

The Association of Discharge Phone Calls in 30-day Readmission Rates

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Abstract

Purpose of Project: The purpose of this project was to assess the association between discharge phone calls and reduced 30-day readmission rates in post-operative cardiac surgery patients.

Methodology: The pilot project design used a retrospective chart review. Descriptive statistics was used to analyze demographic data, and chi-square analysis and Fisher exact test were used to compare data between patients who received and did not receive discharge phone calls.

Results: The results of the study indicated that there is no association between discharge phone calls and 30-day readmission rates. The chi-square value was not significant, $\chi^2 (1, N = 80) = 0.59, p = .44$. Fisher's exact test was also used to provide additional verification. That probability was also not significant ($p = 1.00$).

Implications for Practice: This project has a policy implication in inpatient and outpatient institutions. Through discharge phone calls, patients are given the opportunity to be in charge of their health, and health care providers are able to reinforce education and provide support to the patients. This study, which proposes evidence-based practice, is based on the aims initiated by the Institute of Medicine for the healthcare system: "safe, effective, patient centered, timely, efficient, and equitable" (AHRQ, 2018). As such, this study emphasizes the importance of implementation of strategic ways to improve quality of care to patients.

Keywords: Postoperative care, discharge phone call, readmission, readmission rate

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Introduction

One of the significant problems in the United States healthcare system is rehospitalization rates within thirty days of discharge from the hospital (McIlvennan, Eapen, & Allen, 2015). It was found that about 20% of all Medicare patients who have been discharged were more likely to be readmitted within 30 days (McIlvennan et al., 2015). A study has proven that after patients have been discharged to their respective homes, about one in five patients developed complications (J. D. Harrison, Auerbach, Quinn, Kynoch, & Mourad, 2014). Another study suggested that through a thorough discharge process and following up with the patient's condition post discharge via a discharge phone call, 12% to 75% of the readmissions are prevented (P. L. Harrison, Hara, Pope, Young, & Rula, 2011).

The Agency for Healthcare Research and Quality (AHRQ) developed a toolkit called Re-Engineered Discharge (RED) that aids in reconstructing the hospital discharge process in order to reduce readmission rates after hospital discharge (AHRQ, 2013). In one study conducted to evaluate the effectiveness of this toolkit, it was found that rehospitalization rates were decreased by 32% (Adams, Stephens, Whiteman, Kersteen, & Katruska, 2014). The purpose of the scripted discharge phone call is to enable post-discharge patients to have continuity of care outside of the hospital setting. The benefit of this intervention is to lessen hospital readmission rates and to improve patient outcomes. With regard to the financial impact of this intervention on healthcare facilities, reduced readmission rates provide benefits through reduction of costs associated with hospital readmissions (J. D. Harrison et al., 2014). Avoidable hospital readmissions are estimated to make up approximately \$17.4 billion in costs from the roughly \$100 billion Medicare budget (Iribarne et al., 2014). In conclusion, discharge phone calls can have a positive impact on reducing readmission rates. Population specific questions based on

different patient populations can result in better outcomes in quality improvement. The saved money that is obtained from the reduction in readmission rates can be used for future medical research and medical innovation (Osei, 2017).

Background and Significance

One of the significant cost drivers in hospitals is the increased length of hospital stay (Ginsburg, 2009). Associated with this primary cost driver are patient readmissions. Readmission is described as unintended hospital stay after patients are discharged to their home (P. L. Harrison et al., 2011). Various factors cause readmission, and some of these include disease progression and poor quality of post-discharge patient care (P. L. Harrison et al., 2011). Post-operative cardiac surgery patients have readmission rates ranging from 7% to 20% (Iribarne et al., 2014). Results of a study conducted by Iribarne et al. (2014) found that in the State of New York, the rates of readmission in cardiac surgery range from 8.3% to 21.1%.

Readmission of post-operative cardiac surgery patients poses an important burden on hospitals and healthcare providers; hence, it is crucial to address this issue and to provide added care to this particular patient population (Tully, Baker, Turnbull, & Winefield, 2008). In the specialty of cardiac surgery, the most prevalent causes of hospital readmissions within thirty days were the following: infection (17.1%), arrhythmia (17.1%), and fluid overload (13.5%) (Iribarne et al., 2014). Studies have also reported that unplanned hospital stays can affect patient outcomes, such as putting patients at risk of developing nosocomial infections, and deteriorating health (Felix, Seaberg, Bursac, Thostenson, & Stewart, 2015).

In a study that evaluated the frequency, timing, and risk factors in post-operative cardiac surgery patients, results showed an overall readmission rate of 18.7%, and out of the patients readmitted, 11.5% underwent more than one readmission. Results from the same study also

showed that during the first readmission, the median length of stay was 5 days (Iribarne et al., 2014). This short duration of hospital length of stay was found to be one of the main reasons for readmission (P. L. Harrison et al., 2011). For post-operative cardiac surgery patients, or for any patients who have undergone surgery in general, the first six weeks following the operation are considered a crucial time (Johnson, 2000). Complications commonly arise during this period, which primarily occurs once a patient has transitioned to his or her home (Furuya et al., 2013). Patients prematurely discharged often do not receive comprehensive discharge education from healthcare providers (Furuya et al., 2013). Through proper discharge education, post-discharge patients are able to take care of themselves and to communicate significant concerns regarding their condition to their healthcare providers (Furuya et al., 2013).

In order to provide excellent quality of patient care, new or innovative practice models are needed (Walker & Polancich, 2015). To achieve this, primary care providers, particularly advanced practice nurses with a practice-based doctorate (e.g., Doctor of Nursing Practice [DNP]), could play an essential role in finding ways to improve patient care practices, especially in complex healthcare settings (Patel & Dickerson, 2018). One of the roles of a DNP is to be the healthcare leader in formulating innovative strategies and practice changes to produce better patient outcomes and the highest quality of care. Good patient outcomes are often achieved through evidence-based practice (EBP). EBP is an integral part of DNP education and a way of reinforcing the application and impact of interventions developed through research (Edwards, Coddington, Erler, & Kirkpatrick, 2018). It is anticipated that the implementation of this study will result in improved patient care and outcomes through facilitating knowledge sharing, re-enforcement of discharge education, efficient management of symptoms, and early detection of complications (Felix et al., 2015). Advanced practice nurses and stakeholders can work hand in

hand for improvement in healthcare and the development of an outstanding quality intervention that promotes patient safety.

Recent efforts on limiting healthcare spending have focused on monitoring 30-day readmission rates after hospitalization. The healthcare system spends a large amount of money annually for hospital readmissions (Kripalani, Theobald, Anctil, & Vasilevskis, 2014). In order to address this, the Centers for Medicare and Medicaid (CMS) presented its Hospital Readmission Reduction Program in 2012, which regulates readmission and costs by imposing penalties to hospitals with excess readmission for three medical conditions (Shih & Dimick, 2014). Hospitals with excessive readmissions are required to pay up to 1% to 3% of their total CMS reimbursement as penalties (Kripalani et al., 2014). Currently, the estimated total cost of penalties amounts to \$280 million annually (Iribarne et al., 2014).

The impact of unplanned 30-day readmissions in clinical settings is all encompassing, and one notable aspect is the relationship between these readmissions and gaps in the transition of care. Some solutions for these gaps include follow-up phone calls, which are a means to connect with post-discharge patients to assess and emphasize discharge plans (Soong et al., 2014), and programs or toolkits specifically designed for discharge processes.

The Boston Medical University Medical Center research team created RED Toolkit. One of the components of the toolkit is the discharge phone call script (AHRQ, 2013). The phone call script consists of questions addressed to patients that cover their overall health after discharge, their prescribed medications, the appointments that they need to schedule, any issues with the home services, and education about strategies if some concerns or issues occur (AHRQ, 2013). Patel & Dickerson (2018) reported that after the implementation of Project RED, patients were able to go through the transition of care with ease, and they became more likely to comply with

their scheduled clinic visits. Although these outcomes are promising, the literature on the application and impact of these outcomes to more specific patient populations remain limited. Therefore, this DNP project will assess the association of discharge phone calls in 30-day readmission rates in post-operative cardiac surgery patients.

Needs Assessment

CMS indicated that the national rate for readmission in the United States after release from the hospital within 30 days is 15.3%. The readmission rate for unplanned hospital visits in New York State is 15.92%. As previously discussed, these high readmission rates are factors for the increasing healthcare expenditures, and therefore, much focus has been dedicated to lowering these rates in order to achieve high quality of care and decrease healthcare costs in the United States (Iribarne et al., 2014).

According to the Department of Health NYS Health Profiles, the 30-day unplanned readmission rate of the target site is 16.20%. This data was from July 2016 to June 2017. Coronary Artery Bypass Graft (CABG) readmission rates in the target site is 27.54% (personal Communication, February 2019). This readmission rate is one of the key factors that the hospital or other hospitals, in general, strive to come up with solutions to address the issue on high readmission rates. In a broader, global context, the problem of high readmission rates was addressed by another controlled trial that took place in Australia (Hamar et al., 2018). The study found that follow-up phone calls were effective in reducing readmissions, specifically readmissions of high-risk populations such as older patients and patients with heart failure; this finding is backed up by a decrease in readmission rate by 29% (Hamar et al., 2018). Follow-up phone calls can be a predictor of patient readmission and patient assessment and, in a larger

scale, can become an effective hospital protocol once carried out in a scripted and well-timed manner (D'Amore, Murray, Powers, & Johnson, 2011).

Various ways of addressing readmission and post-discharge issues are underway. One example of such methods is through conducting discharge phone calls, which are a component of the RED toolkit, as previously discussed. Discharge phone calls are one of the interventions used in the cardiothoracic surgery step-down unit of a 745-bed hospital located in the Tri-State area. The unit has been using the program called Patient Care Manager, which contains information on discharged patients (personal communication, January 23, 2019). The program has hospital-wide pre-set questionnaires that the discharge nurse would ask the caretaker of the patient or the patient himself/herself (personal communication, January 23, 2019). The questionnaire covers patients' queries regarding the discharge instructions given to them, patients' queries regarding their hospital stay, and patients' suggestions for improvement (personal communication, January 23, 2019). A clinical nurse in the unit (personal communication, January 26, 2019) stated that the telephone call follow-up program started about five years ago. One of the nurses also mentioned that phone calls should be specific to the patient population. The questions should be tailored to fit the conditions and needs of a particular patient population. For instance, because the nurse worked on the cardiothoracic surgery unit, it would be appropriate if questions presented to the patient are similar to "What does your wound look like?", "Did you schedule your appointments with your doctors?", and "Are you taking all the prescribed medicine?" (personal communication, January 26, 2019). The purpose of implementing discharge phone calls is to follow up with the patients after discharge and to make sure that the patients understood the discharge instructions. This is important because patients undergo so many emotions when they are in the hospital and when they are about to leave the hospital, and this stress impacts their

learning capabilities (personal communication, February 27, 2019). The follow-up phone call questions are not specific to some patient populations. This means that although there are pre-set questionnaires prepared for these phone calls, these questionnaires contain general questions and are not all-encompassing or specific. Also, as per the nurse, these discharge phone calls do not follow a standardized set of policies, and therefore, improvement on the implementation and documentation is needed (personal communication, February 27, 2019).

Conducting discharge phone calls contributes to addressing readmission and post-discharge issues in such a way that it serves as an avenue for effective communication. Follow-up processes via telephone calls are proven to be an effective way of sharing communication, giving guidance or advice, and providing excellent post-discharge care (Lushaj et al., 2016). Post-discharge phone calls also help re-iterate discharge instructions, achieve positive clinical outcomes, ease anxiety experienced by patients, reduce complications, and emphasize the importance of patient self-care (Shupe, 2014). One study recommended that the themes used when doing a telephone follow-up should cover information on cardiovascular illness, possible complications due to the operation, changes in social interactions and way of life, and psychosocial and emotional assessment (Furuya et al., 2013).

Problem Statement

Hospital readmissions are noted to have a tremendous financial impact on the healthcare system of the United States (Hannan et al., 2011). Ongoing efforts are carried out to decrease the rates of preventable hospital readmission, which could then result in better patient outcomes and decrease in hospital finances and healthcare costs (Price, Romeiser, Gnerre, Shroyer, & Rosengart, 2013). Costs attributed to hospital readmissions vary depending on the disease or reason for readmission. Cardiac-related diseases are an example of the common diseases found

in readmitted patients. According to Iribarne et al. (2014), cardiac surgery is one of the most expensive surgical procedures; it costs approximately \$100,000 per operation.

One means of mitigating the increased number of hospital readmissions is through conducting post-discharge phone calls. However, issues and problems, such as being unable to get prescriptions from pharmacies or having problems with treating the post-surgical wound, arise when these discharge phone calls lack specificity, are not carried out within a specified timeframe, and do not tackle essential patient needs. It is especially important to improve discharge phone calls because studies have reported that phone call questions that are specific for every patient population can help improve patient satisfaction and reduce readmission rates (Shupe, 2014).

The key question that drives resolution of the focus problem of this study is the following: Is there an association between discharge phone calls and 30-day readmission rates for post-operative cardiac surgery patients?

Aims & Objectives

The study aims to evaluate the association of discharge phone call and 30-day readmission rates for post-operative cardiac surgery patients who received the call versus those who did not receive the call.

- Discuss with the stakeholders (chief medical officer, patient care director, nurses, and the medical director of the CT surgery step-down unit) the importance and the purpose of the project.
- Gather the administrative data and document it in the Excel spreadsheet.
- Analyze the collected data.

- Evaluate the association of the nursing discharge phone call in 30-day readmission rates in post-operative cardiac surgery patients.

Review of Literature

The databases utilized in the systematic search of the literature were CINAHL, PubMed, Medline, Scopus, and Joanna Briggs Institute (JBI). JBI is one of the renowned databases that provide evidence-based information and offers tools that aid healthcare professionals in delivering the best evidence-based practice. ProQuest was explored to search for grey literature, but no article was related to the clinical question. A medical librarian was consulted in developing the Medical Subject Heading (MeSH) search terms. The search strategy was categorized into three groups: cardiac patient, discharge, and telephone. The keywords used in the search strategies were “patient discharge,” “continuity of care,” “telephone,” “discharge phone call,” “follow-up phone call,” “phone call,” “post-operative patient,” and “postoperative care.” The limits used in the strategy were English literature and a time frame of 10 years. The results were narrowed down to 41, and twelve articles met the selection criteria. The selection of the research articles was based and focused on the clinical question. The following factors were considered in the selection of the research articles: sample size, methods used in the study, the target population of the study, time frames used in the study, and results and limitations of the study. The research studies were appraised individually for evidence level and quality using the Johns Hopkins Nursing Evidenced-Based Practice tool. The research articles are organized in a table of evidence (Appendix A). Most of the literature selected was level I and level V research studies.

Purpose of the discharge phone call

The research studies indicate that the primary purpose of conducting a discharge phone call is to look for possible problems that can occur after a patient was sent home from the hospital (Bahr et al., 2014; Bath et al., 2019; Harrison, Auerbach, Quinn, Kynoch, & Mourad, 2014; Miller & Schaper, 2015; Soong et al., 2014; Tang, Fujimoto, & Karliner, 2014). Through follow-up phone calls, healthcare providers become informed about patients' conditions, can assess patients' needs, and can give patients guidance based on the patients' responses to the questionnaires (Miller & Schaper, 2015). The research studies also indicate that if the possibility of health or social issues occur after discharge, a discharge phone call interventionist will give advice to patients about what to do in order to prevent readmission (Bath et al., 2019; Biese et al., 2018; Soong et al., 2014; Tang et al., 2014). Aside from the interactions between patients and healthcare providers, discharge phone calls also serve as a platform for interactions among healthcare professionals. One study established a workflow to address issues or problems that are identified by discharge phone calls (Tang et al., 2014). Through the workflow, nurses were able to coordinate systematically with other members of the collaborative team, such as social workers and medical doctors. In one study, pharmacists did the follow-up phone call, which highlights the importance of interactions between healthcare professionals (Sanchez, Douglass, & Mancuso, 2015). The pharmacists who conducted the follow-up phone call addressed issues about or discrepancies in medications; however, about the clinical judgment, the pharmacists sought advice from primary care providers such as physicians and nurses (Sanchez, Douglass, & Mancuso, 2015). A systematic review that was done by Bahr et al. (2014) found that discharge phone calls significantly improved adherence to scheduled follow-up visits. In summary, the

goals of the research studies helped conclude that discharge phone calls can help bridge the gap as patients transition from hospital to home.

Attributes of the discharge phone call

In all twelve research studies selected, discharge phone calls were initiated within 24 hours after patients were discharged from the hospital to home (Bahr et al., 2014; Bath et al., 2019; Biese et al., 2018; Furuya et al., 2013; Hamar et al., 2018; Harrison et al., 2014; Meek, Williams, & Unterschuetz, 2018; Miller & Schaper, 2015; Sanchez et al., 2015; Soong et al., 2014; Tang et al., 2014), and attempts to contact patients persisted for up to a week after discharge (Bath et al., 2019; Biese et al., 2018; Harrison et al., 2014; Miller & Schaper, 2015; Sanchez et al., 2015; Shupe, 2014; Soong et al., 2014; Tang et al., 2014). In one study, discharge phone calls were done within two weeks after hospital discharge (Hamar et al., 2018), and one systematic review implied that the time frame of conducting the intervention could vary from six weeks to eight months (Furuya et al., 2013). The minimum number of attempts to contact patients was two to three times (Harrison et al., 2014; Miller & Schaper, 2015; Sanchez et al., 2015; Tang et al., 2014), and the maximum number of attempts was five (Biese et al., 2018; Soong et al., 2014). Five studies evaluated the duration of discharge phone calls. The length typically ranges from 10 to 24 minutes (Bahr et al., 2014; Biese et al., 2018; Miller & Schaper, 2015; Sanchez et al., 2015). In another study, the duration ranges from 15 to 60 minutes (Furuya et al., 2013).

In most of the selected studies, registered nurses conducted the discharge phone calls (Bahr et al., 2014; Bath et al., 2019; Biese et al., 2018; Furuya et al., 2013; Harrison et al., 2014; Miller & Schaper, 2015; Tang et al., 2014). Some of the studies used specialty nurses to conduct the phone calls, such as a Trauma Certified Nurse Specialist (CNS) (Bath et al., 2019) or a

Clinical Nurse Leader (CNL). A CNL is a nurse with a master's degree who is equipped with leadership skills and capabilities at the microsystem level (Miller & Schaper, 2015). Bahr et al. (2014) revealed that nurses who do not have a patient assignment are more likely to take on the responsibility of calling all the discharge patients who are listed for follow-up. Out of the twelve studies selected, two studies differed from the rest of the studies in terms of the healthcare professional assigned to conduct the discharge phone calls. In one of the studies, pharmacists conducted the discharge phone calls (Sanchez et al., 2015), and in the other one, patient navigators were selected (Soong et al., 2014).

One of the important factors in conducting discharge phone calls is that the interventionist should have received adequate training before doing the intervention. Through proper training, interventionists are taught to deliver discharge phone calls efficiently and with consistency, and they can enhance their knowledge about the purpose and goals of the discharge phone calls (Biese et al., 2018; Furuya et al., 2013; Hamar et al., 2018; Miller & Schaper, 2015; Tang et al., 2014). Meek, Williams & Unterschuetz (2018) identified that if interventionists are not adequately trained to deliver the discharge phone calls, the intervention may not be implemented in an orderly manner and may become ineffective, thereby resulting in decreased patient satisfaction. In one study, nurses who were assigned to do discharge phone calls were trained for telephonic medicine (Biese et al., 2018). Another article reported that before conducting the study, the research team held a training session for the nurses. During this training, the nurses would practice how to deliver the questions included in the discharge phone calls (Miller & Schaper, 2015). Also, a study that was done by Tang et al. (2014) indicated that through a training session, nurses were able to discuss techniques on how to solve problems or issues that would arise. Shupe (2014) recommended that leaders should take advantage of using

the skills lab so that nurses who are doing the call can be evaluated and validated. This is to ensure that healthcare providers are giving the best care possible. On the whole, education plays a vital role in this intervention. Through education and validation, the team can identify which part of the intervention needs to be polished.

Additional aspects of discharge phone calls are frequency and duration. Furuya et al. (2013) suggested that nurses conducting more frequent and longer phone calls may help the intervention become successful. The literature has indicated that patients reached within a week after discharge showed success rates compared to patients reached after 30 days (Soong et al., 2014). Shupe (2014) suggested that high-risk patient populations should be contacted in a series of calls. For example, in Green Memorial Hospital, heart failure patients received a series of calls after discharge. An 18.5% reduction in readmission rates resulted, following a more frequent series of calls. This hospital ranked as having the second lowest readmission rate for heart failure nationwide (Shupe, 2014).

In conclusion, reaching out to patients after discharge is essential because the post-discharge period is a crucial time for patients; this is when they are most vulnerable and need further attention (Bath et al., 2019). This is also a period where complications and risks arise. One of the research studies noted that in post-operative cardiac surgery patients, 75% of the total cases of complications or problems occurred within 14 days post-discharge (Furuya et al., 2013). Most of the studies have shown that patients who received discharge phone calls were at a lower risk of being readmitted to the hospital. One of the critical factors that help discharge phone calls become successful is when interventionists are given adequate training. This ensures consistency of the quality of phone calls and enhances interventionists' knowledge about the purpose and

goals of the discharge phone call (Biese et al., 2018; Hamar et al., 2018; Miller & Schaper, 2015; Tang et al., 2014).

Telephone script

Several studies utilized a scripted phone call when conducting the intervention (Biese et al., 2018; Harrison et al., 2014; Soong et al., 2014; Tang et al., 2014). In the study conducted by Bath et al. (2019), the conversation started with the question “How have you been doing since you have been home?” In most of the discharge phone calls, the common topics discussed were medications, appointments, and issues that occurred since the patient has been home from the hospital (Bahr et al., 2014; Bath et al., 2019; Biese et al., 2018; Furuya et al., 2013; Hamar et al., 2018; Harrison et al., 2014; Miller & Schaper, 2015; Sanchez et al., 2015; Soong et al., 2014; Tang et al., 2014). In three studies, pain issues and bowel problems that happened after discharge were discussed in the phone calls (Bath et al., 2019; Furuya et al., 2013; Miller & Schaper, 2015). Most of the studies also took the phone calls as an opportunity to re-enforce education to discharged patients, such as teaching them how to identify and monitor signs and symptoms of possible problems (Bath et al., 2019; Biese et al., 2018; Harrison et al., 2014; Sanchez et al., 2015). Self-care knowledge is also re-enforced during discharge phone calls (Bahr et al., 2014). Interventionists who conduct the phone call should make sure that the patient understands the discharge instructions (Hamar et al., 2018; Soong et al., 2014). In one study (Sanchez et al., 2015), pharmacists did the intervention. In this study, patient status, consistency between the hospital and home medication, and follow-up visit schedules were evaluated and discussed via phone calls. Pharmacists also asked patients about medication adherence and any signs of side effects from the medications (Sanchez et al., 2015). In one systematic review that was done in a cardiac population, patients were asked about their wounds, if they experience any chest pain, if

they have problems with incision care, and if they already made an appointment with a cardiac rehabilitation center (Furuya et al., 2013).

Project Re-Engineered Discharge (RED) is one of the interventions developed by the Boston Medical Center. RED is a protocol primarily involving nurses and pharmacists that was proven to significantly decrease rehospitalization cases (Sanchez et al., 2015). Among the research studies selected, two studies adapted the project RED phone script in implementing the intervention (Harrison et al., 2014; Sanchez et al., 2015). The research that was done by Sanchez et al. (2015) revealed that there was a significant reduction in readmissions for patients who participated in the intervention compared to patients who were not contacted (0.227 vs. 0.519, $p < 0.001$). In the study that was done by Harrison et al. (2014), patients who participated in the follow-up phone call also had a significantly lower readmission rate (5.8%) compared to patients who did not receive the phone call (8.6%).

Therefore, conducting discharge phone calls has a higher probability of reducing readmission rates. When discharge phone call scripts contain appropriate topics and specific questions, nurses can accommodate the needs of the patients and refer them to designated collaborative medical team members.

Transition of care

One crucial aspect that should be addressed once patients are discharged is the transition of care from hospital to home. Nurses can aid patients in this process by conducting follow-up phone calls. Two studies conveyed that using an algorithm when conducting phone calls can be beneficial to the nurses because it could help them navigate options on where to refer the patients when issues arise (Harrison et al., 2014; Miller & Schaper, 2015). Bath et al. (2019) reported that when nurses encounter problems, such as cases where patients are unable to make an

appointment, they are able to guide patients and direct them to appropriate healthcare professionals or health departments. Tang et al. (2014) also reported that nurses are able to help patients with medication issues during the transition of care by contacting a home care agency that could send a nurse to the patient's house if needed. Follow-up phone calls play a vital role in this scenario in that these serve as a means of communication between nurses and patients (Soong et al., 2014). In conclusion, the scenarios depicted above are examples of issues that patients encounter during the transition of care and that needs to be addressed immediately, without requiring patients to go to the hospital.

Outcomes

Among the research studies selected, two main findings are contrasting: discharge phone calls reduce readmission rates versus discharge phone calls have no effect in readmission rates. Bahr et al. (2014) indicated that evidence has shown that higher follow-up rates were achieved through discharge phone calls. The researchers also recommended that future studies should include high-risk patients, as they are more prone to readmission. Future studies should also be target-specific, which means that discharge phone calls should be directed to specific patient populations or age groups. In the study that was done by Bath et al. (2019), readmissions decreased by approximately 50%, thereby increasing financial savings. A systematic review that was done by Furuya et al. (2013) stated that discharge phone calls have a positive effect on patients. There was a significant improvement in the quality of life, and pain and anxiety levels were reduced. Also, patients who received phone calls were expressively knowledgeable because of re-enforcement of discharge teaching. The researchers suggested that the themes that should be included in the phone calls are "knowledge about cardiovascular illness; post-operative complications; self-care, including behavioral and lifestyle changes; and psychosocial evaluation

and emotional support” (Furuya et al., 2013). On the other hand, Biese et al. (2018) reported that scripted telephone calls have no effect in reducing emergency room visits, readmission rate, or mortality rates within thirty days. The recommendations of the researchers for future studies is to select which groups would benefit the most in achieving positive health outcomes.

There are some inconsistencies in the research studies. One of these is the timing of patient calls. The time frames used in the studies vary from 24 hours to seven days after discharge. One of the studies contacted the patient after 30 days, which resulted in poor outcomes. Another inconsistency noted is that not all of the studies trained or educated the interventionists who carried out the discharge phone calls. The lack of training can affect the delivery and implementation of discharge phone calls. The major limitation of the articles is that there are multiple factors that affect the generalizability of the findings of the studies. There were two studies that were done outside the United States, the target populations that were addressed in the articles are not cardiac surgery patients, and some of the articles were done at a single site. It is identified in the synthesis of literature that there is a gap between the providers and the patients when the patient is unable to answer the discharge phone call.

In summary, discharge phone calls can have a significant effect in reducing readmission rates (Bath et al., 2019; Hamar et al., 2018; Harrison et al., 2014; Miller & Schaper, 2015; Sanchez et al., 2015). Telephone follow-up serves an essential intervention in patients’ health. Through discharge phone calls, nurses, doctors, and pharmacists can help patients in transitioning care from hospital to home. Also, through a thorough follow-up, early symptoms and issues can be detected and be fixed or prevented from getting worse. Shupe (2014) recommended that in conducting discharge phone calls, the questions should be specific to a patient population. The studies also further recommend targeting high-risk patients and to use

skills labs in reinforcing interventionists' training to ensure efficiency (Shupe, 2014). The results of the research studies will serve as a foundation for conducting this DNP project. The limitations and recommendations discussed above will serve as guides in structuring this project. Highlighting the limitations of the studies will aid in improving the DNP project because aspects that need to be adjusted and developed are identified.

Conceptual Framework

The Plan-Do-Study-Act model (Appendix B), or also known as the PDSA, is one of the commonly used methods for quality improvement in the healthcare industry (White, Dudley-Brown, & Terhaar, 2016). This method was established by Walter Shewhart and Edward Deming (Morelli, 2016). This approach is well recognized in the healthcare industry because it utilizes a series of logical processes that support continuous modification and improvement of existing plans (White et al., 2016). The synthesis of the selected research articles will aid in developing interventions to achieve resolution of the target goals. The purpose of utilizing this approach is for it to serve as the foundation and guide in assessing the association between discharge phone calls and 30-day readmission rates.

The PDSA consists of four stages. In the planning stage, the researcher presents the goals of the study (Taylor et al., 2014). In this stage, the aims, the proposed change, and the target outcome are stated. In this DNP project, the goal is to assess the association between discharge phone calls and 30-day readmission rates. This is also the part of the PDSA cycle where the researcher will discuss with the stakeholders the benefits and potential outcomes of the project.

The next step is the Do stage in which the change is being executed (Taylor et al., 2014). In this stage, the PI will audit administrative data through retrospective chart review to determine if discharge phone calls have an effect in reducing 30-day readmission rates. The researcher will

use an instrument to gather the data. The results will be documented in an Excel spreadsheet for data analysis. This is then followed by the Study stage. In the Study stage, analysis of the results of the intervention occurs (Taylor et al., 2014). Here, the results of the study will be evaluated for statistical significance. The researcher will compare the results to know if there is an association between discharge phone calls and reduced readmission rates. All of the results gathered from the study will be put in a summary for future recommendation of practice change. The final stage in the PDSA is the Act stage. In this stage, the results of the study will determine if the intervention will be put into action, rejected, or repeated (Taylor et al., 2014). The results of the study will be disseminated to the healthcare team in the cardiothoracic surgery step-down unit. The researcher will provide education to clinical nurses regarding how beneficial discharge phone calls are to cardiac surgery patients. Also, results of the study will be presented to the chief medical officer of the target site for any recommended practice change or policy. The outcome of the study will also pave the way for implementation of the intervention into the future standard of care.

Methodology

Project Design

The pilot project design used a retrospective chart review.

Setting

The project was conducted in a cardiothoracic surgery step-down unit of a 745-bed hospital located in the tri-state area. The unit accommodates different kinds of post-cardiac surgery procedures such as Coronary Artery Bypass Graft (CABG), heart valve surgeries, heart transplants, and aorta surgeries.

Study Population

This quality improvement project included a convenience sample of post-operative cardiac surgery patients who are discharged to home. The inclusion criteria consisted of the following: 18 years old and older; patients who are discharged to home or to a skilled nursing facility, with discharge phone call initiated; all genders and ethnic background; patients who have undergone cardiac surgery. The exclusion criteria were patients who were not under a cardiothoracic service and did not undergo open heart surgery, and transplant recipients. Raosoft, Inc. (2004) was utilized to determine the target sample size. By having a margin error of 5% and a confidence level of 95%, the population size was 180 and the response distribution is 50%. According to Raosoft, with the confidence level of 95%, the recommended sample size for this project is 123.

Subject Recruitment

Subject recruitment was not carried out in this retrospective study. Instead, subjects were selected using the inclusion criteria indicated above. Subjects who were not included in the study will not be used.

Consent Procedure

Consent procedure was not carried out, as this study only involved a retrospective chart review.

Risks/Harms/Ethics

Subjects who were included in the study would not receive direct risks or benefits. Study interventions and direct contact to subjects were not carried out in this project. Information obtained from subjects remained confidential and would not be included in publications or any material outside this study. The information that was collected in the study, such as the medical record number, type of surgery, age, and ethnic background, were assigned to a unique number.

The number that was assigned directly to the information was used to review the data; therefore, collected information was not directly connected to subject personal information. Only the PI has access to the information of the subjects. Potential risks of the study include unauthorized disclosure of subject information or compromised privacy of subjects. However, through proper data handling, subject information was protected, and data collected from the study was treated with confidentiality.

Subject Costs & Compensation

No costs were incurred by subjects who were included in this study. Likewise, subjects did not receive compensation for participating in the study.

Study Intervention

The study intervention was a retrospective chart review regarding discharge phone calls. The study looked at the administrative data of discharge phone calls for the whole month of January 2019 and looked at the patients who received and did not receive a discharge phone call. The PI investigated if patients discharged in the month of January and received a call were readmitted after 30 days of discharge. This information compared if a discharge phone call has an association with the 30-day readmission rates in the cardiothoracic unit. Demographics, such as age, gender, and ethnicity, was retrieved from the electronic medical record (EMR), and this information was de-identified. The PI used a data collection instrument and a data decoder, which is described in Appendix C and Appendix D.

Outcomes to be Measured

The project measured readmission rates for patients who received discharge phone calls after cardiac surgery. Through discharge phone calls, early issues and problems will be detected,

and patient readmission can be prevented. The goal of this study was to assess the association of discharge phone calls in reducing 30-day readmission rates.

Project Timeline

The DNP project planning and writing finished in September 2019. The project was presented to the DNP chairperson and the team member. The IRB approval date was December 4, 2019. The proposal was forwarded to Rutgers IRB and was approved on December 23, 2019. The implementation was started on January 24, 2019. The final writing was done in March 2020. The next step will be obtaining approval from the DNP chairperson and the team members to present a PowerPoint and poster presentation. The presentation of the final DNP project will happen in April 2020, and the graduation will be in May 2020 (see Appendix E).

Resources Needed

Any expenses and costs attributed to this project will be shouldered by the PI. There will be no cost to the site. The budget for this quality improvement project was \$50.00 (Appendix F). There were no expenses, since Microsoft Excel was used for the analysis of the data. Dr. Baruch assisted in getting the administrative data for the study.

Evaluation Plan and Data Analysis

The co-PI determined what to recommend for further future research. The PI used the Plan-Do-Study-Act (PDSA) model to evaluate the project (Appendix B). Patient demographics and data collected were recorded on an Excel spreadsheet. Microsoft Excel was used for the analysis of the data. Descriptive statistics was used for analysis of the demographic data. Chi-square analysis was used to compare the data between patients who received the call and patients who did not receive the call. Fisher exact test was also used for additional verification.

Maintenance and Security

The data that was collected was stored in an encrypted USB device that is password protected. The subjects' pertinent information was substituted with a unique number to de-identify the subject. The data evaluation was managed by the PI. The data that was collected was de-identified to protect the privacy of the subjects. Once de-identification is done, the collected data was encoded in an Excel spreadsheet. Following the guidelines of Rutgers University, after the project has been concluded, the documents from the IRB, hard copy consent forms, collected data, and the final writing of the project will be kept at Rutgers University and discarded after six years.

Results

Descriptive Statistics for the Sample

The total study sample was $N=80$. Ages ranged from 18-40 years (7.5%) to 81-95 years (5.0%) with the median age being $Mdn = 70.50$ years. There were more men in the sample (65.0%) than women (35.0%). The most common racial/ethnic background was White/Caucasian (46.3%) and for 35.0%, the racial/ethnic background of the patient was unknown. The most common procedures were coronary artery bypass graft (CABG) (28.8%) or heart valve surgery (36.3%) or both (7.5%), and 20.1% were other type of cardiac surgery. Most patients (95.0%) were discharged to home and 5% were discharged to a skilled nursing facility. 90% of the cardiac surgery patients received a discharge phone call and 5% did not receive a phone call. About half (53.8%) had a length of stay within seven days and 46.3% had a length of stay of more of than 10 days. Five (6.3%) were readmitted within 30 days and 93.8% were not readmitted within 30 days (see Appendix F). For the readmission diagnosis of the 5 patients who were readmitted, one of the patients was readmitted for sternal wound infection, one patient was

diagnosed with abdominal retroperitoneum for readmission, one patient was readmitted for fever, and 2 patients had anemia.

Answering the Clinical Question

The key question that drove resolution of the focus problem of this study was the following: Is there an association between discharge phone calls and 30-day readmission rates for post-operative cardiac surgery patients? To answer that question, Appendix G displays the cross-tabulation between having received a discharge phone call and readmission within 30 days. 67 patients (93.1%) received a call but were not readmitted within 30 days. However, 5 patients (6.9%) received a call and were readmitted within 30 days. The chi-square value was not significant, $\chi^2 (1, N = 80) = 0.59, p = .44$. Because one of the four cells had zero patients, a Fisher's exact test was also used to provide additional verification. That probability was also not significant ($p = 1.00$) (see Table 2).

Discussion

The study design was to determine the association of discharge phone calls with 30-day readmission rates in patients who have undergone cardiac surgery. The study used archival data from 80 patients through a retrospective chart review. The data was taken from January 1, 2019 until January 31, 2019. Based on the statistical analysis discussed in the Results section, the study found out that the probability of the association of the discharge phone call with 30-day readmission rates was not significant.

Institutions that do not utilize follow up discharge phone calls to patients who are discharged to home have a higher rate of readmissions (8.6%) compared to when patients receive a discharge phone call (5.8%) (Harrison et al, 2014). Since 2012, the CMS has implemented the Hospital Readmissions Reduction Program (HRRP). This program "is a Medicare value-based

purchasing program that reduces payments to hospitals with excess readmissions. The program supports the national goal of improving healthcare for Americans by linking payment to the quality of hospital care” (CMS, 2020). This means that increased readmission rates in institutions or hospitals pose a financial risk. According to Section 3025 of the Affordable Care Act, effective October 1, 2012, the Secretary of the Department of Health is required to implement HRRP and to cut down payments to Inpatient Prospective Payment System (IPPS) hospitals with increased number of readmissions. The HRRP applies to the following conditions: Acute Myocardial Infarction (AMI); Chronic Obstructive Pulmonary Disease (COPD); Heart Failure (HF); Pneumonia; Coronary Artery Bypass Graft (CABG) Surgery; Elective Primary Total Hip Arthroplasty and/or Total Knee Arthroplasty (THA/TKA). This implies that these conditions or other related illnesses make up majority of readmission cases in hospitals. Hence, healthcare providers should be driven to help improve processes in order to avoid patient readmissions that could result to decreased financial capacity of hospitals. In this study, the focus was post-operative cardiac surgery patients, and it was found that the number of readmissions for these patients was 5 for one month. Shah et al (2019) stated that the average hospital cost for a patient readmitted after cardiac surgery is \$13,500. Based on the results of this study, this amounts to almost \$70,000 per month. According to the US Bureau of Labor Statistics, the median pay for a registered nurse is \$71,730 per year. If institutions will hire a registered nurse to monitor patients who have been discharged to home through a follow-up phone call, it will help save hospital costs by more than tenfold. The return of investment of hiring a nurse and implementing post-discharge monitoring can bring a significant impact in hospital revenue. This still holds true even if only half of the readmissions occurred, because hospital costs due to readmissions are very

expensive. This proves that hiring nurses and investing in manpower can make significant changes in patient care.

In the healthcare system in the United States, much effort has been dedicated to finding ways to reduce preventable hospital readmission, most especially readmissions concerning cardiac surgery patients. This is because much cost is attributed to cardiac surgery hospitalization. Cardiac surgery is listed as one of the most expensive surgical procedure with an average of \$100,000 or more per patient (Price, Romeiser, Gnerre, Shroyer, & Rosengart, 2013). Evidence has shown that institutions that have implemented the Project RED by the AHRQ have a positive outcome in reducing readmission rates (Harrison et al., 2014; Sanchez et al., 2015). Reducing readmission rates saves costs, which can be invested in other areas.

The main purpose of discharge phone calls is to improve quality of care, promote health, and reduce costs by helping patients with chronic diseases follow the plan of care set by their respective providers, to receive appropriate standard of care, and to promote awareness and self-management of their illness (P. L. Harrison et al., 2011). A follow-up telephone call is a simple method to connect with patients following discharge to review and reinforce discharge plans (Soong et al., 2014). Evidence has shown that in cases where patients received a phone call after discharge, there was a positive impact in reducing readmission rates and improving the patient experience (Shupe, 2014). Schuller, Lin, Gamm & Edwardson (2015) stated that the impact of discharge phone calls into the patient's transitional period was improved knowledge in regards to discharge instructions that comprise medication education, improved adherence to medical appointments, and an opportunity for patients to ask questions about their condition and the care they should receive. All these factors contribute to improved patient care and reduced

readmission rates. Hospitals also benefit from the positive outcomes from discharge phone calls through improved patient satisfaction and reduced costs.

This project has a policy implication in an inpatient and outpatient institution. The project has an opportunity to let the patient be in charge of their health with the help of the discharge phone call. The health care providers serve as their guide through reinforcement of education and support if they have any questions. One of the most important frameworks that were initiated by the Institute of Medicine (IOM) includes six aims for the healthcare system. These are “safe, effective, patient centered, timely, efficient, and equitable” (AHRQ, 2018). This study, which proposes evidence-based practice, is based on these aims. As such, this study emphasizes the importance of implementation of strategic ways to improve quality of care to patients.

Study Limitations

One of the limitations of the study is its small sample size. Because of the small sample size, it was difficult to obtain significant correlations with the obtained data. Small sample size can also lead to difficulties in data interpretation and less conclusive results. Another limitation of the study is lack of available data. The month of January in the cardiothoracic surgery unit was considered as a low census month. Most of the patients were out of service and were not included in the study. Also, the retrospective chart review only looked for one month of discharge phone calls. Clearer and more conclusive data would have been obtained if the study involved a longer time period of discharge phone call administration.

Recommendation for Practice

The result of the study showed that there is no association between discharge phone call and 30-day readmission rates. However, as healthcare providers, we should continue to strive more in order to give our patients the best evidenced-based practice and improved quality care.

One recommendation that I would suggest is that there should be a policy in place in the institution with regard to implementation of discharge phone calls. The policy will be designed as an outline for the nurses to follow a specific guideline. It is also beneficial if there is a policy to ensure staff compliance and to ensure implementation of discharge phone call as part of standard practice. Another suggestion is that the discharge phone call should be scripted (Appendix K) as what the AHRQ recommended in the RED toolkit. The script should investigate the patients' "health status, medicines, appointments, home services, and plan if a problem arises." The AHRQ phone script can be found in Appendix I and the approval letter from the AHRQ in Appendix J. As Shupe (2014) recommended, phone call scripts should be standardized per unit and it should be focused on the patient populations.

Conclusion

The high rates of readmission are one of the factors of increased spending in healthcare, and therefore, targeting this issue can achieve the highest quality patient care and improve healthcare costs (Iribarne et al., 2014). The result of the study indicated that there is no association between discharge phone calls and readmission rates. Possible factors for this outcome, as discussed in the Study Limitations section, are the small sample size and short period of the intervention. Hence, further research is needed and recommended. The goal of reducing rehospitalizations is promising especially for policymakers, as this goal helps improve quality of care and reduce healthcare costs, but much work has to be done to achieve this goal (Hansen, Young, Hinami, Leung, and William, 2011). Although proven otherwise by the results of this study, discharge phone calls remain helpful in bridging the gap of the patient's transition from hospital to home, and these will help in improving communication between the patient and the healthcare provider. One important finding of this study is that it opens up opportunities for

improvement in multiple aspects of care, whether involving a bigger sample size, a longer period of data collected, or a different patient population. The findings of this study will be disseminated through PowerPoint and poster presentations to the faculty and students of Rutgers University. Also, the results of the study will be disseminated to the hospital site by the end of the project through monthly meetings and presentations.

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Appendices

Appendix A: Table of Evidence

Article #	Author & Date	Evidence Type	Sample, Sample Size & Setting	Study findings that help answer the EBP question	Limitations	Evidence Level & Quality
1	Bahr, Solverson, Schlidt, Hack, Smith, & Ryan (2014).	Systematic Review	N = 19 Research Studies 10 – RCT 4 – Quasi-experimental 4 – Descriptive 1 – Prospective single group cohort	19 articles were synthesized to determine the impact of post-discharge phone calls. The review indicated that the outcome of the telephone call varies from positive and negative results. The researchers recommended that forthcoming research study should target patients who are at high risk to be readmitted.	Three databases were used for the research articles. Grey literature was not utilized.	Level I, A, High Quality
2	Bath, Freeman, Salamoun, Harvey, Wright, Hamili, Lollar, Bower, & Collier (2019).	A Retrospective quality improvement study	N = 9117 4,470 – Preintervention Group 4,647 – Intervention Group	The study developed a program called callback wherein a clinical nurse specialist contacted trauma patients after discharge. Call attempts were made within 72-96 hours after hospital discharge within 2 weeks. The phone call focused on appointments, medication, pain, and dissects patient issues. The study indicated that the callback program significantly reduced readmission rates (0.81% p = 0.4).	Only one third of the discharge patients were reached through phone call after release in the hospital. Single site study.	Level V, A, High Quality
3	Biese, Busby-Whitehead, Cai, Stearns, Roberts, Mihas,	Randomized Controlled Trial	N = 2,000 Academic Medical Center in the Southeast United States	The intervention that was used in this study is scripted telephone call by the nurse to contact patients after hospital discharge	Single site study. Large sample size. Self-reporting There is a bias in selecting the	Level I, A, High Quality

Article #	Author & Date	Evidence Type	Sample, Sample Size & Setting	Study findings that help answer the EBP question	Limitations	Evidence Level & Quality
	Emmett, Zhou, Farmer, & Kizer (2018).			from the Emergency Department (ED). The study revealed that scripted telephone call has no effect in reducing ED visit, readmission rate, or mortality rates within thirty days.	sample who participated in the study.	
4	Furuya, Mata, Veras, Appoloni, Dantas, Renata, Silveira, & Rossi (2013).	Systematic Review	N = 7 RCT studies	Systematic review to identify and synthesize the results of conducting a telephone follow-up. Results indicated that telephone follow-up helps achieve improvements on health-related quality of life and physical functioning and helps lessen pain, anxiety, and mood symptoms.	Grey literature was not utilized.	Level I, A, High Quality
5	Hamar, Coberley, Pope, Cottrill, Verrall, Larkin, & Rula (2018).	Quasi-experimental retrospective design	N = 451 146 – Treatment group 305 – comparison Australia	Telephone follow-up was utilized in this study after hospital discharge to reduce readmission rates for patients who were diagnosed with chronic illness. The sample was divided into two groups, which are the treatment and comparison groups. The patients who participated in the intervention belonged to the treatment group. The patients who did not participate in the intervention fit into the comparison group. The result of the study indicated that the treatment group showed a lower incidence of readmission rate by	The selection of the sample was not randomized; selection bias may have been introduced.	Level II, A, High Quality

Article #	Author & Date	Evidence Type	Sample, Sample Size & Setting	Study findings that help answer the EBP question	Limitations	Evidence Level & Quality
				29% compared to the comparison group. The chance of treatment group to be readmitted was reduced to 25% compared to the comparison group.		
6	Harrison, Auerbach, Quinn, Kynoch, & Mourad (2014).	Retrospective observational study	N = 5,507  San Francisco, CA	Scripted nursing discharge phone call initiated for patients discharged after 72 hours from hospital to home. Patients who received the discharge phone call had a significantly reduced readmission rate (5.8%) compared to the patients who did not receive the phone call (8.6%).	Single site observational study. Therefore, there is a limitation in generalizability of the finding. The study is not a randomized intervention.	Level III, A, High Quality
7	Miller & Schaper (2015).	Quality Improvement Study	N = 489 325-bed teaching hospital. Gundersen Health System.	Discharge phone calls were initiated after 24 to 72 hours of discharge from the hospital by the clinical nurse leader. Structured telephone call was used in this intervention. The results indicated that patients who receive the discharge phone call within 7 days of release from the hospital are significantly less likely to be readmitted ($P < .05$), and the number for patients who were discharge within 30 days were also reduced ($P = .053$).	The clinical nurse leader was having difficulty in reaching high-risk population. Time was a factor in doing discharge phone calls.	Level V, A, High Quality
8	Meek, Williams, & Unterschuetz (2018)	Expert Opinion	N/A	The article suggested that conducting post-discharge calls through well-trained third-	Not mentioned in the article.	Level V, A, High Quality

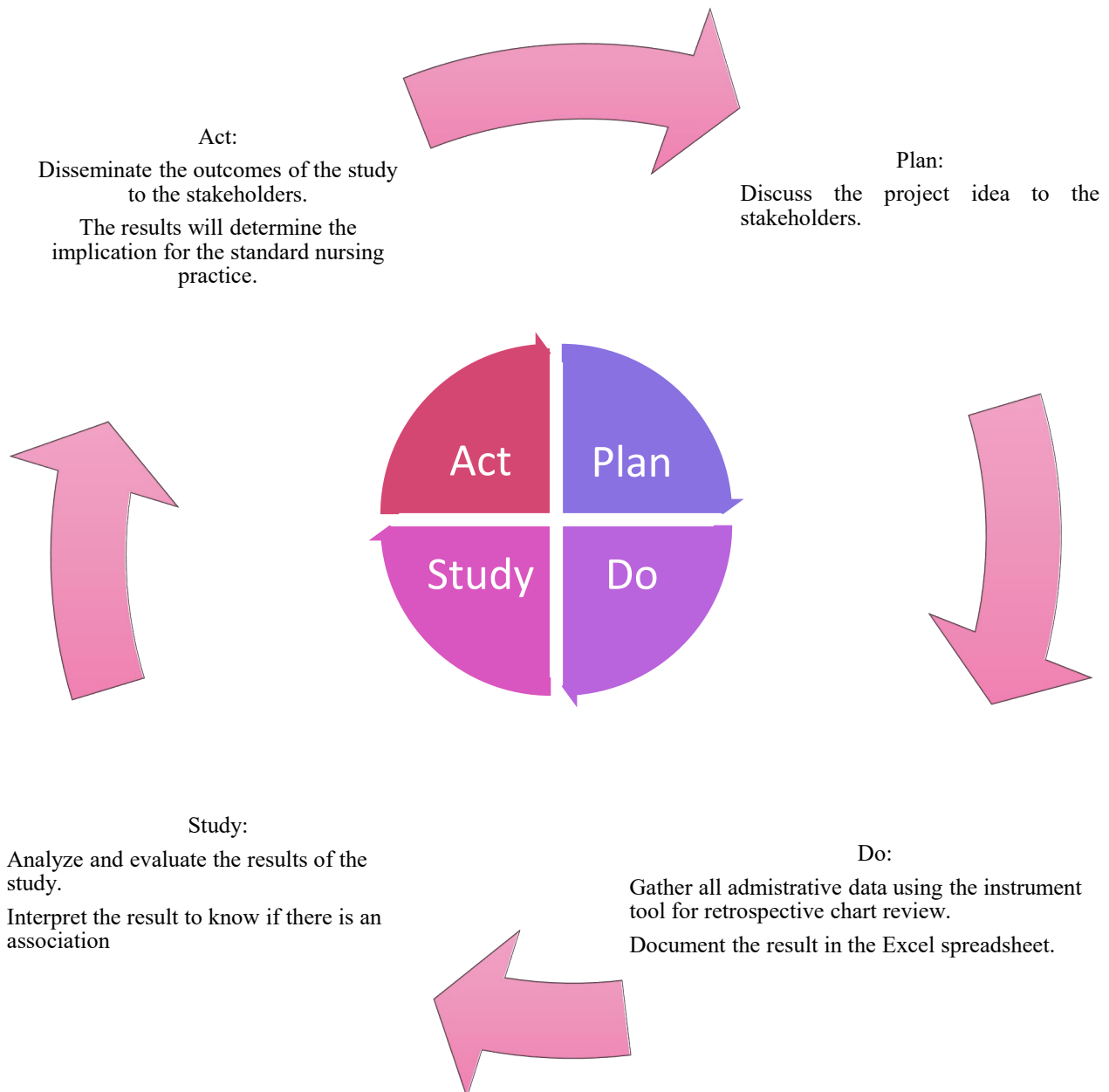
Article #	Author & Date	Evidence Type	Sample, Sample Size & Setting	Study findings that help answer the EBP question	Limitations	Evidence Level & Quality
				party personnel can aid in streamlining communication, reducing hospital costs, and improving patient satisfaction and experience.		
9	Sanchez, Douglas, & Mancuso (2015)	Retrospective Chart Review	<p>N = 401</p> <p>277 – received intervention</p> <p>124 – did not receive intervention</p> <p> Boston, Massachusetts.</p>	<p>Discharge phone call was done by the pharmacist after the patient was discharged from the hospital. Phone calls were made within 48 to 96 hours following patient discharge to home. Topics that were discussed in the discharge phone calls were current patients' status, medications, appointments, and instructions if issues happen. The average time for the intervention was 22 minutes. The study revealed that there was a significant reduction of readmission for patients who participated in the intervention compared to patients who were not contacted (0.227 vs 0.519. $p < 0.001$).</p>	Variability of documentation because different pharmacists did the intervention.	Level V, B, Good Quality
10	Soong, Kurabi, Wells, Caines, Morgan, Ramsden, & Bell (2014).	Cluster-Randomized Trial	<p>N = 328</p> <p> Toronto, Canada</p>	<p>Telephone call follow-up initiated after a 72-hour discharge from the hospital. The result of the study indicated that a post-discharge phone call had no significant effect on hospital utilization but had a minor impact on the quality of patient care transition from the hospital to home.</p>	<p>The implementation rate of the discharge phone calls was only 60%, reducing the effectiveness of the intervention. The study only evaluated readmission rates and</p>	Level 1, B, Good Quality

Article #	Author & Date	Evidence Type	Sample, Sample Size & Setting	Study findings that help answer the EBP question	Limitations	Evidence Level & Quality
					patient adherence to treatment plans and treatment visits.	
11	Tang, Fujimoto, Karliner (2014).	Quality Improvement Study	<p>N = 790</p> <p>486 – Full scripted</p> <p>229 – Message-scripted</p> <p>75 – missed encounter</p> <p>General Internal Medicine Practice at [REDACTED]</p>	<p>Scripted discharge phone call was done by the nurses for patients who were discharged from hospital to home. Phone call attempts were made within 72 hours of discharge. Topics that were discussed in the phone call were about arising symptoms, medication reconciliation, and issues with homecare needs of patients. The study results suggested that the discharge phone call program benefits patients in determining early signs and symptoms of the disease and issues with home and social services. Patients who received the phone call were more likely to go for a follow-up appointment. The study also indicated that there was no significant change in readmission rates.</p>	Single site study. Study was done in a diverse population and 15% of the sample size has limited skills in English language.	Level V, A, High Quality.
12	Shupe (2014)	Expert Opinion	N/A	Post-discharge phone calls helped improve patient experience and satisfaction and reduce readmissions. Study findings note that successful intervention can be achieved through consistency of calls, specificity of questions to target	Not mentioned in the article.	Level V, A, Quality

Article #	Author & Date	Evidence Type	Sample, Sample Size & Setting	Study findings that help answer the EBP question	Limitations	Evidence Level & Quality
				populations, and use of skills labs to evaluate and improve performance of interventionists.		

Appendix B: Conceptual Framework

Can a discharge phone call have an effect on reducing 30-day readmission rates for postoperative cardiac surgery patients?



Data Collection Instrument Tool

Patient #					
MRN#					
Age					
Gender					
Ethnicity					
Cardiac Surgery Service Patient					
Type of Procedure					
Date of discharge					
Discharge Location					
Contacted via Discharge Phone Call					
Hospital length of stay					
Readmitted after 30 Days of discharge					
Readmission Diagnosis					

Appendix D: Data Collection Decoder

Data Collection Decoder

Patient ID Number	1,2,3
Age Cohort	1- 18-40 2- >41-60 3- >61-80 4- >81-95
Gender	1- Male 2- Female
Race/Ethnicity	1- White/Caucasian 2- Black/African American 3- Hispanic 4- Asian 5- Other 6- Unknown
Cardiothoracic Surgery Service Patient	1- Yes 2- No
Type of Surgery Procedure	1- Coronary Artery Bypass Graft (CABG) 2- Heart Valve Surgery 3- Heart Valve Surgery & CABG 4- Aorta Surgery 5- Other type of cardiac surgery procedure
Date of Discharge	Month/Year of Surgery
Discharge Location	1- Home 2- Skilled Nursing Facility
Contacted via Discharge Phone Call	1- Yes 2- No
Hospital Length of Stay	1- Within 7 days 2- >10 days
Readmitted After 30 Days of Discharge	1- Yes 2- No
Readmission Diagnosis	1- Surgical Wound Infection 2- Pericardial Effusion 3- Abnormal Coagulation 4- Arrhythmia 5- Heart Failure 6- Other

Appendix E: Project Timeline

[illegible]

Appendix F: Budget**BUDGET**

<hr/>	
EXPENSE	Amount
Dissemination Poster	\$50.00
<hr/>	
Total	\$50.00

Appendix G: Descriptive Analysis*Frequency Counts for Selected Variables*

Variable	Category	<i>n</i>	%
Age ^a	18-40	6	7.5
	41-60	24	30.0
	61-80	46	57.5
	81-95	4	5.0
Gender	Male	52	65.0
	Female	28	35.0
Ethnicity	White/Caucasian	37	46.3
	Other	15	18.8
	Unknown	28	35.0
Procedure	Coronary Artery Bypass Graft (CABG)	23	28.8
	Heart Valve Surgery	29	36.3
	Heart Valve Surgery and CABG	6	7.5
	Aorta Surgery	6	7.5
	Other	16	20.1
Discharge Location	Home	76	95.0
	Skilled Nursing Facility	4	5.0
Phone Call	Yes	72	90.0
	No	8	10.0
Length of Stay	Within 7 days	43	53.8
	> 10 days	37	46.3
Readmission	Yes	5	6.3
	No	75	93.8

Note. $n = 80$.

^a Age: $Mdn = 70.50$ years.

Appendix H: Data Analysis*Association Between Discharge Phone Call and Readmission*

Readmitted	Had Phone Call		No Phone Call	
	<i>n</i>	%	<i>n</i>	%
Yes	5	6.9	0	0.0
No	67	93.1	8	100.0

Note. $N = 80$.

Note. $\chi^2 (1, N = 80) = 0.59, p = .44$. Fisher's Exact probability: ($p = 1.00$). Cramer's $V = .09$.

Appendix I: AHRQ Post-discharge Phone Script***Post-discharge Follow-up Phone Call Script (Patient Version)***

This form reinforces the information provided to the patient at discharge. The patient's discharge information should be available to the interviewer at the time of this call.

CALLER: Hello Mr./Ms. _____. I am [caller's name], a [type of clinician] from [name of hospital]. You may remember that when you left, the [hospital name] discharge educator, [DE name], mentioned you'd receive a call checking in on things. I am hoping to talk to you about your medical issues, see how you are doing, and see if there is anything I can do to help you. Do you mind if I ask you a few questions so I can see if there is anything I can help you with?

Is this a good time to talk? It will probably take about 15 to 20 minutes, depending on the number of medicines you are taking.

If yes, continue.

If no, CALLER: Is there a better time that I can call you back?

A. Health Status Diagnosis

CALLER: Before you left the hospital, [DE name] spoke to you about your main problem during your hospital stay. This is also called your "primary discharge diagnosis." Using your own words, can you explain to me what your main problem or diagnosis is?

If yes, confirm the patient's knowledge of the discharge diagnosis using the "teach-back" method. After the patient describes his or her diagnosis, clarify any misconceptions or misunderstandings using a question and answer format to keep the patient engaged.

If no, use this opportunity to provide patient education about the discharge diagnosis. Then conduct teach-back to confirm the patient understood.

CALLER: What did the medical team at the hospital tell you to watch out for to make sure you're o.k.?

Review specific symptoms to watch out for/things to do for this diagnosis (e.g., weigh self, check blood sugar, check blood pressure, create peak flow chart).

Measure patient's understanding of disease-related symptoms or symptoms of relapse (e.g., review diagnosis pages from AHCP).

CALLER: Do you have any questions for me about your main problem [diagnosis]? Is there anything I can better explain for you?

If yes, explain, using plain language (no jargon or medical terms).

If no, continue.

CALLER: Since you left the hospital, do *you* feel your main problem, [diagnosis], has improved, worsened, or not changed? What does your family or caregiver think?

If improved or no change, continue below.

If primary condition has worsened, •

CALLER: I'm sorry to hear that. How has it gotten worse? Have you spoken to or seen any doctors or nurses about this since you left the hospital?

- **If yes, CALLER:** Who have you spoken with/seen? And what did they suggest you do? Have you done that?
- Using clinical judgment, use this conversation to determine if further recommendations, teaching, or interventions are necessary.
- Record any action patient/caregiver has taken and your recommendations on the documentation sheet.

CALLER: Have any new medical problems come up since you left the hospital?

If yes:

CALLER: What has happened?

CALLER: Is there anyone else involved in your care that I should talk to?

- **If yes,** Name: _____
Phone number: _____

CALLER: Have you spoken to anyone about this problem? Prompt if necessary: Has anyone:

- Contacted or seen PCP?
- Gone to the ER/urgent care?
- Gone to another hospital/provider?
- Spoken with visiting nurse?
- Other?
- Following the conversation about the current state of the patient's medical condition, consider recommendations to make to the caregiver, such as calling PCP, going to emergency department, etc. Record any actions and recommendations on documentation sheet.

B. Medicines

High Alert Medicines

Use the guide below to help monitor medicines with significant risk for adverse events.

Drug Category	What To Look For
Anticoagulants	Bleeding; who is managing INR
Antibiotics	Diarrhea; backup method of birth control Should not taken at same time as calcium and multivitamin

Antiretrovirals	Review profile for drug interactions
Insulin	Inquire about fasting blood sugar
Antihypertensives	Dizziness If yes, suggest patient space out medicines (keep diuretic in a.m.)
Medicines related to primary diagnosis	Focus on acquisition and medication adherence

Can you bring all of your medicines to the phone, please? We will review them during this call. Bring both prescription medicines and over-the-counter medicines, the ones you can buy at a drugstore without a prescription. Also, bring any supplements or traditional medicines, such as herbs, you are taking. Finally, could you also please bring to the phone the care plan that we gave you before you left the hospital?

CALLER: Do you have all of your medicines in front of you now?

CALLER: I'm going to ask you a few questions about each one of your medicines to see if there is anything I can help you with. We will go through your medicines one by one.

First of all, I want to make sure that the medicines you were given were the right ones. Then we'll discuss how often you've been able to take them and any problems or questions you might have about any of them.

Choose one of your medicines to start with.

What is the name of this medicine? The name of it should be on the label. **If the patient is using a generic**, check that he or she understands that the brand and generic names are two names for the same medicine.

- At what times during the day do you take this medicine?
- How much do you take each time?

If the patient answers in terms of how many pills, lozenges, suppositories, etc. What is the strength of the medicine? It should say a number and a unit such as mg or mcg.

- How do you take this medicine? **If there are special instructions** (e.g., take with food), probe as to whether the patient knows the instructions and whether he or she is taking the medicine as instructed.
- What do you take this medicine for?
- Have you had any concerns or problems taking this medicine? Has anything gotten in the way of your being able to take it? Have you ever missed taking this medicine when you were supposed to? Why?
- Do you think you are experiencing any side effects from the medicine?

If yes, Could you please describe these side effects?

- Are you taking any other medicines? Repeat list of questions for each medicine.
- After patient has described all medicines, ask: Are you taking any additional medicines that you haven't already told me about, including other prescription medicines,

over-the-counter medicines, that is, medicines you can get without a prescription, or herbal medicines, vitamins, or supplements?

If patient has been prescribed medicines that the patient hasn't mentioned, ask whether he or she is taking that medicine.

- **If yes**, go through the list of medicine questions.
- **If not**, probe as to why not. **If patient is unaware of the medicine**, make a note to check with discharge physician as to whether patient is supposed to be taking it, whether a prescription was issued, etc.

CALLER: Have you been using the medicine calendar (in your care plan) that was given to you when you left the hospital?

If yes, provide positive reinforcement of this tool.

If no, suggest using this tool to help remember to take the medicines as directed. **If patient has lost care plan**, offer to send a new copy of AHCP by mail or email.

CALLER: Do you use a pill box?

If yes, provide positive reinforcement of using this tool.

If no, suggest using this tool to help remember to take the medicines as ordered.

CALLER: What questions do you have today regarding your medicines and medicine calendar (if using)?

CALLER: Does your family or caregiver have any questions or concerns about your medicines?

****Please note on the documentation sheet any recommendation you made to the patient and followup actions you took.****

C. Clarification of Appointments

CALLER: Now, I'm going to make sure you and I have the same information about your appointments and tests that are coming up. You were given appointments with your doctors [and for lab tests] when you left the hospital. Can you please tell me:

What is the next appointment you have scheduled?

Who is your appointment with?

What is your appointment for?

When is this appointment?

What is your plan for getting to your appointment?

Are you going to be able to make it to your appointment? Is there anything that might get in the way of your getting to this appointment?

- **If yes**, Let's talk about how we can work around these difficulties.
- **If patient plans to keep appointment, ask**, Do you have the phone number to call if something unexpectedly comes up and you can't make the appointment?

- **If patient can't keep appointment**, get the patient to reschedule: As soon as we hang up, can you call to reschedule your appointment? **If patient is unable or unwilling to make the call to reschedule**, offer to make the call: I can reschedule that appointment for you. What days and times would you be able to make an appointment? **After you get several times, say**, Thanks. I'll call you back when I've been able to set up the appointment. **If patient refuses to cooperate**, consult the DE and hospital team.
- Do you have any other appointments scheduled? **If yes**, repeat the set of questions. **If no**, but other appointments are scheduled, ask, Are you looking at the care plan? Are there any other appointments listed there? Review these appointments.

D. Coordination of Post-discharge Home Services (if applicable):

CALLER: Have you been visited by [name of service, e.g., visiting nurse, respiratory therapist] since you came home?

If no, CALLER: I will call to make sure they are coming soon.

CALLER: Have you received the [name of equipment] that was supposed to be delivered?

If no, CALLER: I will call to make sure it is coming soon.

CALLER: I understand that [name of caregiver] was going to help you out at home. Has [name of caregiver] been able to provide the help you need?

If no, CALLER: Are you going to call [name of caregiver] to see if she [or he] is going to be able to help you?

- **If no**, Is there anyone else that could help you out? Can you call [her/him] to see when [she/he] could come?

E. What To Do If a Problem Arises

CALLER: Before we hang up, I want to make sure that if a medical problem arises, you know what to do. If you're having an emergency, for example [give disease-specific examples, e.g., chest pain, trouble breathing], what would you do?

If patient does not say, "Call 911," explain the need to get an ambulance so he or she can see a doctor right away, and confirm patient understanding.

CALLER: And what about if you [give example of urgent but not emergent problem] in the evening? What would you do then? Check if patient knows how to reach the doctor after hours. **If DE help line operates after hours**, check that the patient knows that and can find the number on the AHCP. Confirm understanding.

CALLER: And what about if you are having a medical problem that is not an emergency, such as [give disease-specific examples] and want to be seen by your doctor before your next scheduled appointment, what would you do?

If patient does not know, instruct: You can call your doctor's office directly and ask for an earlier appointment. Sometimes your doctor is very busy, so if you are having difficulty obtaining an appointment, ask if you can be seen by someone else in the office, such as a nurse, nurse practitioner, or physician's assistant. Confirm understanding.

CALLER: Just to make sure we're on the same page, can you tell me what you'd do if [create nonemergent scenario]?

If patient answers incorrectly, ask: Do you have your doctor's phone number handy? It should be on the care plan on the appointments page. **If patient can't tell you the number, say,** Let me give you the phone number for your primary care doctor just in case. Do you have a pen and paper to write this down? Do you need me to mail or email you another copy of your care plan?

- **If yes,** confirm address or email.

CALLER: Do your caregivers have these numbers also?

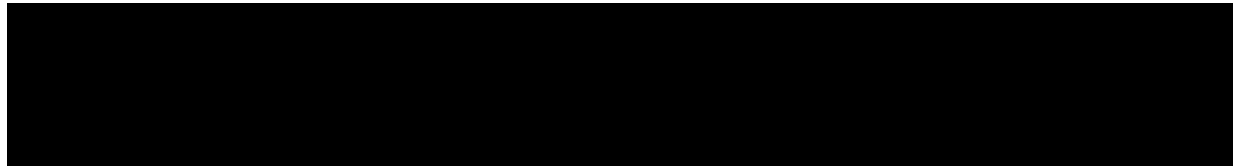
If no, ask: Would you like me to email or mail a copy of your care plan to them?

If yes, confirm address or email.

CALLER: That's all I needed to talk to you about. We've covered a lot of information. What questions can I answer for you?

If none, CALLER: Thank you and have a good day. If you have to follow up with patient on anything, remind him or her that you will be calling back.

If the patient has questions, answer them.

Appendix J: Letter of Permission

March 12, 2019

Ms. Ana Clarita Haguisan
Doctoral student
School of Nursing
Rutgers University

Dear Ms. Haguisan

:

Thank you for your inquiry about the RED toolkit. I am responding on behalf of [REDACTED]

[REDACTED] and at the request of [REDACTED] I handle the majority of permission requests for the Agency.

With the information that you provided in your initial request and, in your subsequent emails, I am able to grant your request. This letter constitutes formal permission from the AHRQ to you for use of materials in "Tool 5: How to Conduct a Postdischarge Followup Phone Call" from the AHRQ *Re-Engineering Discharge Toolkit* in your Doctor of Nursing Practice Capstone project at Rutgers University School of Nursing. Specifically, you have permission to copy, adapt (if desired), and use the "Phone Call Role-Play," "Postdischarge Followup Phone Call Script (Patient Version)," and the "Postdischarge Followup Phone Call Documentation Form." You should note on the forms "[Reprinted/Adapted] with permission of the Agency for Healthcare Research and Quality." The suggested reference citation for the RED toolkit is:

Re-Engineered Discharge (RED) Toolkit. [Tools and Forms]. Agency for Healthcare Research and Quality, Rockville, MD, March 2013. <http://www.ahrq.gov/professionals/systems/hospital/red/toolkit/index.html>

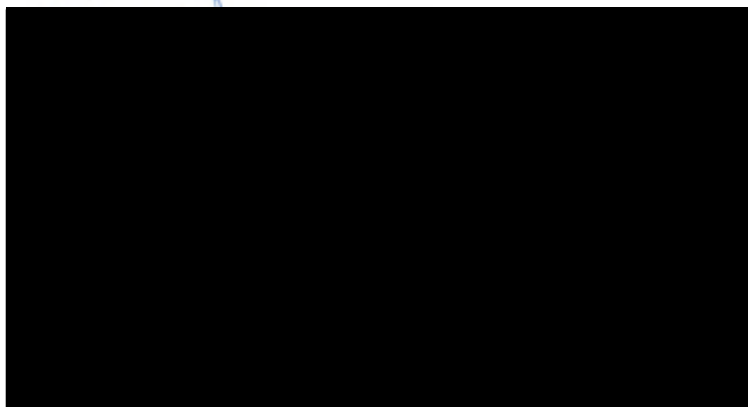
You also have permission to print copies of the RED Toolkit User's Guide for yourself, any collaborators, and your DNP advisor and committee. The suggested reference citation for this document is:

Jack BW, Pausche-Orlow MK, Mitchell SM, et al. An overview of the Re-Engineered Discharge (RED) Toolkit. (Prepared by Boston University under Contract No. HHS A2902006000121.) Rockville, MD: Agency for Healthcare Research and Quality; March 2013. AHRQ Publication No. 12(13) 0084. <https://www.ahrq.gov/sites/default/files/publications/files/redtoolkit.pdf>

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All the best with your project and degree program.

Sincerely,



Appendix H: Call Questions

1. **How are you feeling since you were discharge?**
2. **How does your wound look like?**
3. **Any specific symptoms that were addressed in the discharge teaching that you are experiencing such as chest pain, shortness of breathing, increase in weight, and discharges on the wound site?**
4. **Did you get all your prescribed medications from the pharmacy? Do you have any problem or any questions regarding your medications?**
5. **Did you schedule your appointment with your cardiologist? After 4 to 6 weeks of being discharge you have to make sure to make an appointment with your cardiac surgeon.**
6. **Have you been visited by the visiting nurse services since you were home?**
7. **If you experience any of the addressed symptoms, make sure to contact your primary care provider or cardiologist and also call the surgeons office. If you happen to experience any chest pain and difficulty breathing during weekends or in the middle of the night, don't hesitate to dial 911 or go to the nearest emergency room.**
8. **If you have any questions, we are here 24/7 and you can call our unit number 122-222-2222. One of the nurses or physician assistants can help you.**
9. **Do you have any questions for me?**
10. **Thank you and I hope you have a speedy recovery.**