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**A Comparison of Usual to Best Practices in Cardiac Rehabilitation Education**

by

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**Abstract**

Cardiac medical conditions are the leading cause of death worldwide. Cardiac rehabilitation following hospitalizations for cardiac events is used as a means to improve client functional status and well-being. Knowledge of the best cardiac rehabilitation methods is needed to support implementation of best practices. A program evaluation was conducted to assess the program and the barriers and facilitators for cardiac rehabilitation education in a rehabilitation center in eastern North Carolina. Some of the barriers to education included health literacy, race, language, and ability to use technology. Five key informants responded to a questionnaire, and a policy review was conducted. Data collection from key informants revealed that the nurses at the center felt well-trained to perform education and were able to understand the needs of their clients. They also believed they were well-equipped to overcome the barriers to education. However, the nurses also believed their client population would not benefit from new technological approaches to education suggested in the literature due to perceived barriers of client age and potential inability to use technology. The policy review showed that the policy and procedure handbook did not include anything about technology use. Both policies and staff reports, however, revealed ways to deal with health disparities in education. Recommendations included integrating simple take-home technology for patients in cardiac rehabilitation in addition to the regular program. Adding such approaches as a phone calls, text messages, online diaries, or website referrals whenever possible may aid clients in carrying out the therapy regimen at home.

*Keywords:* Cardiac Rehabilitation, Best Practice, Education Protocol

### A Comparison of Usual to Best Practices in Cardiac Rehabilitation Education

This senior honors project was completed at a cardiac rehabilitation program associated with a regional medical center in eastern North Carolina in conjunction with the core community health course in a baccalaureate nursing program. Students are assigned to work with a registered nurse (RN) preceptor in a community-based health care setting for a clinical practicum experience. During this practicum, data collection and analysis were conducted for the purpose of comparing the cardiac rehabilitation program with best practices identified in the literature. The honors project also met the course requirement of a Community Service Learning Project.

#### **Background and Significance**

In 2012, an estimated 17.5 million people died from cardiac disease globally (WHO, 2015). People of all ages are affected by heart disease. The researchers at the Centers for Disease Control and Prevention (CDC, 2015) report that 610,000 people die of heart disease in the United States every year, which means that 1 in 4 deaths each year are due to a heart condition. North Carolina's mortality rate for heart disease has been equal to the national average (North Carolina Institute of Medicine [NCIOM], 2011). Noting that an increase in mortality is partially due to an increase in modifiable risk factors, such as hypertension, obesity, high cholesterol and diabetes, and as much as 50% of individual health can be attributed to behavior alone, the NCIOM (2011) report emphasizes that education both before and after a cardiac event helps prevent mortality.

#### **Review of Literature**

Cardiac rehabilitation has traditionally been performed in a facility where patients go to receive their care, whether inpatient or outpatient. Because of the rise in the use of technology, other options have become available. Patients are now able to remotely carry out their

rehabilitation exercises, follow meal plans, and maintain their medication regimens. This can be initiated through text message reminders, calls, e-mails, or telehealth models. Kraal et al. (2014) state that “there is a need for innovative rehabilitation methods aiming at an increase of [cardiac rehabilitation] uptake” (p. 27). From the initial review of literature, I determined that there were two areas pertinent to this evaluation: program format and barriers to education.

Traditional center-based rehabilitation programs have provided productive outcomes in the past. There are many different options for how to provide the care, but they must encompass diet, exercise, and medication adherence training as well as how to detect the signs of impending cardiac issues (AHA, 2015). Gallagher et al. (2013) performed a qualitative study of patients who were prescribed sublingual nitroglycerin in Sydney, Australia. They found that a brief education session tailored to the needs of the patient can improve patient outcomes and adherence. Cottell, Dorfman, Straight, Delmonico and Lofgren (2011) surveyed 96 participants, including 16 males and 80 females, and found that there was a decrease in congestive heart disease risk in overweight and obese older adults following diet education and resistance in a center-based rehabilitation program. Otsu and Moriyama (2011) state that continued long-term education is necessary for the best possible outcomes. Center-based programs have demonstrated to be very effective for many patients and have decreased mortality and readmission rates (Thomas et al., 2010). However, Rortveit et al. (2015) determined through a review of qualitative studies that in order to have the best possible outcomes nurses must have a strong positive relationship with the patients, as well as other nurses. Through this relationship nurses are able to establish a trusting relationship and a positive learning environment.

One intervention using center-based cardiac rehabilitation with demonstrated effectiveness was the Transitional Rehabilitation Using Self-Management Techniques (TRUST)

model. Using this model, Dolansky, Zullo, Boxer, and Moore (2011) recognized that cardiac self-management instruction and exercise monitoring during post-acute care resulted in higher rehabilitation attendance and more steps walked, therefore better patient outcomes. According to Haykowsky et al. (2011), exercise is extremely important in the post-injury phase for a patient who has had a cardiac event. Because ejection fraction decreases each day between cardiac events and initiation of an exercise program, education on this topic needs to be performed as quickly after the event as possible to allow for the patients to understand what recovery will require (Haykowsky et al., 2011).

Other interventions have been found to be helpful for maintaining a healthy lifestyle after a cardiac issue. The Nurse Follow-up Dietary Intervention (NFDI) for self-management is an effective program for managing diet (Mok et al., 2013). Mok et al. (2013) explains that it is extremely important because low-sodium diets and heart healthy foods are required following a heart issue to prevent further damage. Mok et al. (2013) also delves into the nurse's role in cardiac rehabilitation education, saying that nurses in this position need to become very knowledgeable about the subject on which they are providing education in order to empower the patients to the highest degree possible.

Lynggard et al. (2014) found that teaching patients how to cope with their situation, along with cardiac rehabilitation, improves the outcomes of patients undergoing cardiac rehabilitation. Individuals in these circumstances need to learn how to overcome the obstacles that they will face as well as how to cope with the situation that they are in (Lynggard et al., 2014).

Technology is a newer and more innovative choice for cardiac rehabilitation. In a non-randomized quasi-experimental controlled trial, Scalvini et al. (2013) discovered that though technology is a strong prospect when it comes to educational programs, the outcomes have not

been shown to be substantially more beneficial than those in the center-based facilities. The review of literature revealed that not as many studies have been performed on this method in the United States, though a wide variety of studies on the topic have been carried out worldwide.

Through a randomized controlled trial in northern California, Park, Howie-Esquivel, Whooley, and Dracup (2014) found that text messaging to improve medication adherence is not effective. They noted that medication adherence training may be better performed in a facility rather than relying on the person to do as they are supposed to when they return home. Kraal et al. (2014) found that there were similar short-term outcomes when compared to home-based exercise training. Furthermore, Whittaker and Wade (2014) and Beatty, Fukuoka, and Whooley (2013) both determined that there was more flexibility for patients using technology for cardiac rehabilitation and cost was decreased, but whether participation was increased was not yet identified.

Walker, Elder, and Hayes (2014) studied the use of the website MyMedSchedule.com, which was designed to help patients remember to take their medications. Following a cardiac event, a patient-centered method to improve medication adherence needs to be utilized because of the major issues that can arise (Walker et al., 2014). This site provided patients with free medication information, schedules, reminders, and a health tracker through the use of a simple website. However, use of this website did not result in better outcomes or improved medication adherence for the patients who used it (Walker et al., 2014). These researchers stated that MyMedSchedule.com is not something that should be used in practice, and they noted that patients often see websites and electronic methods as a burden because computers can be hard to use and can cause confusion. Furthermore, Walker et al. (2014) explained that nurses must be on stand-by over the phone to answer questions and informational pamphlets should be readily

available before patients leave the hospital because nurses are important in the education of patients.

The Hospital2Home (H2H) program is an example of an outpatient technology-based rehabilitation design. This program assists patients in making follow-up appointments within 7 days of returning home, knowing the signs and symptoms of an emergency, and knowing about their medications (Cunningham, Lewis, Cox, & Lenihan, 2011). It was evident after a quantitative 30-day follow-up study in Tennessee that Hospital2Home could decrease the 30-day readmission rate in patients with heart failure (Cunningham et al., 2011). Education is done and appointments made before patients leave the hospital, but the follow-up happens outside of the facility through messages sent directly to the person's e-mail inbox. This program has the potential of being an effective technology-based program for hospitals to apply, however to prove effective a study needs to be done with a larger sample size (Cunningham et al., 2011).

The Bridging the Discharge Gap Effectively (BRIDGE) program is one in which nurses assess patients' clinical status, make adjustments in therapeutic regimens, educate patients and families on health promoting activities, and refer to outpatient providers when necessary (Bumpus, 2012). The BRIDGE program uses state-of-the-art communications and informational technology to connect with BRIDGE clinics and patients. Bumpus (2012) determined there were no differences in persistence of adherence to medication regimen rates for those who attended the BRIDGE program, but they did have lower readmission rates.

There were other indicated advantages to technology-based programs, including less travel to a facility and more flexibility. However, the studies reviewed did not find that technology-based programs provided the best outcomes. Center-based programs provide for face-to-face education and allow the patients to ask questions as they need to (Thomas et al.,

2010). Thomas et al. (2010) explain that center-based programs also give the patients one-on-one time so that the case can be evaluated based on the patient's specific needs. Follow-up through technology could be effective, but more studies and interventions need to be created to provide more educational opportunities that can be performed at a distance (Scalvini et al., 2013).

However, no matter where the intervention is performed, the program must entail diet, medication, lifestyle, and warning-sign education in order to provide well-rounded care (AHA, 2015).

Barriers to purposeful cardiac rehabilitation teaching were identified in the literature review. These include lack of ability to use technology (Aggarwal, Pender, Mosca & Mochari-Greenberger, 2015), race (Dickson, Knafl & Riegel, 2015), language (Vaughn, 2012), and health literacy (Mattson, Rawson, Hughes, Waechter & Rosneck, 2015).

One of the foci of this literature review is the use of technology-based cardiac rehabilitation and its positive and negative implications. For those who cannot use technology, it can be a major barrier to education during rehabilitation. In the mixed methods study by Aggarwal et al. (2015), mobile applications, automated check-ins, and text message medication reminders were used in an effort to improve medication adherence by those undergoing rehabilitation. The results revealed that many of the patients did not feel comfortable with the technology they were given and therefore were unable to take advantage of the resources given (Aggarwal et al., 2015). Karunanithi & Varnfield, (2015) determined through a literature review of articles about secondary prevention following a cardiac event that an inability to understand or use technology can be a barrier for those who are trying to better their lives through cardiac rehabilitation.



Race is associated with specific risk factors for heart disease and can be a potential determinant of how well people will adhere to their cardiac rehabilitation as well. Dickson et. al (2015) explained that African Americans with heart failure have more risk factors than whites for low medication adherence. This presents a barrier for effective cardiac rehabilitation to take place. A key concept in cardiac rehabilitation is educating patients on how to adhere to their medication regimen. Without this key element, recovery and prevention cannot be attained (Dickson et al., 2015).

Language barriers can negatively affect cardiac rehabilitation. Jones and Boyle (2011) determined that translators can create a barrier for those who are trying to understand complex medical concepts because languages have specific words for medical terms and it may be difficult to fully understand English-based terminology. Vaughn (2012) followed Spanish speaking patients as they watched a 7-minute “telenovela”, which is an educational video on cardiac rehabilitation concepts that is presented in Spanish as an attempt to overcome this barrier. The group had knowledge of the relationship between food and health after the intervention, indicating that there are ways to overcome this language barrier. Vaughn (2012) reveals through this study that there must be tools such as this “telenovela” to ensure that people who speak languages other than English can understand the information that is being provided.

Finally, lack of health literacy has an impact on the way that people receive and understand information as they undergo rehabilitation. Mattson, Rawson, Hughes, Waechter, and Rosneck (2015) surveyed 191 cardiac rehabilitation patients and found that there was a very strong correlation between health literacy and cardiac knowledge. According to Mattson et al., people who are unable to understand the concepts being provided to them are much less likely to engage in the rehabilitation process and comply with the interventions. It is hard for people to

take medications when they do not understand what they are for, and people do not want to change their diet and lifestyle if they are not presented the risk factors in a way that they can understand (Mattson et al., 2015). Mattson et al. (2015) explains that there still need to be more studies performed on how to best provide screening measures for health literacy of all patients entering the health care setting.

## **Method**

### **Setting and Sample**

The major issue driving this program evaluation is the prevalence of heart related issues in eastern North Carolina. People of all ages are affected by heart disease in this population. From 2008 to 2013, heart disease was the second leading cause of death in the county, accounting for 164.5 deaths per 100,000. (Craven County Health Department, 2014) The national rate of deaths as a result of heart disease is 193.3 deaths per 100,000. (Centers for Disease Control and Prevention, 2013) Nationally, heart disease accounts for 168.2 out of 100,000 deaths in Caucasians and 210.4 deaths per 100,000 in African Americans. (Centers for Disease Control and Prevention, 2013)

The sample that was used for this program evaluation was the Cardiac Rehabilitation program and its staff affiliated with a medical center in eastern North Carolina. This is the setting where the program evaluation was performed. I designed data collection to include questions for the nurses, respiratory therapist, exercise specialist, and unit manager in the facility related to the evaluation foci, including the demographics and the policies of the facility. I also reviewed standards and policies guiding the program as I performed my role weekly of observing patient interactions, carrying out the assigned role in the facility, and reviewing the program's outcome reports. The practices utilized in the outpatient setting were assessed and compared with the best

practice protocol. I observed the patient care as I followed my preceptor through her daily activities and interventions during the clinical practicum. I observed the client population, including gender, race, socioeconomic status, and languages, finding that the population receiving care were about equal between male and female and had a slightly higher population of English speaking Caucasians than African Americans. The socioeconomic status varied between the patients, though a majority of them are over 65 and receiving Medicare.

### **Program Evaluation**

Staff at the cardiac rehabilitation center in eastern North Carolina was asked to respond to questions to assess currently utilized interventions for cardiac rehabilitation education as I carried out my assigned role in the facility. I then reviewed the program's outcome reports. The key informant questions were asked of the nurses, respiratory therapist, exercise specialist, and unit manager in the facility. Questions about medication, dietary, lifestyle, and warning sign education were included, as well as how race, language, health literacy, and ability to use technology were barriers to this education. Questions about the use of technology as opposed to center-based education and the training that was provided for these techniques were also included. The questions were designed to look at the views of the staff employed in the agency about cardiac education and the training that was delivered, including educational materials that were provided to the patients. I evaluated the nurse's role in the education and what additional resources were included in the overall care. According to Kun, Kassim, Howze, and MacDonald (2013), key informants are well supported by the literature because they provide a close-up understanding from the perspective of someone who frequently has interaction with a particular group. In addition to gathering information from the staff, I performed a policy review to determine whether the policies included a standardized format for education administration. This

also included an evaluation of whether the policies provided for ways to alleviate the barriers that were previously mentioned and whether all areas of education were included in the guidelines set forth in the policies.

The individual key informants were asked to answer questions candidly based on their views about the facility. When comparing the answers of each informant, I was able to evaluate the effectiveness of the policy handbook in accomplishing education protocol. My work involved the public health intervention of surveillance as I looked into their activities and policies to see how they were working for the patient population. Collaboration was also included, as I worked with the staff at the cardiac rehabilitation facility to bring together my findings. I was able to tailor the needs to my specific population by working in the area alongside people who lived in that area. These methods worked well with this population because learning from key informants allowed me to obtain knowledge from someone who is frequently around these patients. The policy overview helped me to understand the background behind everything they do. All of these things have led to understanding the program that is being implemented and how it compares to best practice. I carried out the final steps of my plan by organizing and presenting my findings.

### **Findings**

The findings from this program evaluation were: (1) The program layout was solely center-based because staff believed that their client population would not be able to handle new technology. (2) Policies did not include any guidelines for technology use. (3) Both policies and staff reports revealed ways to deal with health disparities in education. (4) Nurses felt well-trained to perform education and were able to understand the needs of their patients. The main strength identified was the collaboration with all members of the team. The unit manager, two registered nurses, respiratory therapist, and exercise specialist all came together to share about

their education practices from their specialty. The challenge was that the literature review revealed technology was beneficial but the staff members did not think it was feasible for their program and were not very receptive of the idea. The findings indicate that the unit had excellent outcomes, but that the staff members may be able to further their educational efforts by adding technological follow-up for their patients.

Table 1 shows key informant responses to the questions regarding the program.

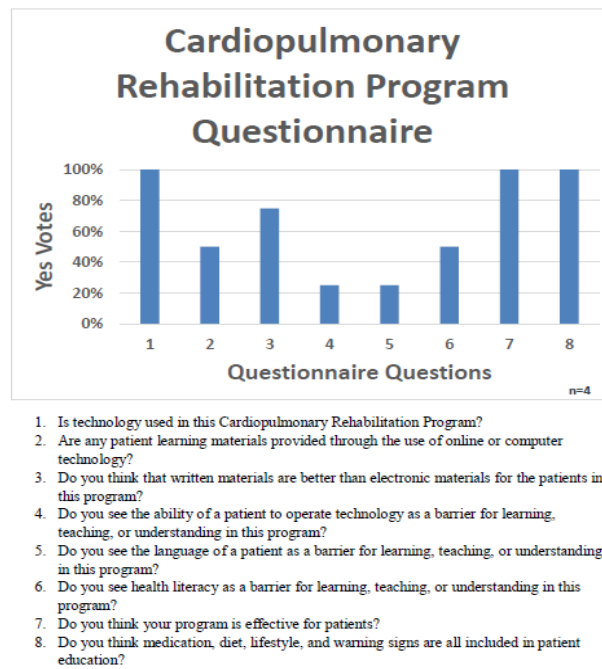


Table 1

**Limitations**

The main limitation in this project was the limited number of key informants. A physician could not be included because one is not frequently available on the unit at all times. The results may have been different with a larger sample size and more disciplines.

### **Implications for Practice and Policy**

Based on the literature review and the evaluation of the facility, attempts should be made to integrate some take-home technology for patients in cardiac rehabilitation in addition to the regular program. Patients may be provided the opportunity to receive a phone call, text message, online diary, or website referral whenever possible to aid in carrying out the therapy regimen at home. Though it is believed that older people are not capable of incorporating technology, everyone is capable of using the resources though they may need training. Outcomes may be improved if patients are stimulated outside the facility setting because it is important to follow-up with these patients on the days they are not coming in, as well as afterwards to see how they progress and whether they comply with the regimen. Efforts should also be made to address health literacy, language barriers, and race disparities.

**References**

- Aggarwal, B., Pender, A., Mosca, L., & Mochari-Greenberger, H. (2015). Factors associated with medication adherence among heart failure patients and their caregivers. *Journal of Nursing Education and Practice*, 5(3), 22-27. doi:<http://dx.doi.org/10.5430/jnep.v5n3p22>
- American Heart Association (2015). What is Cardiac Rehabilitation? Retrieved from [http://www.heart.org/HEARTORG/Conditions/More/CardiacRehab/What-is-Cardiac-Rehabilitation\\_UCM\\_307049\\_Article.jsp#.VIPxJHarTIU](http://www.heart.org/HEARTORG/Conditions/More/CardiacRehab/What-is-Cardiac-Rehabilitation_UCM_307049_Article.jsp#.VIPxJHarTIU)
- American Association of Cardiovascular and Pulmonary Rehabilitation (2015). Promoting Health and Preventing Disease. Retrieved from <https://www.aacvpr.org/>
- Beatty, A. L., Fukuoka, Y., & Whooley, M. A. (2013). Using mobile technology for cardiac rehabilitation: a review and framework for development and evaluation. *Journal of the American Heart Association*, 2(6), 1-9. doi:10.1161/JAHA.113.000568
- Bumpus, S. M. (2012). Bridging the discharge gap effectively (BRIDGE): A novel approach to transitional care for patients with acute coronary syndrome. *Journal of the American College of Cardiology* 59(13), 1-92. doi:10.1016/s0735-1097(12)61811-7
- Centers for Disease Control and Prevention. (2013). Heart disease facts. *U.S. Department of Health & Human Services*. Retrieved from <http://www.cdc.gov/heartdisease/facts.htm>
- Cottell, K., Dorfman, L., Straight, C., Delmonico, M., Lofgren, I. (2011). The effects of diet education plus light resistance training on coronary heart disease risk factors in community-dwelling older adults. *National Center for Biotechnology Information*, 15(9), 762-767. doi:10.1007/s12603-011-0099-0

- Craven County Health Department. (2014). *Craven County SOTCH report*. Retrieved from [http://www.cravencountync.gov/departments/hth/documents/2013/2013\\_StateOfTheCountyHealthReport\(Sotch\).pdf](http://www.cravencountync.gov/departments/hth/documents/2013/2013_StateOfTheCountyHealthReport(Sotch).pdf)
- Cunningham, B. L., Lewis, C. M., Cox, Z., & Lenihan, D. (2011). Newly designed heart failure education in a H2H demonstration project. *Heart & Lung - the Journal of Acute and Critical Care*, 40(4), 376-377. doi:10.1016/j.hrtlng.2011.04.028
- Dickson, V. V., Knafl, G. J., & Riegel, B. (2015). Predictors of medication non-adherence differ among black and white patients with heart failure. *Research in Nursing & Health*, 38(4), 289-300. doi:10.1002/nur.21663
- Dolansky, M. A., Zullo, M. D., Boxer, R. S., & Moore, S. M. (2011). Initial efficacy of a cardiac rehabilitation transition program: Cardiac TRUST. *Journal of Gerontological Nursing*, 37(12), 36-44. doi:10.3928/00989134-20111103-01
- Gallagher, R., Belshaw, J., Kirkness, A., Warrington, D., Sadler, L., & Roach, K. (2013). Evaluation of a brief educational intervention to improve knowledge of sublingual nitroglycerin in cardiac rehabilitation patients. *European Journal of Cardiovascular Nursing*, 12(6), 529-535. doi:10.1177/1474515112473694
- Haykowsky, M., Scott, J., Esch, B., Schopflocher, D., Myers, J., Paterson, I., Clark, A. M. (2011). A meta-analysis of the effects of exercise training on left ventricular remodeling following myocardial infarction: Start early and go longer for greatest exercise benefits on remodeling. *Trials*, 12(1), 92-92. doi:10.1186/1745-6215-12-92



- Jones, E. G., & Boyle, J. S. (2011). Working with translators and interpreters in research: Lessons learned. *Journal of Transcultural Nursing, 22*(2), 109-115.  
doi:10.1177/1043659610395767
- Karunanithi, M., & Varnfield, M. (2015). Information and communication technology-based cardiac rehabilitation homecare programs. *Smart Homecare Technology and TeleHealth, 2015*, 69-79. doi:10.2147/SHTT.S75395
- Kraal, J. J., Peek, N., Van den Akker-Van Marle, M. E. L., & Kemps, H. M. (2014). Effects of home-based training with telemonitoring guidance in low to moderate risk patients entering cardiac rehabilitation: Short-term results of the FIT@Home study. *European Journal of Preventive Cardiology, 21*(2), 26-31. doi:10.1177/2047487314552606
- Kun, K., Kassim, A., Howze, E., & MacDonald, G. (2013). Interviewing key informants: Strategic planning for a global public health management program. *The Qualitative Report, 18*(9), 1.
- Lynggaard, V., May, O., Beauchamp, A., Nielsen, C. V., & Wittrup, I. (2014). LC-REHAB: Randomized trial assessing the effect of a new patient education method--learning and coping strategies--in cardiac rehabilitation. *BMC Cardiovascular Disorders, 14*(1), 186.  
doi:10.1186/1471-2261-14-186
- Mattson, C. C., Rawson, K., Hughes, J. W., Waechter, D., & Rosneck, J. (2015). Health literacy predicts cardiac knowledge gains in cardiac rehabilitation participants. *Health Education Journal, 74*(1), 96-102. doi:10.1177/0017896914522029

- Mok, V. K. F., Sit, J. W. H., Tsang, A. S. M., Chair, S. Y., Cheng, T. L., & Chiang, C. (2013). A controlled trial of a nurse follow-up dietary intervention on maintaining a heart-healthy dietary pattern among patients after myocardial infarction. *The Journal of Cardiovascular Nursing*, 28(3), 256-266. doi:10.1097/JCN.0b013e31824a37b7
- North Carolina Institute of Medicine (2011). Healthy North Carolina 2020: A better state of health. Retrieved from <http://publichealth.nc.gov/hnc2020/docs/HNC2020-FINAL-March-revised.pdf>
- Otsu H., Moriyama M. (2011). Effectiveness of an educational self-management program for outpatients with chronic heart failure. *National Center for Biotechnology Information*, 8(2), 140-152. doi: 10.1111/j.1742-7924.2010.00166.x
- Park, L. G., Howie-Esquivel, J., Whooley, M. A., & Dracup, K. (2014). Psychosocial factors and medication adherence among patients with coronary heart disease: A text messaging intervention. *European Journal of Cardiovascular Nursing: Journal of the Working Group on Cardiovascular Nursing of the European Society of Cardiology*, 14(3), 264-273. doi:10.1177/1474515114537024
- Rortveit, K., Hansen, B. S., Leiknes, I., Joa, I., Testad, I., & Severinsson, E. (2015). Patients' experiences of trust in the patient-nurse Relationship—A systematic review of qualitative studies. *Open Journal of Nursing*, 5(3), 195-209. doi:10.4236/ojn.2015.53024
- Scalvini, S., Zanelli, E., Comini, L., Tomba, M. D., Troise, G., Febo, O., & Giordano, A. (2013). Home-based versus in-hospital cardiac rehabilitation after cardiac surgery: A nonrandomized controlled study. *Physical Therapy*, 93(8), 1073-1083. doi:10.2522/ptj.20120212

Thomas, R. J., King, M., Lui, K., Oldridge, N., Piña, I. L., & Spertus, J. (2010).

AACVPR/ACCF/AHA 2010 update: Performance measures on cardiac rehabilitation for referral to cardiac Rehabilitation/Secondary prevention services: A report of the American association of cardiovascular and pulmonary rehabilitation and the American college of cardiology Foundation/American heart association task force on performance measures (writing committee to develop clinical performance measures for cardiac rehabilitation). *Circulation*, *122*(13), 1342-1350. doi:10.1161/CIR.0b013e3181f5185b

Vaughn, S. (2012). Stroke and heart disease prevention education via telenovela: A focus group's evaluation. *Rehabilitation Nursing*, *37*(5), 215-219. doi:10.1002/rnj.053

Walker, C. M., Elder, B. L., & Hayes, K. S. (2014). The role of a self-directed technology to improve medication adherence in heart failure patients. *The Journal for Nurse Practitioners*, *10*(10), 856-863. doi:10.1016/j.nurpra.2014.08.011

Whittaker, F., & Wade, V. (2014). The costs and benefits of technology-enabled, home-based cardiac rehabilitation measured in a randomized controlled trial. *Journal of Telemedicine and Telecare*, *20*(7), 419-422. doi:10.1177/1357633X14552376