Fitbit motivated and inspired them to walk more. They stated that it had benefitted them by increasing their stamina, letting them sleep better and prevent muscle atrophy thru walking more. Some subjects claim that Fitbit will help future heart failure patients like it had helped them. Measurable variables were identified during the interviews that the team plans to incorporate on their next Fitbit study using quantitative methods.

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**Title:**

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

**Keywords:**

Ambulatory intra-aortic balloon pump, Pre heart transplant Fitbit use and congestive heart failure

**References:**


dos Santos, C. C., Herridge, M., & Batt, J. (2016). Early goal directed mobility in the ICU: 'something in the way you move'. *Journal Of Thoracic Disease, 8*(8), E784-E787. doi: 10.21037/jtd.2016.05.96


Abstract Summary:
This research examines the experiences of pre heart transplant patients with ambulatory intraaortic balloon pump and swan ganz catheter. Each was provided a fitbit to aid with ambulation and mobilization. Recorded interviews were conducted after 2 weeks with fitbit, transcribed and analyzed for similarities and congruencies using Colaizzi's method.

Content Outline:
Aim:
To explore the experiences of pre-heart transplant patients using Fitbit as an ambulation-measuring device.

Background:
More than 500,000 people are diagnosed as having heart failure (HF) each year (Lloyd-Jones et al., 2010). A chronic, debilitating disease that often progresses to end-stage quickly when severe ventricular dysfunction leads to alterations in organ perfusion even at rest. Heart transplantation is the definitive treatment for these patients. While waiting for transplantation, HF patients are typically medically managed with Guideline Directed Medical Therapy (GDMT) and they are very prone to less than optimal mobility (Hashim, 2015). Prolonged immobilization results in severe widespread deconditioning affecting multiple organs and systems. Prolonged immobilization results in profound loss of muscle strength and endurance of every muscle in the body. Immobilized 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). Inactivity and prolonged bed rest have also been shown to result in cardiac deconditioning affecting both the central and peripheral cardiovascular systems. Stroke volume has been shown to be reduced by 30% within the first month of bed rest, with an associated increase in resting heart rate, and signs of orthostatic intolerance can develop within 72 hours of inactivity (Winkleman, 2009; Convertino, Bloomfield, & Greenleaf, 1997; Koo, & Fan 2013). Other secondary consequences include increased risk of thromboembolic events, insulin resistance and development of delirium or cognitive impairments and alterations in sleep patterns (Parry, & Puthucheary, 2015; Winkleman, 2009; Convertino, Bloomfield, & Greenleaf, 1997; Koo, & Fan 2013).

It is imperative that while waiting for a definitive treatment, HF patients need to be mobilized so their muscles will not lose their function. When medical treatment becomes ineffective, invasive pulmonary artery catheter monitoring with concurrent vasopressor support or mechanical support, one which intraaortic balloon pump (IABP), is instituted. These treatments further reduce the patient ability to mobilize and walk since they require monitoring wires and cables. Traditional femoral inserted IABP requires complete bedrest. Cardiologists at our hospital have developed a novel percutaneous left axillary-subclavian artery IABP insertion approach to allow patients to mobilize out of bed while awaiting heart transplantation. Percutaneously placed axillary-subclavian intra-aortic balloon pump (IABP) support the patient’s heart while waiting for heart transplantation enabling them to ambulate. Pre-heart transplant patient with Swan-Ganz catheters and one inotropic drip are the second group in this study; Swan-Ganz catheters measures pulmonary artery pressures and inserted via the internal jugular route. These patients are usually more mobile than the first classification. An innovative approach using Fitbit to measure accurately the number of steps patient took during their ambulation process was implemented. Experiences of these patients was explored using descriptive phenomenology to uncover the commonalities of the experience these patient have using Fitbit as an ambulation measurement device.

Research Design:
Methodology:

Setting

This study was conducted in Coronary Intensive Care unit where patients with NYHA class IV HF patients were waiting for a heart transplant. The study subjects had either a Swan-Ganz catheter and one inotropic drip or an axillary-subclavian IABP, and have doctors’ orders to ambulate.

Recruitment, Sample, Sampling Method and Sample Size

Participants were recruited from CICU unit who were pre-heart transplant candidates with cardiac support devices (axillary-subclavian IABP and Swan-Ganz catheters with one inotropic IV drip) and have ambulation orders. The goal was to recruit five to ten participants. Potential participants were approached in the afternoon when patients were resting and low to no activity was scheduled. The principal investigator (PI) or members of the study team met with potential participants and informed the patient about the background and present knowledge of the study and alternative intervention. It was explained that refusal to participate will involve no penalty or loss of benefits to which the study participant is otherwise entitled. The study team reviewed the entire consent to explain the risk, benefits and alternatives to the participants. The participants were given time to review the consent form and discuss with family / friends. All questions were answered by the study team. The study participants were asked open ended questions to ensure that they understood the research 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). Husserl claimed human experiences have value and should be an object of scientific study. There are scientific approaches that bring these experiences to light. True to Husserlian philosophy is the use of universal essence or eidetic structures, which means that in any study of human consciousness, there are commonalities of experience that are identified. The essence of human experiences represents one cumulative and conclusive interpretation of the experiences without regard of context (Lopez & Willis, 2004).

Data Collection

Once informed consent was obtained, the researcher or any of the study team scheduled a time for the participant's interview at their convenience in their room. Data collectors /research team assist with the interview. The data collectors were trained on how to interview the participants. The interview activity time was approximately 60 minutes. The primary investigator (PI) and the study team decided on a code name for the participants to use during the interview. With permission from the participants, the interview was audio taped to confirm written transcripts.

Participants were asked questions from the semi-structured interview guide. Deliberate silence was used as needed in order to help participants reflect and elaborate on their viewpoints. This allowed for an in-depth understanding of the phenomenon. The researcher constantly guarded his/her beliefs and maintained a self-reflective stance throughout the interview process (See Appendix A). The interviews were audiotape recorded. And audiotape data was transcribed. The patients were contacted by email and regular mail after the responses were tallied and analyzed to verify the findings.

Data Analysis

The study utilized the Colaizzi’s method of data analysis consisting of the following steps: (1) describe the phenomenon of interest, (2) collect participant's description of the phenomenon, (3) read all participants’ description of phenomenon, (4) return the original transcripts and extract significant statements, (5) spell out the meaning of each significant statement, (6) organize the aggregate formalized meaning into clusters of themes, (7) write an exhaustive description, (8) return to the participants for validation of the
description, and (9) if new data are revealed during the validation, incorporate them into an exhaustive
description (Speziale & Carpenter, 2007).

To enhance the **credibility** of the findings, the researcher returned to the informants to validate the
findings thru email and regular mail. **Purposive sampling** was selected so the range of specific
information about the experience can be maximized. For **transferability**, the principal investigator
collected detailed data to report with sufficient detail and precision. To enhance the **dependability** of the
study, a colleague of the researcher, experienced in phenomenological methodology examined the
transcripts, interpretations, and recommendations and sought attestation that the findings were supported
by the data and are internally coherent. To address **confirmability**, an audit trail was preserved and will
be available upon request to support any inquiry about the conclusions, interpretations and
recommendations so it can be traced to their sources. The audit trail is useful in validating and confirming
study findings. According to Sandelowski (1986), the results of the study are appraisable when another
researcher can clearly track the decision trail used by the investigator in the study and can arrive at the
similar or, perspective.

Results:

The study had 8 respondents, 7 males and 1 female; mean age 61; IABP-4, swan ganz-4. Using
Colaiizi’s method, 144 significant statements were identified during the participant’s interviews which
yielded 48 formulated meanings, 14 themes and 4 clusters of themes: Happy, Motivator, Beneficial, and
Future Potential.

**Conclusions and Implications for Practice:**

Study participants claims to have had experienced benefits from using the Fitbit as an ambulation device.
They were happy to get a Fitbit. They were motivated to walk more and stay more active; they benefitted
from walking more by experiencing better sleep at night, increasing their stamina, feeling stronger and
they believe that it will help them with their post-operative recovery. Some of the patients believe Fitbit as
an ambulation device could help future pre-heart transplant patients to be active while waiting for a heart
transplant during their hospitalization.

First Primary Presenting Author

**Primary Presenting Author**

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**Professional Experience:** Experience in taking care of heart failure and pre heart transplant ambulatory
IABP patients since the procedure was started in 2007. Primary researcher on Fitbit use for pre heart
transplant patients. Presented at local, regional, national and international critical care/transplant nursing
conferences (oral and poster) Primary researcher/published author on ambulatory Axillary IABP
retrospective research study- JNEP, 2018

**Author Summary:** Mr. Macapagal has been a coronary critical care nurse for 20 years. He is the primary
researcher on the subject with 3 other co-researchers. He has presented(oral/posters) on this subject
matter in local, national, and international critical care/transplant nursing conferences. Published author
on the ambulatory IABP research; nursing care of ambulatory IABP patients(accepted pending
publication). He is the primary researcher on the use of fitbit by 1A pre heart transplant patients in their CICU.

Second Secondary Presenting Author

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**Professional Experience:** 1989-2000- Staff RN CCU Methodist Hospital 2000-2005- Nurse Manager Cardiac Intensive Care Unit (CICU) 2006-2009- Director CICU Methodist Hospital 2009-2010- Operations Administration Methodist Hospital 2010-Present- Director CICU

**Author Summary:** I have been working with this patient population since the initiation of the therapy. I have been in multiple roles as the process has evolved. I have worked at the bedside as a staff nurse and I have been the resource and supporter from a leadership perspective. This program has grown and evolved over time.

Third Secondary Presenting Author

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**Professional Experience:** Assistant researcher on the Fitbit research project; Unit educator-Corony Intensive Care Unit; poster presenter at National Teaching Institute 2018 in Boston, TED talk presenter (various topics).

**Author Summary:** Miss Rodriguez had presented several topics on TED talk at the Houston Methodist Hospital: She has extensive experience with talking to people and educating the nursing staff in CICU about new products, new procedures, and does regular lectures with student nurses.

Fourth Secondary Presenting Author

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**Professional Experience:** Involved in research since 2007. Involved in several evidence-based practice and research initiatives. Currently serving as Nurse Scientist at the Houston Methodist Center for
Professional Excellence.

**Author Summary:** Nurse Scientist at the Center for Professional Excellence at Houston Methodist Hospital. Advanced Practice Nurse specializing in outcomes management. Additionally, serves as Director of Nursing Education and Magnet Program Director focusing on Nursing Engagement.