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# The Impact of Social Factors on Readmission Rates of Heart Failure Patients

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The Impact of Social Factors on Readmission Rates of Heart Failure Patients

by

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Abstract

Heart Failure is the most common reason for readmission among Medicare fee-for-service patients. While there are medical and health related factors such as medication adherence and comorbidities that contribute to heart failure readmissions, there are many social factors that cause readmission as well. This thesis will focus on the impact social factors have on heart failure patients that lead to their readmission. It will also discuss evidence-based interventions that reduce readmissions and improve the performance of hospitals on their 30-day readmission performance measure. Reducing readmissions in patients with heart failure will reduce hospital costs. It will also help to close the gap that social factors have created in heart failure patients.

*Keywords:* congestive heart failure, readmission, social factors

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**CHAPTER I**

**Introduction**

Reducing readmissions into the hospital setting has been a top priority in healthcare organizations. This was largely due to the fact that reimbursement is tied to the quality of care patients receive during their initial inpatient stay. In the past, this was not an issue as the healthcare infrastructure was built for volume and not for value. Reimbursement is now based on new systems such as hospital value-based purchasing (HVBP), bundled payments, and other initiatives. Medicare implemented the HVBP to provide bonuses to hospitals that meet performance standards within a performance period for the fiscal year. This required strong communication skills and collaboration among the healthcare providers. Drachenberg, Spector, and Thomas (2016) found in many of these cases, the readmissions could have been avoided if the hospital clinicians had better communications with each other, with their peers as post-acute providers, with healthcare payers, and with the patients and families themselves.

Heart failure (HF) is one of the leading causes of hospital readmissions in the United States. Vader et al. (2016) found that it was the primary admission diagnosis for greater than one million hospitalizations and the secondary diagnosis in greater than three million hospitalizations in the United States each year resulting in aggregate costs of greater than 10 billion dollars. In an effort to decrease the number of readmissions and costs, identifying all factors that could potentially cause readmissions were an important part of the care coordination both during their hospitalization and post discharge. This insight has also allowed healthcare providers to improve the management of HF.

**Significance**

Heart failure accounts for approximately 25% of readmissions within 30 days of discharge (Vader et al., 2016).  It has become an increasing healthcare burden and the focus for clinicians, researchers, and other various stakeholders.  This was attributed to the perception that the readmissions were seen as a correctable source of poor quality of care and excessive medical spending.  Ziaeian and Fonarow, (2015) found that approximately 5.7 million American adults are living with HF and the projections are that the prevalence of HF will increase 46% from 2012 to 2030 with greater than eight million adults living with the chronic condition.

Social factors that contributed to heart failure readmissions were demographic, physiologic, psychosocial, and behavioral in nature. Examples included transportation issues to and from appointments, low income or socioeconomic status, insurance, and lack of social support.  Annema, Lettik, and Jaarsma (2009) found that there were multiple factors related to hospital readmissions.  These factors included mental or emotional factors such as pain, anxiety, insecurity, depression, substance abuse, and cognitive disorders.  "Mild cognitive dysfunction is often a hidden co-morbidity and may help to explain the difficulties patients with heart failure have in mastering self-care management" (Camero et al., 2010, p. 514).

Additional underlying social factors for readmission were nonadherence to diet, fluid restrictions, or medications, non-optimal medication regimen, and insufficient professional help.  Annema et al. (2009) arrived at the most important intervention to prevent readmission was adherence to a patient's fluid restriction.  When patients with HF were compliant with their fluid restrictions, this reduced hospital admissions by 33%

(Annema et al., 2009). Effective management of these social factors would require adequate professional help, sufficient adequate discharge planning, additional follow-up, and optimization of the medication regimen.

**Purpose**

Heart failure continued to be one of the leading health conditions with a high hospital readmission rate nationwide. While there were a multitude of medical reasons causing these patients to be readmitted, social factors played a significant role as well. "In other scenarios, patients may come back to the hospital because they didn't understand the discharge instructions or the importance of following them, their living situation or financial issues made it difficult to follow their treatment plans, they were unhappy with their post-acute facility, or because they couldn't afford their medication or needed post-acute services that were not covered by insurance" (Drachenberg et al., 2016, p. 1).

The purpose of this MSN thesis was to identify what social factors have an impact on the readmission of heart failure patients at Duke University Hospital (DUH) in North Carolina. The purpose was achieved through a retrospective chart review of up to 72 patients with a primary diagnosis of HF and were readmitted within 30 days of discharge. Data extracted from the chart review was from patients that were admitted to DUH between March 1, 2017 thru May 1, 2017 and subsequently readmitted before May 31, 2017.

**Theoretical or Conceptual Framework**

Joanne Duffy's Quality-Caring Model was used to guide this MSN Thesis (see Appendix A). She developed a model to guide practice and research as nurse caring behaviors interfaced with patient outcomes. With outcome measurements being Duffy's

area of expertise, she focused on maximizing the patient's outcomes through the caring processes. In this model, the nurses were specifically responsible for integrating caring relationships with specific evidenced-based nursing interventions to achieve optimal health outcomes. Optimal outcomes for heart failure patients consisted of reducing readmissions and managing their heart failure post discharge. The role of the nurse in this caring relationship was to engage in continuous learning and practice-based research and then transfer this knowledge to the patient so they can be successful managers of their heart failure post discharge.

It was imperative that patients with heart failure feel safe and confident about their condition and how to manage it. "Studies suggest effective self-management can reduce costly hospital readmissions and complications associated with chronic diseases and help patients achieve healthier outcomes and a better quality of life overall" (Mead, Andres, Ramos, Siegel, & Regenstein, 2010, p.69). Duffy had identified eight caring factors that are used to characterize caring in the quality-caring model (Smith & Parker, 2015). Mutual problem solving was one factor that was and should be required and modeled when caring for heart failure patients. "Mutual problem solving refers to assisting patients and families to learn about, question, and participate in their health or illness" (Smith & Parker, 2015, p. 399). This empowered patient to take ownership and responsibility for their healthcare and allowed them to make informed decisions which allowed for optimal outcomes and possibly decreased readmissions.

**Thesis Question or Hypothesis**

The thesis question was what social factors are associated with the readmissions of patients with heart failure. The study variables were adult patients, age 18 years old or

greater) with a primary diagnosis of heart failure and had social factors that contributed to their readmission to the hospital within 30 days of discharge from Duke University Hospital.

## Brief Summary

There was very limited literature and research on social factors that put heart failure patients at risk for readmission.  There were also many social factors that contributed to a patient's readmission beyond their stay in the hospital.  These factors were demographic, physiologic, psychosocial, or behavioral. The purpose of this MSN thesis was to identify the social factors that impacted a HF patient's readmission.  As a result, effective interventions and resources were put in place to help close the gaps and decrease the readmissions of heart failure patients.

## Definition of Terms

- Anonymity – protection of participant's confidentiality such that even the researcher cannot link individuals with the data they provided.

- Centers for Medicare and Medicaid Services- (CMS)-a part of the Department of Health and Human Services responsible for managing the entitlement systems of Medicare and Medicaid in the United States.

- Comorbidities – medical conditions present simultaneously in a patient.

- Confidentiality – protection of study participants so that data provided are never publicly divulged.

- Heart Failure- a condition where the heart cannot pump enough blood and oxygen to support other organs in the body.

- Covert data collection – the collection of information in a study without participant's knowledge.

- Non-experimental Research – studies in which the researcher collects data without introducing an intervention; also, called observational research.

- Nonadherence – in medical jargon, a patient is non-adherent when they do not follow the prescribed plan of care.

- Quality Caring Model – theory developed in 2003 by Joanne Duffy to examine the link between nurse caring behaviors and patient outcomes.

- Readmission- an admission to an acute care hospital within 30 days of discharge from an acute care hospital.

- Risk Factor – a condition, behavior, or other factor that increases risk.

**CHAPTER II**

**Literature Review**

Heart failure (HF) is one of several chronic diseases that have high 30-day readmission rates. This disease disproportionately affected elderly patients over the age of 65 who have comorbidities and are covered under Medicare or Medicaid insurance. Ziaeian and Fonarow (2015) found that per Medicare, from 2009-2012 the median risk-standardized 30-day readmission rate for HF was 23.0%. Chronic illnesses such as HF, pneumonia, and diabetes were increasingly being managed at home or on an outpatient basis. It is important that all factors that impact a patient's illness be addressed and managed during the patient's inpatient stay and reviewed at hospital discharge. They should also be discussed at any follow up appointments thereafter. While discharge planning was usually the responsibility of the case manager, it was vital that all members of the healthcare team establish these relationships. Insurance payers were not reimbursing hospitals for patient's readmissions within 30 days of the last admission. They were following the guidelines of CMS and developing their own value based payment initiative. The literature review concentrated on three areas: risk factors for hospital readmissions, social factors in hospital readmissions, and social factors specifically in heart failure readmissions.

**Search Strategy**

The University's database powered by EBScohost was used to search for articles to support the thesis. The search was then limited to full text, peer reviewed articles, and academic journals during the time frame of 2009-2017. Two-hundred forty articles were resulted initially, however some were listed twice, charged a fee to see the full article, or

the article referenced readmissions with another disease process such as diabetes or pneumonia. Keywords such as congestive heart failure, Medicare, readmission rates, heart failure and readmissions, and risk factors related to heart failure were utilized. Joanne Duffy's Quality Care Model was also explored.

Additional items that resulted with HF were marital status, heart transplants, drug therapy, and a patient's spiritual well-being. The last search entered were specific social factors related to heart failure readmissions.  Eighty articles were resulted. Additional links were on the American Heart Association site and the Centers for Disease Control (CDC) websites.  These websites contained links to other databases and articles such as Medline Plus, the National Heart, Lung, and Blood Institute, American Heart Association, and the Heart Failure Society of America.

**Risk Factors for Readmission**

There were several risk factors that place patients on the radar for readmission back into the hospital setting. More specifically, these barriers included an extension of communication amongst the healthcare team caring for the patient, the patient's lack of education and understanding of their condition, how to manage it as an outpatient, and hospital operations.  Jencks, Williams, and Coleman (2009) found that unplanned hospital readmissions were typically caused by hospital acquired infections, premature discharge, lack of adequate discharge planning and coordination, poor communication and patient education, and prescription drug complications.

Ziaeian and Fonarow (2015) found that readmissions received particular attention from researchers and policy makers as they were perceived as a correctable source of quality care and excessive medical spending.  "An important measure of hospital quality

is the incidence of unplanned or unexpected readmissions" (Haley, Zhao, & Spaulding, 2016, p.110).  Communication was key and the lack of it prevents patients from receiving coordinated care and the patient suffering adverse effects.  Kushel (2016) found that other risks identified for readmission focus on several initiatives.  They included the need to improve communication between hospital staff and outpatient providers, reduce medication errors, and recognize worrisome symptoms early.  These initiatives became complicated when the patient was unavailable or when members of the patient's healthcare team post-discharge were not able to be reached.

A significant role on the healthcare team of patients is the case manager. They specialize in managing needs during their inpatient stay as well as the patient's transition from inpatient to outpatient at the time of discharge.   "Having an improved understanding of the role of social factors in post-discharge outcomes can assist hospitals' decision making around prioritizing and evaluating interventions to improve transitional care.  (Nagasaki, Reidhead, Waterman, & Dunagan, 2014, p. 790).  This collaboration benefits the patient extensively and could potentially prevent the patient from being readmitted.  "It's important to have that connection between the inpatient case manager and the community case manager who may be going into the patient home or working with the patient at the physician's office" (Drachenberg et al., 2016, p. 3).

Hospital operations must also make changes in their infrastructure, relationships with others, and care delivery. "Because the transition to value-based models inherently includes quality and cost, it is a critical arena for collaboration between clinical and financial leaders" (Angood & Fifer, 2015, p. 13).   Developing relationships with local

skilled nursing facilities and home health agencies can benefit the patient tremendously with regards to continuity of care.

Making operational changes help to ensure patients overcome the clinical barriers to a safe discharge. Changing the focus on how a patient's entire continuum to better health must be addressed to elicit optimal outcomes post discharge and reduced readmissions. "Nevertheless, the goal for health systems should be to reduce all avoidable admissions whether index hospitalization or repeat admission" (Ziaeian & Fonarow, 2015, p. 379).

"One reason patients are being readmitted is that they get home and don't know how to take care of themselves, or the family doesn't realize the extent of the care they have to provide" (Drachenberg et al., 2016, p.3). Educating the patient, the family members, and confirming that they understand and are competent to care for themselves post-discharge was crucial and can be the difference between a patient being readmitted or managing their conditions as an outpatient. Centrella-Nigro et al. (2016) believed that having supportive, educated family caregivers is a significant factor in preventing readmission for HF.

**Social factors in readmissions.** Nagasaki et al. (2014) found that social factors can be important determinants of health outcomes. Social factors in general that contributed to readmission include substance abuse that may be accompanied with emotional or mental factor, insufficient finances for food or other resources, and inadequate discharge planning. Noori, Shokoohi, Baneshi, Naderi, Bakhshandeh, & Haghdoost (2016) (as cited in Smith, Stocks, & Santora, 2015) found previous studies had documented that the Socio-economic Status (SES) of CHF patients was a crucial

indicator which might influence the patient's behavioral pattern, environmental exposures, and access to healthcare services. "Hospital admission and readmissions of individuals with mental health and substance abuse (MHSA) conditions are prevalent and costly occurrences" (Smith, Stocks, & Santora, 2015, p. 190). This population includes patients that are depressed, have anxiety and personality disorders, Alzheimer or other dementias, other psychotic disorders, or other impulse control disorders.

Treatment for patients with (MHSA) has shifted over the last 30 years from the free-standing private or government inpatient setting to community hospitals that are only available for short terms. These facilities have a limited amount of beds dedicated for psychiatric use. There are also beds available at Veterans Affair Hospitals. Unfortunately, the Emergency Department (ED) is the common entry point for patients with MHSA to be admitted or committed and they have the highest rate of ED visits. Smith et al. (2015) found that the readmissions and ED revisits were significantly more likely to occur when there were certain conditions on the index visit, namely, alcohol or drug dependence, dementia, psychotic disorders, autism, impulse control disorders, and personality disorders.

There also was a relationship between homelessness and readmissions that has been recognized. Kushel (2016) found that while some of this may be due to shared risk factors – substance use and mental health problems were associated with both homelessness and acute care utilization – much of it was due to the conditions of homelessness itself. This was especially true in thinking about hospital readmissions (Kushel, 2016). Sometimes these patients were discharged to post-acute care (PAC) facilities. These facilities played a critical role in the care of patients once they are

discharged from the inpatient setting.   Horney, Capp, Boxer, and Burke (2017) found that those admitted to a PAC facility had an increased risk of hospital admission; with over 23% of PAC episodes ending in re-hospitalization within 30 days of hospital discharge.

There are millions of households that lack the funds and resources needed to obtain both food and medication.  This was known as food insecurity which leads to increased hospital admissions.  Swinburne, Garfield, and Wasserman (2017) found that many food insecure individuals must decide whether to spend their limited resources on medication or food.  Unfortunately, food insecurity was also associated with other health conditions including anxiety and depression, hypertension, diabetes, and obesity.

**Social factors in heart failure readmissions.** Horwitz and Krumholz (2015), found that over one million people were admitted annually to an inpatient setting for HF, and about one-quarter of these patients were readmitted within 30 days of discharge. Several of the social factors for readmissions were reiterated in the specific social factors that impact HF patients.  They were substance abuse, depression, and living situation. Additional distinct social factors that impact heart failure readmissions were cognitive disorders, diet, and fluid restriction.

Cognitive deficits in HF patients are sometimes hard to detect.  It is usually caused by inadequate cerebral perfusion and hypoxic brain damage.  Cameron et al., (2010) found that cognitive impairment is of concern as it is associated with relatively poorer health outcomes in those with CHF.   These patients may display inability to make appropriate self-care decisions, impaired memory and concentration, and a decreased attention span.

"The American Heart Association recommends a sodium intake of no more than 2-3g/day to control heart failure, but advertise that the recommendations should be individualized according to disease severity" (Alves, Souza, Brunetto, Perry, & Biolo, 2012, p. 442).  When it comes to diet and fluid restriction in HF patients, non-pharmacologic measures were often preferred.  These measures helped the patient to maintain stability, decrease mortality, avoid hospital readmissions by having a low sodium balanced diet and controlling their weight and water intake.  Swinburne et al., (2017) stated that poor adherence to a low sodium diet was associated with increased readmission and mortality among heart failure patients.

Each of these social factors echoed the importance of health care teams to implement effective interventions to reduce the readmission of patients with HF while providing high-quality care.  Centrella-Nigro et al. (2016) stated to implement best practices, hospital administrators need to understand the demographic, physiologic, and psychosocial characteristics of patients with HF and the reasons for their readmissions.

## Summary and Research Gaps

Unfortunately, there were some gaps noted when discussing the impact of social factors on heart failure patients that are readmitted to the hospital. This was especially true when patients have other medical conditions in addition to heart failure that may cause the patient to be readmitted such as diabetes or pneumonia.  Smith et al. (2015) also felt that identifying knowledge gaps of what determines repeat hospitalizations for those with MHSA conditions will be an essential priority in preventing readmissions and reducing costs. Nagasaki et al. (2014) believed that although social factors may interact with readmission risk and prevention in complex ways, the effect of including social

factors in models quantifying readmission rates was not well understood.  There was also a lack of socio-demographic data, patient perspective data, and too much administrative data used.

Nagasaki et al. (2014) believed that as health care providers change the way care is delivered, it was important that care for patients from vulnerable populations not be compromised.  Identifying the risk factors and creating a successful transition plan from inpatient to the outpatient setting is key.  Communication, collaboration, and the education of patients must start during inpatient and should be 1:1 with the patient, their families, and the nurse.  "Many readmissions occur because some vital piece of information falls through the cracks when patients transition between levels of care" (Drachenberg et al., 2016, p.1).

The goal of this MSN thesis was to identify social factors that impact readmissions of HF patients. How well a HF patient moved along the continuum from illness to wellness in HF was influenced by multiple social factors.  The literature supported communication amongst the care team, education of the patient, and changes in hospital operations as key elements.  Factors identified included substance abuse, emotional, and mental, insufficient resources, and inadequate discharge planning. Additional factors specific to HF patients included their living situation, diet, and cognitive function.  While there was cited data to support many of these factors, there are knowledge gaps that can be further investigated.

**CHAPTER III**

**Methodology**

The purpose of this thesis was to identify social factors that are associated with readmissions in heart failure patients. Once the social factors were identified, health care providers were able to collaborate about the resources and interventions that were implemented to prevent future readmissions. Ziaeian and Fonarow (2015) found that preventing readmissions for HF patients was an increasing priority for clinicians, researchers, and various stakeholders. This chapter discussed the study design, the sample size and setting, and how the data was obtained and recorded. The patient's rights and health information was not compromised and their identity was kept confidential.

**Study Design**

The research for this thesis was conducted as a retrospective chart review. A manual data abstraction of the data results – social factors – was obtained by the researcher and recorded on a Microsoft Word Table. Patients for this study design were identified by their primary diagnosis of heart failure and had been readmitted within the last 30 days after discharge from the same facility. This study design was conducted to identify and understand the impact that social factors had on heart failure patients and how they contributed to the readmission of heart failure patients.

**Setting and Sample**

This retrospective study reviewed 72 charts of adults with a diagnosis of HF who were readmitted to Duke University Hospital (DUH) within 30 days of discharge. Adult was defined as 18 years or older. Duke University Hospital was one of three hospitals that make up Duke University Health System (DUHS). It was an urban hospital in North

Carolina that was consistently rated as one of the best in the nation and was ranked in the

top 20 nationally for seven adult specialties which include cardiology and heart surgery.

Subjects were obtained via the Deduce Platform of DUH. Deduce is a web based

data query tool used for clinical research, administrative, and quality improvement

projects. The acronym Deduce stands for Duke Enterprise Data Unified Content

Explorer (see Appendix B). The Deduce list was stored within the secured Deduce

platform without any protected health information (PHI). All Duke network access

occurred via encrypted connections. They include Secure Shell (SSH), Remote

Desktop Protocol (RDP), and Virtual Private Network (VPN) and were required to

enact protections on their computers that access Duke's Protected Network (see

Appendix C).

## Design for Data Collection

The retrospective chart review provided the information for data collection.

Using Deduce platform, a list of adult patients with the diagnosis of HF was generated to

assess the readmission factors. The list obtained by Deduce contained MRNs that was

used to perform the chart review. The medical record numbers (MRNs) of subjects were

used to guide the manual data abstraction.

De-identified data abstracted from the electronic medical record (EMR) was

manually recorded on a Microsoft Word Table in the CHF folder housed on the Duke

University School of Nursing (DUSON) Shared Drive (\\duhsnas-pri\son\share\SED\CHF

folder). All backups of data are stored in the protected network and were encrypted and

required to enact protections in their computers that access Duke's Protected Network.

The protections included regular patching, running an antivirus program, encrypting laptops, and enabling a host-based firewall.

## Measurement Methods

De-identified data abstracted from the electronic medical record (EMR) was manually recorded on a Microsoft Word Table (see Appendix D).  The data abstracted included the index or initial length of stay, the readmission length of stay, the patient's age, index medications, and readmission medications. All social factors related to the patient's readmission was documented on the spreadsheet.

## Data Collection Procedure

The research procedure involved the collection and study of existing data.  The researcher obtained the list of subjects with HF who were readmitted to DUH within 30 days of being discharged using the Deduce Platform.  Using the MRN to access the EMR, the initial admission and readmission encounters were examined for the required data by reading all progress notes relevant for that admission.  The documented social factors were the only research data used to support my hypothesis.  This data was recorded on a Microsoft Word Table and did not contain any protected health information.  There was not any patient interaction between the researcher and the patient, therefore a consent was not required.

## Protection of Human Subjects

This was a retrospective study where the research data results – social factors – were obtained via a chart review.   Using Deduce platform, we generated a list of adult patients with the diagnosis of HF to assess the readmission factors.  The list obtained by Deduce contained MRNs that was used to perform the chart review. The Deduce list was

stored within the secured Deduce platform of DUH. There were not any MRN's or PHI recorded on the Microsoft Word Table, nor were they used for exploration into social factors and readmission risk. Once the chart review was completed, the Deduce list and SSA list with MRNs were destroyed.

All Duke network access occurred via encrypted connections. They included Secure Shell (SSH), Remote Desktop Protocol (RDP), and Virtual Private Network (VPN) and were required to enact protections on their computers that access Duke's Protected Network. The protections included regular patching, running an antivirus program, encrypting, laptops, and enabling a host base firewall.

## Data Analysis

The retrospective chart review provided the information for data collection. The medical record numbers (MRNs) of subjects was used to guide the manual data abstraction. De-identified data abstracted from the electronic medical record (EMR) was manually recorded on the Microsoft Word Table.

Descriptive Statistics was used to obtain the percentage of each social factor that contributed to this HF population. The results were displayed on a pie chart. There were several assumptions that were made in this analysis. First, there were real and absolute social factors that contributed directly to HF patient's being readmitted into the hospital within thirty days of their previous discharge. Any factors not documented in the chart were limitations in the study. Secondly, the results were not influenced by the researcher. In addition, the values and prejudices of the subjects were accountable for contributing to the readmission and the researcher remained objective and non-biased.

**CHAPTER IV**

**Results**

There were many factors that contribute to HF patients being readmitted into the hospital. Despite patients receiving high quality care with their initial admission and case managers providing needed resources upon discharge, patients still found themselves being readmitted. This chapter discussed the characteristics of the sample size and major findings in the data.

**Sample Characteristics**

The sample size consisted of 72 patients with a diagnosis of heart failure. These patients were readmitted with a diagnosis of heart failure between March 1, 2017 and May 30, 2017. Other characteristics are as follows: 55% were African American, 42% were Caucasian, less than 1% were Asian or American Indian. In addition, 49% were males, 51% were females, 45% were married, and 23% were single.

Living arrangements for patients with HF affected their chance of being readmitted especially if they were homeless or their caregivers lacked the knowledge on how to care for their disease. Only 2.78% of the sample size were homeless. Heart failure patients that lived with their caregivers account for 59.72% and 31.94% lived alone. Other living arrangements such as skilled nursing facilities (SNF) or long term acute care (LTAC) facilities only accounted for 5.56% of the sample size.

**Major Findings**

Patients that have heart failure were often readmitted within a 30-day period after discharge. This thesis focused on the documented social factors from the data collection associated with their readmission. They included but were not limited to living

arrangements, lack of diet and nutrition education, lack of resources to obtain food or

medication, cognitive, mental or emotional factors, substance alcohol or drug dependence

or ineffective transitional care from inpatient to outpatient. The factors associated with

the readmissions were illustrated on pie charts (see Appendix E).

Educating patients as well as those caring for them was vital in preventing

readmissions and key to successfully managing HF. Review of the charts confirmed that

100% of the patients and/or caregivers received education related to HF. Documented

education of these patients included diet and nutrition, medication education, fluid

restrictions, pain management, heart failure disease management, activity limitations and

importance of safe activity, and energy conservation.

It is known that majority of those with HF were elderly patients and were on fixed

incomes. Surprisingly, this sample size only had 2.78% of patients that needed additional

resources to obtain food or medications. These patients used Meals on Wheels for food.

There were not any patients that lacked resources to obtain medications. This was largely

due to Case Managers providing the needed resources prior to discharge.

There were five different cognitive, mental, or emotional factors that were related

to HF readmissions. They included depression, stress and anxiety related to the end

stages of HF and the symptomology and being stressed over the costs of housing once

their days of rehabilitation were exhausted. Finally, there were HF patients with

dementia and those receiving Electroconvulsive Therapy that were readmitted. These

factors accounted for 11.1%. Only 1.39% of patients abused alcohol and drugs, and

smoked.

Upon discharge, HF patients were transitioned to home with home health, skilled nursing facilities (SNF), rehabilitation centers, long term acute care (LTAC) facilities, or they expired. Sixty-eight percent went home with home health, 8.33% went to SNF's, 2.78% went to other rehab centers or LTAC's, and 20.83% expired prior to discharge.

## Summary

The data collected confirmed that social factors do contribute to the readmissions of HF patients. In fact, 100% of the patients were educated prior to discharge and still required readmission. Over half of the patients lived with their caregivers while those who lived alone were significant as well. Of the sample size, there was a very small percentage of patients that needed additional resources for food or medication or abused drugs and alcohol. Heart failure patients that had cognitive, mental, or emotional factors accounted for 11%, while less than 3% of the patients had an ineffective transition to the outpatient setting. These patients were homeless. While the sample size was small and the data yielded small percentages of the risk factors, the fact still remains that 72 HF patients were still readmitted.

**CHAPTER V**

**Discussion**

A fundamental element in the prevention of heart failure patients being readmitted into the hospital setting was identifying the social factors that played a role in it. While there is much collaboration, data, and research surrounding these readmissions, heart failure patients continued to find themselves back in the hospital. Clearly, we have not found the solution. This chapter discussed the social factors that may have had an impact on the readmission of heart failure patients at DUH in North Carolina.

**Implication of Findings**

A major finding in this study was that 100% of patients and or their caregivers received education about heart failure prior to being discharged from their initial admission. Previous research by Centrella-Nigro et al. (2016) believed that educating family caregivers was a significant factor in preventing readmissions of HF patients. While the results from the study directly contradict these researchers' point of view, it posed the question if they fully understood what was being taught. This could have implied health literacy issues with HF patients and their caregivers. Education does not always breed competence. The largest percentage of patients readmitted were discharged home with caregivers, followed by those who lived alone, then those who were homeless. An additional implication posed the question if there were resources in the community that the patient could take advantage of once discharged.

**Application to Theoretical/Conceptual Framework**

From admission to discharge, it is the nurse who had developed rapport and relationship with the patient. This drives Duffy's Quality –Caring Model because the

nurse is actively integrating that caring relationship while implementing those specific evidence-based nursing interventions to achieve optimal outcomes (see Appendix E). One of the best interventions was educating the patient and their family. It is noteworthy that this was the only social factor that was 100% implemented and not a cause for readmission. This was congruent with Duffy's Quality Care Model by echoing the belief that the nurse's role in caring relationships was to engage in continuous learning and to transfer this knowledge to the patient so they can be successful at managing their care post discharge. Once the knowledge was transferred, patients asked questions about their HF and participate in their plan of care. This was known as Duffy's factor of mutual problem solving. This empowered patients to take initiative in effectively managing their healthcare. This in turn can helped to decrease the costly readmissions of HF patients.

## Limitations

There were two main limitations to this study. The sample size and the restriction of the patient population to DUH. Having a larger sample size not restricted to one organization and area could possibly have yielded a larger percentage of patients who were affected by the social factors. Also, a patient population that lived in an urban or rural area that did not have access to a Level I Trauma Center who had specialists in the HF area as well as an outpatient clinic whose focus was specifically addressing the needs of and caring for HF patients.

Other hospital organizations also did not employ social workers or case managers that could have helped with arranging appointments after discharge, providing financial help with medications, or providing the resources needed due to co-morbidities prior to discharge. The only constraint on the thesis was the limitation to it only addressing social

factors that were related to HF patient's being readmitted to the hospital. Being more generalized by asking or addressing the most common factors that cause HF readmissions versus only social factors may have yielded a higher percentage in results.

## Implications for Nursing

Nurses continue to be voted as the most trusted profession in the workforce. Patients tend to trust what nurses tell them as it relates to their healthcare journey to wellness. The significance of nurses who care for HF patients is prevention of readmission through education, specific assessments and documentation of symptomology, as well as consults to other members of the healthcare team who can assist with the goals of care. These people include, but are not limited to respiratory therapists, pharmacists, case managers, and social workers. Collaboration between these members must be ongoing with follow-up immediately after discharge.

Additional implications for future practice consisted of partnering with other nursing or hospital organizations to see what was working well or opportunities for growth that could have been resolved with that partnership for the HF patient population.

## Recommendations

Three recommendations that benefitted others in similar situations and furthered the study of this topic began with partnering with the American Association of Heart Failure Nurses (AAHFN) to see what opportunities for growth the organization had in their current nursing care. This also helped to solidify the theoretical/conceptual framework of Duffy's Quality Care Model. An additional recommendation is to partner with those in the community who provide services and resources to the HF patients. These community resources helped to identify any gaps that caused readmissions.

Finally, providing a voice for the patients to verbalize both solutions and barriers they have post discharge that could prevent readmissions.

**Conclusions**

Heart failure patients are among one of many patient populations that are readmitted to the hospital within a 30-day period. This thesis focused on several social factors that contributed to this. They included living arrangements, lack of resources such as food, cognitive, mental, or emotional factors, to include alcohol and drug abuse, and transitional care from inpatient to the outpatient setting. Each social factor yielded a small percentage of HF patients that were readmitted based on those circumstances. Education was the only social factor where 100% of the patients were educated about HF prior to their previous discharge. Overall, these social factors had a small impact on HF readmissions.

Due to the limited number of samples and having been confined to one organization for the HF population, it was difficult to predict the true impact these social factors may have had on HF patients. It proved worthy to further investigate what other organizations do, that have significant readmissions of HF patients and what opportunities contributed to their readmissions. This analysis would be the catalyst into networking and collaborating with other healthcare organizations so as to decrease the amount of HF readmissions and social factors. One also concluded that there are certainly other factors than social ones that affected a HF patient being readmitted to the hospital.
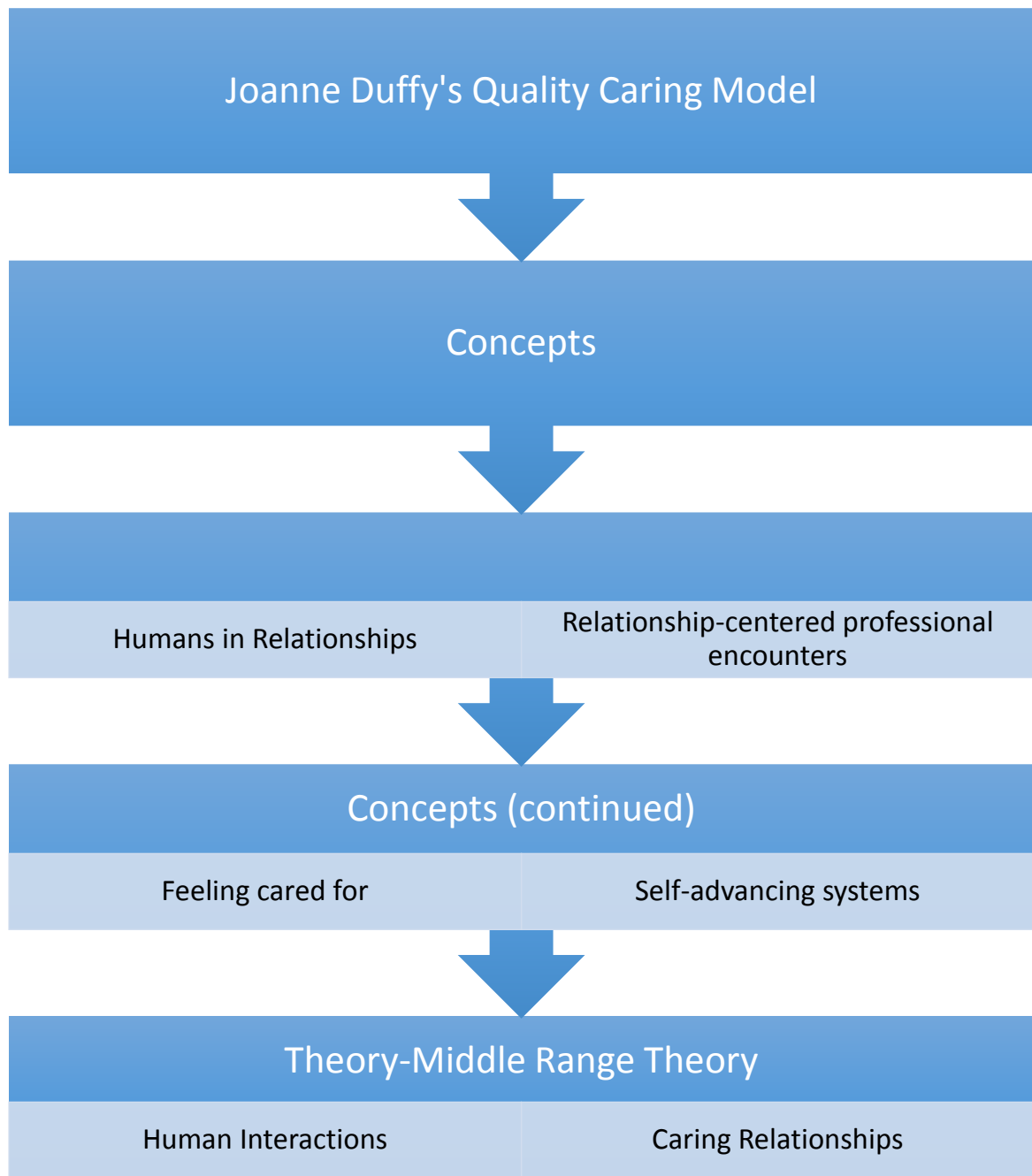
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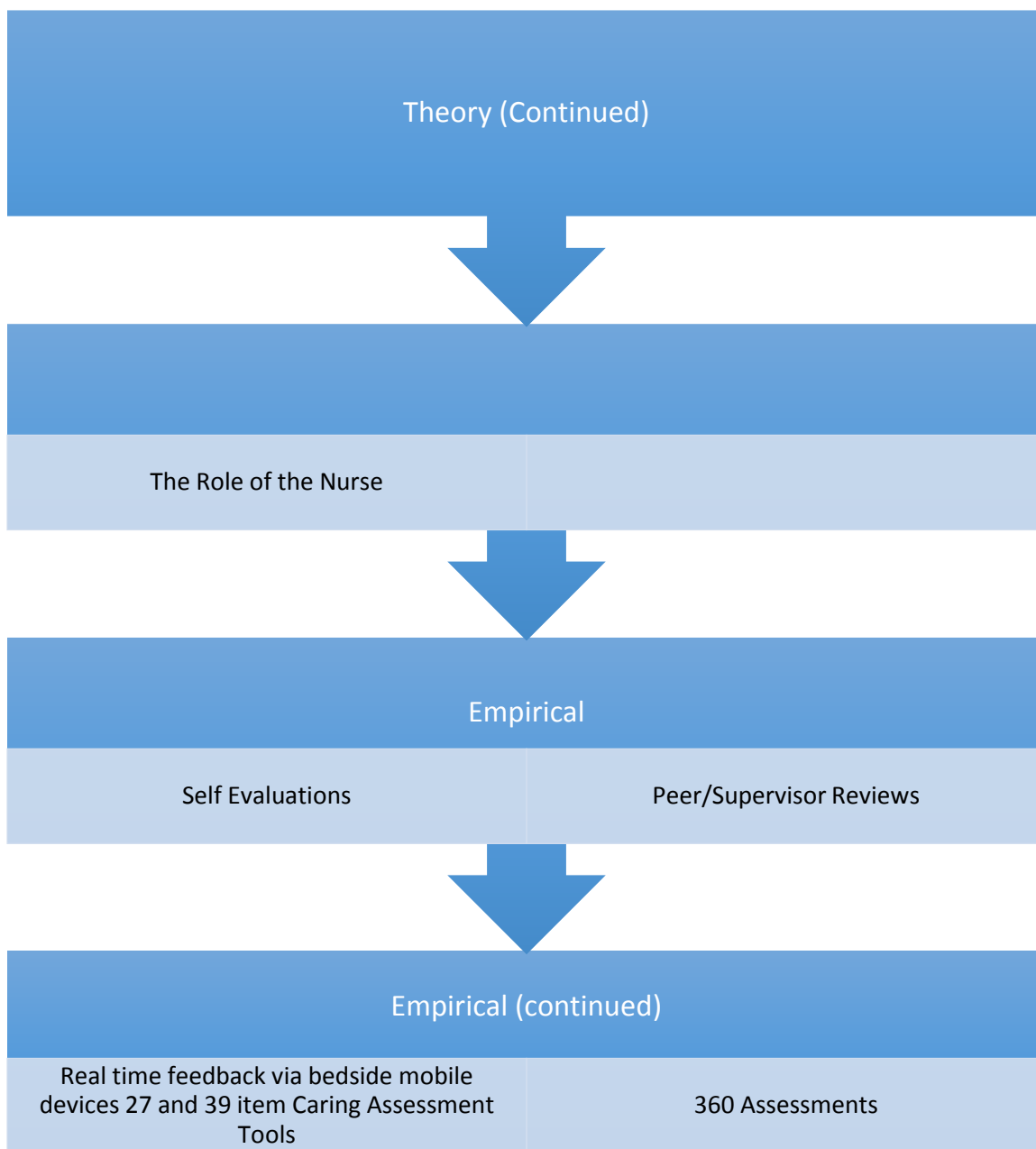
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Appendix A

Conceptual-Theoretical-Empirical Diagram

Joanne Duffy's Quality Caring Model

↓

Concepts

↓

| Humans in Relationships | Relationship-centered professional encounters |

↓

Concepts (continued)

| Feeling cared for | Self-advancing systems |

↓

Theory-Middle Range Theory

| Human Interactions | Caring Relationships |

Theory (Continued)

The Role of the Nurse

Empirical

Self Evaluations

Peer/Supervisor Reviews

Empirical (continued)

Real time feedback via bedside mobile devices 27 and 39 item Caring Assessment Tools

360 Assessments

Appendix B

Deduce

Appendix C

Duke's Protected Network

### Duke University's Protected Network for Sensitive data

Duke's Office of Information Technology (OIT) and the University's IT Security Office (ITSO) established the Protected Network as a resource for storage and analysis of Sensitive research data. The network is separated virtually from the general Duke network and has more extensive security protections. It comprises dedicated storage and virtual machines (VMs), and requires specific authorization from the Campus ITSO for access.

### Protected Network Components

The Protected Network has a dedicated VM and storage infrastructure designed to accommodate Sensitive data. A firewall and network rules separate the Protected Network from the Duke Network and Internet, preventing unauthorized inbound and outbound connections. Systems in the Protected Network comply with the University ITSO's Server Security Standards including: regular patching; removal of unneeded services; logging to a central logging infrastructure; active host-based firewall; running an antivirus program; and regular backups. Systems in the Protected Network also require multi-factor authentication.

The infrastructure is located in a Duke University secured datacenter with physical access limited to authorized Duke IT staff. All backups of the research project data are encrypted and located in the same secured data center.

Researchers accessing resources in the Protected Network are required by policy to enact the following protections on their computers accessing the Protected Network: regular patching; running an antivirus program; laptop encryption; and active host-based firewall.



Figure 1: Schematic depicting the environment

The Duke Protected Network uses (A) two-factor authentication to accept users into SSH, RDP, or VPN connections. Using Access Control Lists managed by Grouper, users are then directed to specific subnets (B) that are tailored to computational requirements of research projects. Within the subnets, individual machines can further restrict access to data or computational resources. The entire infrastructure (C) uses Grouper for authorization, from initial access to the environment (A) to individual devices within the various subnets (B). Initial authentication via SSH, RDP or VPN is multi-factor, using Duke's NetID (Kerberos & AD) and Duo.
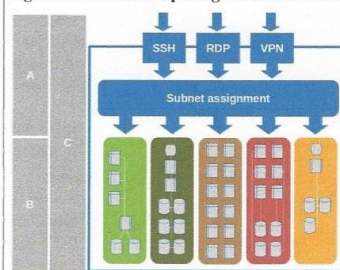
### Protected Network Access

Access to the Protected Network requires an encrypted connection through Secure Shell (SSH), Remote Desktop Protocol (RDP) or Virtual Private Network (VPN). Access requires a valid Duke NetID (user account) combined with multi-factor authentication (e.g., using Duo). The group management tool Grouper is used to control access to the Protected Network and systems within the network. Principal Investigators, or their delegates, are responsible for approving user access to their Protected Network project's groups.

### Responsibilities

Users of the Duke Protected Network accept the policies and terms of use established for that network. For each research activity, a person responsible for maintaining contractual and/or legal obligations for data protection is identified (the "data steward"). An "administrator" is also designated by the data steward to manage Grouper groups, and therefore, provision access to their project, directly. The "data steward" and the "administrator" may be the same person.

Duke University ITSO                                                          March, 2017

Appendix D

Microsoft Word Table

| SUBJECT | | A<br>1-YES<br>2-NO | B<br>1-LIVES ALONE<br>2-LIVES W/ CAREGIVERS<br>3-HOMELESS<br>4-OTHER | C<br>1-YES AND LIST WHAT WAS TAUGHT<br>2-NO | D<br>1-YES AND LIST<br>2-NO<br>3-BOTH | E<br>1-YES AND LIST FACTOR<br>2-NO | F<br>1-YES AND LIST TYPE OF ABUSE<br>2-NO | G<br>DISPO.<br>1-HOME/HH<br>2-SNF<br>3-EXP<br>4-OTHER I.E.LTAC |
|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |

Appendix E

Pie Chart

**LIVING ARRANGEMENTS**
OTHER 5%
HOMELESS 3%
ALONE 32%
CAREGIVERS 60%

**RECEIVED EDUCATION**
NO 0%
YES 100%

**FOOD INSECURITY**
YES 3%
NO 97%

**COGNITIVE/MENTAL/EMOTIONAL FACTORS**
YES 11%
NO 89%

**SUBSTANCE ABUSE/ALCOHOL/DRUG DEPENDENCE**
YES 1%
NO 99%

**DISPOSITION**
OTHER 3%
EXPIRED 21%
SNF 8%
HOME 68%