Predictors of 30-Day Hospital Readmissions Among Heart Failure Patients

Lydia Honorata Albuquerque, DNP
Department of Cardiology, University Hospital, Livingston, NJ, USA

Abstract

Heart failure is the leading cause of hospital readmissions among patients older than 65 years of age (Mozzafarian, 2016). The purpose of this quantitative, descriptive correlational research design was to investigate the relationship between self-reported functional status as measured by the New York heart failure Association (NYHA) Functional Classification and health related quality of life (HRQOL) as measured by the Minnesota living with heart failure questionnaire (MLHFQ) to 30 day hospital readmission rates among patients with Heart failure (HF). Two hypotheses were tested in this study. 1) There will be a positive correlation between increase in limitations as measured by functional status and hospital readmissions 2) There will be a positive correlation between increase in health related quality of life as measured by the Minnesota living with heart failure questionnaire (MLHFQ) to 30 day hospital readmissions. The Wilson and Clearly model guided this research. The sample consisted of 66 participants. A Pearson Chi-square was used to test the statistical support for the hypothesis. The computed chi-square p value was .044, which is under the required <.05. There is a statistical significance which supports the hypothesis that NYHA functional status classification is a predictor of hospital readmission. The average quality of life score among participants who were admitted was 85.6 while those who were not admitted had an average score 65.9. The independent sample t-test was done to test for a relationship between health related quality of life and readmission. The t values were all above 2 with p<.05. In each case those readmitted had significantly lower quality of life scores for all three measures (Physical, Emotional and other) with the mean difference shown to be statistically significant. Given the non-normal distribution of the quality of life scores, the t-test was supplemented with a Mann-Whitney U Test to test the significance of the differences in mean quality of life score by admission status. Results confirmed that there was a statistically significant difference (Mann-Whitney U=319.0; p=.008, p<0.01). A one-way ANOVA was calculated comparing the demographic variable to 30 day hospital readmission, significant difference was found between monthly income and readmission (F=2.864, p<.05) and the times participants were admitted in the hospital in past one year to 30 day readmission (F=3.333, p<.010). The results of this study provide health care providers information about predictors of 30 day readmission among participants diagnosed with HF.

Title:
Predictors of 30-Day Hospital Readmissions Among Heart Failure Patients

Keywords:
Functional status, Quality of life and readmission

References:


Abstract Summary:
Participants will understand the relationship between self-reported functional status as measured by the New York heart failure Association (NYHA) Functional Classification and health related quality of life (HRQOL) as measured by the Minnesota living with heart failure questionnaire (MLHFQ) to 30 day hospital re-admission rates among patients with Heart failure

Content Outline:
Introduction

According to data from the National Health and Nutrition Examination Survey (NHANES) (2011 to 2014), approximately 6.5 million adults in the United States have Heart failure (HF), with the prevalence increasing 46% from 2012 to 2030, resulting in more than 8 million Americans affected (CDC, 2016). There were one million hospitalizations with the diagnosis of HF in 2010 (CDC, 2012); most patients aged 65 and over. Concerning statistics show an increase rate from 23% in 2000 to 29% in 2010 (CDC, 2012); necessitating the efforts to improve care and reduce cost of hospitalization (CDC, 2014).

In 2012, it was estimated that the total costs to treat patients with HF was about $30.7 billion, with a predicted rise in total amount to be about $69.7 billion by 2030 (Mozaffarian et al., 2016). To address the high readmission rates among Medicare beneficiaries, the Centers for Medicare and Medicaid Services (CMS) implemented the Hospital Readmission Reduction Program in 2012 (CMS, 2012), which reduces payments to hospitals for HF readmissions within 30-days of discharge. The penalties increased each year by 1% in 2013, 2% in 2014, and up to 3% in 2015 (CMS, 2012; Kocher & Adashi, 2011) on all HF readmissions within 30-days of discharge, which are affecting hospitals, especially academic centers where large number of patients are underinsured (Joynt & Jha, 2013).

Identification of the Problem

Despite advances in the treatment and management of HF, it is growing to be a public health challenge associated with increasing hospitalization, health care expenditure and mortality (Mozaffarian et al., 2016). Currently there is no method to educate patients to self-report their functional class or identify their deterioration in functional class that could in turn affect their quality of life. This could help patients self-manage their care through shared decision making, improved information technology, cultural competency and evidence based quality improvement plans (Akinci & Patel, 2014). Health care providers have the potential to encourage patients to self-report their New York Heart Association (NYHA) functional class and quality of life during their hospital stay or clinic visit, when they notice any change in the disease trajectory of HF symptom exacerbation. This may result in a decrease in emergency room visits and hospital readmission.

Purpose

The purpose of this project is to examine the relationship between self-reported functional status as measured by the NYHA Functional Classification (The Criteria Committee of the NYHA, 1994) and health-related quality of life (HRQOL) to 30 day hospital re-admission rates among patients with HF. The independent variables in this study are functional status and quality of life; the dependent variable is 30-day hospital readmission rate.

A PICOT question was developed to study the correlation of NYHA Functional classification and health-related quality of life (HRQOL) to 30-day hospital readmissions. The population (P) consists of all patients with systolic and diastolic HF. The intervention (I) consists of directing patients to complete the self-reported tools, which include NYHA Functional Classification and the Minnesota living with Heart Failure questionnaire (MLHHQ) (Rector & Cohn, 2004). The comparison (C) refers to scores on the NYHA Functional Classification and HRQOL as related to 30 day hospital readmission. The outcome (O) examined is the rate of 30 day hospital readmissions. Time (T) will be measured during a three-month time frame.

Objectives

1. To measure the correlation between New York Heart Association Functional status and 30 day hospital readmissions.
2. To measure the correlation between health related quality of life and 30 day hospital readmissions
Research Question

“What is the relationship between self-reported functional status and quality of life to 30 day hospital readmission rates in patients with HF”?

The hypothesis for this study are

H1: There will be a positive correlation between increased in limitations as measured by New York Heart Failure Association functional classification and increased 30 day hospital readmissions.

H2: There will be a positive correlation between an increase health related quality of life scores as measured by the Minnesota Living with Heart failure Questionnaire (MLHFQ) and increased 30day hospital readmissions.

Review of literature

The NYHA Functional Classification is a tool that measures the functional status of the individual for example, the effect of cardiac symptoms on patients’ daily activities (The Criteria Committee, 1994; Bennett, Riegel, Bittner, & Nichols, 2002). Patients with HF develop physical disabilities because of the biological process in the body system, which results in symptoms that could be perceived differently by patients as they are also influenced by individual and environmental factors.

A retrospective study conducted to determine the outcomes of NYHA class on hospital admission (Ahmed, Aronow, & Fleg, 2006) concluded that patients with a NYHA Class III & IV diagnosis had a five times higher risk of hospitalization, and that being in this class was a strong predictor of all-cause readmission and mortality.

Holland, Rachel, Stepien, Harvey, & Brooksby (2010) in an observational study within a randomized control trial in Norfolk, United Kingdom, tested the self-assigned NYHA class among 293 adult patients with a diagnosis of HF. Patients were directed to self-assign their symptoms with the NYHA Functional Classification. The study findings concluded that there was a significant predictive value when directly assigned by patients (Holland et al., 2010). Patients rather than HCPs can be directed to self-report their functional class.

The NYHA Functional Classification measures a “comparative symptomatology at a given level of performance, defined as an individual’s ability to do activities within his or her milieu” (Ferrans et al., 2005, p.339). Patients should be able to recognize worsening functional class and seek help to prevent exacerbation that could lead to hospital readmission.

Health-Related Quality of Life (HRQOL) and Hospital Readmission

Health-related quality of life among patients with HF is a predictor that is highly related to hospitalization and mortality (Carlson et al., 2013; Lupon et al., 2013; O’Loughlin et al., 2010; Heidenreich et al., 2006; Rodriguez-Artalejo et al., 2005). It is frequently used as a measure in clinical research because physical, emotional, and social factors can be measured with a reliable and valid tool such as the Minnesota Living with Heart Failure Questionnaire (MLHFQ) (Bilbao, Escobar, Garcia-Perez, Navarro, & Quirós, 2016). In order to develop interventions and prevent readmissions among patients with HF, it is necessary to look at the influencing variables (Hwang, Liao, & Huang, 2014).

To examine the relationship of HRQOL and functional status to hospital readmission and mortality among heart failure patients, Wu, Lennie, Frazier & Moser (2016) conducted a prospective observational study among 313 patients. HRQOL was measured using the MLHFQ; functional status was measured using the Duke Activity Status Index (DASI). Emergency department visits, hospitalization, and mortality
were end points. Patients who had higher scores on the MLHQ had a risk of readmission. There was a significant relationship between HRQL and hospitalization; Hazard ratio (HR), 2.01; P=.003.

O’Loughlin et al. (2010) examined the impact of HRQOL as a predictor of readmission and mortality among 225 patients in Ireland with HF attending a disease management program on readmission rates and mortality. This retrospective study found that HROQL scores in the physical and emotional domains were predictors of all-cause emergency readmissions. (HR (Total): 1.010. 95% CI: 1.002, 1.019). It was found that 116 (52%) of patients had at least one emergency all-cause admission. The self-report tool was predictive of hospital readmission among participants.

Research design

A quantitative, correlational research design was used to examine the association between the predictor variables and dependent variables, that is Self-report New York heart failure functional status classification and health related quality of life, to 30-day hospital readmission rates among patients with HF.

Sample

A purposive sampling method was utilized as it allows the researcher to make generalizations from the sample studied (Terry, 2015). Male and female patients with a primary diagnosis of HF, ages 30 to 85 years in both inpatient and outpatient settings of a large academic health center in New Jersey were recruited. These patients had a diagnosis of systolic (Ejection fraction <40%) or diastolic heart failure (Ejection fraction >40%). Only patients with index admission for primary diagnosis of heart failure were included in the study. A total of 6 patients were recruited for this study.

Method

IRB permission was obtained from the study site. Patients were recruited from inpatient and outpatient setting of a large academic center. The researcher introduced herself to the HF patient and explained the purpose of the study to patients who volunteer to participate in the study. Only patients who meet the eligibility criteria were invited to participate in the study and asked to sign a consent. A Mini Cognitive Examination (Appendix C) was performed on these patients. Patients who did not pass the Mini-cognitive examination, were thanked for their interest in the study. Patients with scores of 3/3 and who had completed clock drawing test (CDT) received a survey packet that consisted of a demographic data sheet, the NYHA Self-report Functional Classification Tool, and the Minnesota Living with Heart Failure Questionnaire (MLHFQ). Patients who were not able to complete the questionnaire were assisted with reading the items on the tool. The patients were asked to share their phone number. On completion of the administration of the questionnaires the researcher thanked the patient for their participation in the study. The researcher made a follow-up phone call to inquire if they were admitted within 30 day from the first day of admission to the hospital. The researcher tracked the discharge dates of the patient from the EPIC system in the hospital. This data was collected from August 30th 2017 to November 1st 2017.

Instruments

The NYHA Functional Classification Tool (Appendix E), was developed by the Criteria Committee in 1928 (Servero, Lourenco, Alvelos, & Azevedo, 2011) and is a reliable and valid self-report tool that measures the functional status of patients (The Criteria Committee, 1994; Bennett, Riegel, Bittner Nicholls, 2002; Kubo et al., 2004; Servero et al., 2011). The tool was designed for clinical assessments according to classes I, II, III, IV and based on limitations in physical activities caused by cardiac symptoms that are subjective in nature. The four classes are as follows (a) Class I: no limitation of physical activity, patient is able to perform all activities without getting short of breath; (b) Class II: slight limitation of physical fatigue, palpitations, dyspnea, or angina, however, the person is comfortable at rest; (c) Class III: marked limitation of physical activity in which less than ordinary activity results in fatigue,
palpitation, dyspnea, or angina; however, the person is comfortable at rest; (d) Class IV: inability to perform any physical activity, fatigued and dyspneic at rest (The Criteria Committee of the New York Heart Association, 1994).

The Minnesota Living with Heart failure questionnaire (MLHFQ) (Rector & Cohn, 2004) is a 21-item questionnaire that includes items on HF-related physical, psychological, and social impairment. It was developed at the University of Minnesota to assess the perception of the effect of HF and its treatment on the life of patients (Rector & Cohn, 2004). The patient’s perception of such impairment is assessed on a Likert-type scale ranging from none “0” to very much “5”. Zero means there is no effect on a patient’s life; five means the item affected the patient's life very much during the past month. The total MLHFQ score is obtained by adding the scores from all 21 items (range 0-105); the higher the score, the poorer the “health-related quality of life” (HRQQL). Subscales include the summary of the impact of HF on physical dimensions constructed on the basis of eight items and evaluated with items 2, 3, 4, 5, 6, 7, 12, 13. The emotional dimensions constructed on the basis of five items will be evaluated with item 17, 18, 19, 20, 21. The rest of the items measured item 1, 8, 9, 10, 11, 14, 15, 16 the other subscales elicit information on swelling in ankle, working and earning, recreation, costing more for medical treatment, stay in hospital and side effects of treatment effects on the health related quality of life.

Findings

A Pearson Chi-square was used to test the statistical support for the hypothesis. The computed chi-square p value was .044, which is under the required <.05. There is a statistical significance which supports the hypothesis that NYHA functional status classification is a predictor of hospital readmission. The average quality of life score among participants who were admitted was 85.6 while those who were not admitted had an average score 65.9. The independent sample t-test was done to test for a relationship between health related quality of life and readmission. The t values were all above 2 with p<.05. In each case those readmitted had significantly lower quality of life scores for all three measures (Physical, Emotional and other) with the mean difference shown to be statistically significant. Given the non-normal distribution of the quality of life scores, the t-test was supplemented with a Mann-Whitney U Test to test the significance of the differences in mean quality of life score by admission status. Results confirmed that there was a statistically significant difference (Mann- Whitney U=319.0; p=.008, p <0.01). A one- way ANOVA was calculated comparing the demographic variable to 30 day hospital readmission, significant difference was found between monthly income and readmission (F=2.864, p<. 05) and a times participants were admitted in the hospital in past one year to readmissions (F=3.333, p< .010). The results of this study provide health care providers information about predictors of readmissions among participants diagnosed with HF.

Limitations

The limitation of the study was small sample size (n=66), wherein the study participants were from one geographical location, hence the findings cannot be generalized to all patients with a diagnosis of heart failure. Quality of life was determined using the Minnesota living with heart failure questionnaire (MLHFQ). This tool has 21 items and is lengthy. One question on sexual activity was a difficult item to elicit response by the patients. In future studies this item may need to be excluded, which may impact the validity of the tool.

Future Research

Based on the results of this study, a longitudinal study sample in different geographical areas would help compare the predictors of NYHA function status classification and health related quality of life as predictors of 30 day hospital readmissions. Further research studies can to done to examine the effect of education on NYHA functional classification and hospital readmissions.
A comparative study between physician assigned NYHA functional classification and patient self-reported NYHA functional status classification can be explored to examine if there is any subjectivity on assigning the NYHA functional status classification.

Implications

The study provides insights into two predictors of 30 day hospital readmissions. Based on the literature and findings of the study, NYHA functional status classification and health related quality of life scores are predictors of 30 day hospital readmission. It is important for health care providers to utilize self-reported tools to evaluate NYHA functional status and health related quality of life while patients are admitted in the hospital and in outpatient setting. The researcher found that low-income is an established predictor of 30 day hospital readmissions. Number of times participants were admitted in the past one year did have a statistical significance on hospital readmissions implies that this group of patient population would need a reengineered mechanism that would address the causes of readmission. Patients who are identified as high risk prior to discharge will need to be sent to a skilled nursing facility to prevent hospital readmissions.

Significance to Nursing

The increasing number of patients affected by HF is alarming. Various quality improvement projects by The Joint Commission (TJC) include discharge planning instructions, arranging transition of care at discharge, measuring left ventricular function, seven day follow up appointment, and evidence based prescription of medications have been implemented (TJC, 2016). Yet the efforts of this nature have not been associated with low readmission rates (Bonow et al., 2012; Joynt & Jha, 2013a; Glass, Lisk & Stensland, 2012).

The burden of reducing 30 day HF readmission rates lies in the hands of multiple stake holders such as advance practice nurses (APN) and registered nurses (RN) who play a vital role in participating in and transforming health care. The Institute of Medicine report (2010) on the Future of Nursing Leading Change and Advancing Health, states that nurses should be full partners in addressing health care challenges and in the reform of current and future issues. It is essential that nurses embrace this challenge through evidenced based research which can be translated into practice. Educating patients and offering them resources before they are discharged from the hospital could prevent progression of the disease condition and reduce readmission rates.

Advance Practice Nurses (APNs) can develop strategies to redesign the management of HF 30 day readmissions by examining the disease trajectory and providing patients with information about management across the continuum of care (Desai & Stevenson, 2012). This could include comprehensive discharge planning among patients and care givers. Collaborating with community resources such as utilization of walk-in clinics to prevent exacerbation should be explained to patients and family members at the time of discharge. APNs can utilize these tools in clinical practice that assess not only the functional status but also the quality of life which is influenced by individual and environmental factors.

Summary

The study examined the relationship between self-reported functional status as measured by the NYHA Functional Classification and health related quality of life (HRQOL) measured with the Minnesota living with heart failure questionnaire (MLHFO) to 30 day hospital readmission among patients with HF. The results demonstrated that NYHA functional status and health related quality of life were predictors of hospital readmissions. Further the study also showed that demographic data such as income and times admitted to hospitals in a year were predictors of 30 day hospital readmission. The results of this study provide health care providers with information on the importance of evaluating NYHA functional status classification and health related quality of life scores in screening health risk for readmission, further the
times the patient admitted in the last one year and income are important to elicit as risk factors for 30 day hospital readmissions.

First Primary Presenting Author
Primary Presenting Author
Corresponding Primary Presenting Author
Lydia Honorata Albuquerque, DNP
University Hospital
Department of Cardiology
Nurse Practitioner
Livingston NJ
USA

Professional Experience: 2013-present Thomas Edison state College, New Jersey Faculty contract (online) 2012- 2015 Rutgers University, New Jersey Adjunct faculty 2009 -2011 Farleigh Dickenson University, Teaneck, NJ Adjunct Faculty 1999 -2004 Bharti Vidyapeeth Deemed University,Pune, India Associate Professor 1989- 1998 Pune University, India Assistant Professor 1985-1987 School of Nursing, Mumbai, India Instructor

Author Summary: Dr. Albuquerque has been a registered Nurse since 1983 and Cardiology Nurse Practitioner since 2012. She is a contract faculty at the W Cary Edward, school of Nursing, Thomas Edison state college. Dr. Albuquerque has many presentations, papers, and posters to her credit. She is a member of the American Academy of Nurse Practitioners as well as the education committee member of the American Association of Heart Failure Nurses.