PATIENT’S SELF-REPORTED FUNCTIONAL STATUS AND HEALTH RELATED QUALITY OF LIFE: PROGNOSTIC PREDICTORS FOR 30 DAY HOSPITAL READMISSIONS AMONG HEART FAILURE PATIENTS

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Background

- Heart failure affects 6.5 million adults in the United States (CDC, 2016)
- Incidence is predicted to increase 25% by 2030 (Mozzafarian et al., 2016)
- Cost of treating patients with Heart failure is estimated to be 69.7 billion by 2030 (Mozzafarian et al., 2016)
- One million hospitalizations with the diagnosis of HF in 2010 (CDC, 2012)
- The Centers for Medicare and Medicaid Services (CMS) implemented the Hospital Readmission Reduction Program in 2012 (CMS, 2012)
- The penalties increased each year by 1% in 2013, 2% in 2014, and up to 3% in 2015 (CMS, 2012; Kocher & Adashi, 2011)
PURPOSE
To examine the relationship between self-reported functional status as measured by the New York Heart Association (NYHA) functional classification and health related quality of life as measured by the Minnesota Living with heart failure questionnaire (MLHQ) to 30 day hospital re-admission rates among patients with Heart failure.

RESEARCH QUESTION
What is the relationship between self-reported functional status and health quality of life to 30 day hospital readmission rates among patients with HF’”?
OBJECTIVES

❖ To correlate self-reported NYHA functional class to 30 day hospital readmission rates.
❖ To correlate self-reported health-related quality of life to 30 day hospital readmission rates.

HYPOTHESIS

❖ H1: There will be a positive correlation between increase in limitations as measured by functional status and 30 day hospital readmissions.

❖ H2: There will be a positive correlation between increase in health related quality of life challenges as measured by the Minnesota Living with heart failure questionnaire (MLHQ) and 30 day hospital readmissions.
Operational Definitions

- **Functional Status**
  “An individual’s ability to do activities within his or her regular milieu, an ability that may be limited by a variety of physical, personal, environmental, or social factors, including symptoms” (Bennett, Riegel, Bittner, & Nichols, 2002, p. 264). This is measured by self-report scores of NYHA functional classification.

- **Health Related Quality of Life (HRQOL)**
  Refers to “subjective well-being, expressed as how satisfied or dissatisfied each patient is with areas of life as a whole” (Ferrans et al., 2005, p.340). Life satisfaction is determined by various factors such as health and functioning, socioeconomic status, psychological and spiritual well-being and family support (Ferrans et al., 2005).
Operational Definitions

- **Hospital Readmission Rates:** as defined by CMS (2012) refers to an admission to the hospital within 30-days of discharge from the same or another hospital, which will be measured by retrospective chart review. Patients will be called and asked if they were hospitalized in any of the other local facilities in the area.

- **Index hospitalization:** as defined by CMS (2016) refers to hospitalization with a primary diagnosis of heart failure not preceding by another hospitalization for heart failure in the last 30 days from the date of present admission.
Theoretical Framework

- Conceptual model developed by Wilson and Clearly used to guide the research study
- The model discusses Biological 
  Physiological 
  Symptom status 
  Functional status 
  Quality of life as health outcomes

The outcome measured in this study is the 30 day hospital readmission rates among patients with Heart failure.
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.
Review of Literature

- Holland, Rachel, Stepieen, 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.
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 MLHFD; 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 MLHFD had a risk of readmission. There was a significant relationship between HRQOL and hospitalization; Hazard ratio (HR), 2.01: P=.003.)
Review of Literature

- 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 HRQOL 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.
Methodology

Research Design:
A quantitative, descriptive correlational research design was used to examine the correlation between the predictor variables, functional status and quality of life, to 30-day hospital readmission rates among patients with HF.

Sample:
Seventy participants were recruited to the study, of which four participants were excluded due to mortality, lack of contactable telephone number or having opted for palliative care. The remaining sample of 66 patients were incorporated into the study.
Inclusion and Exclusion criteria

**Inclusion Criteria:**
- Male and female patients ages 30 years to 85 years
- Systolic and diastolic HF patients with index admission of HF
- Able to read and write English
- Obtain a 3/3 on word recall and able to draw the clock on the Mini-Cognitive scale
- Have access to telephone services

**Exclusion criteria**
- Exhibit cognitive impairment
- Transferred to another acute care facility
- Hospice care
Methods

Protection of Human Subjects

- IRB approval from WPUNJ and University hospital
- Informed consent & right to withdraw
- Confidentiality & anonymity
- Risk to the subjects minimal with benefit to improve quality of life and functional status to decrease readmissions
Data Collection Procedures

- The heart failure list was accessed from the Epic Electronic Health record (A shared patient list). This list was generated from all patients admitted to the telemetry unit and the Cardiac care unit.

- To access the outpatients, the investigator obtained the patient scheduled list from the outpatient HF visit appointment list. (Available on the Ambulatory Care center visit list on Epic Electronic health record)

- Participants that met the eligibility criteria were approached and the researcher introduced herself and explained the purpose of the study.

- The Mini-cognitive examination was administered. Patient who score a word 3/3, and able to complete the clock drawing test were asked to consent.

- Patients were then be directed to complete the demographic data sheet, Self-report NYHA classification and Minnesota living with heart failure questionnaire.

- Post discharge phone call was made to inquire if the patient was readmitted within 30 days of discharge.
Instruments used

- **NYHA functional status classification tool** (The criteria Committee, 1994)
  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.

- **Minnesota Living with heart failure Quality of Life questionnaire** (Rector & Cohn, 2004)
  - 21 item tool (scores range from 0-105)
  - Likert-type scale ranging from none “0” to very much “5”
  - Measures Physical (8 items), emotional (5 items), Other (8 items)

- Mini-cognitive examination tool
- Post discharge phone call for 30 day readmission
- Demographic data sheet
Data Analysis

- Descriptive statistics included age, gender, marital status, ejection fraction, race, number of years diagnosed with HF, marital status, income, family structure and support, co-morbid conditions, frequency of admissions in the last one year.

- Inferential statistics included chi-square to test the relationship between NYHA functional status classification and the 30 day hospital readmissions.

- A t-test was done to test the relationship between health related quality of life and 30 day hospital readmission rates.

- 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 30 day hospital readmission rates.

- A one-way ANOVA was calculated comparing the readmission scores to age, gender, race, monthly income, education, times admitted in last one year, help at home, ejection fraction, marital status & years diagnosed with HF.
Demographics

- The age of the participants ranged from age 20 to 80 with a mean of 55 years.
- The study sample consisted of 68% males and 32% females.
- A majority of the participants (59%) were African American, with remaining primarily Caucasian (16.7%) and Hispanic (16.7%).
- The sample consisted of 66 participants of whom 68.2% (45) had Heart failure with reduced Ejection fraction (HFrEF) and 31.8% (21) participants had Heart failure with preserved Ejection fraction (HFpEF).
- The education level varied with 41% (n=27) having completed a high school education and 23% (n=15) having less than a high school education; the remaining 33.6% had completed at least an associate’s degree.
- Forty-four percent (n=29) of the participants were single, 18.2% (n=12) were married, 21.2% (n=14) divorced and 16.7% (n=11) widowed.
- A majority of the participants 66.6% had a monthly income of less than $1,000.
Demographics

- All participants had more than one co-morbid condition. 92.4% (n=61) had a diagnosis of hypertension and 59.1% (n=27) had a diagnosis of diabetes.
- When asked about family structure and support, 93.9% (n=62) of the participants had someone that they could depend on for help, but four did not (two of the patients were homeless and lived in a shelter and the other two simply stated that they had no one they could depend upon. The sources of support included children (33.3%), significant others (45.5%) and a spouse (15.2%).
- The largest section of the group 78.8% (52) had been diagnosed with heart failure for 1 to 3 years and had an EF of less than 40% and 56% (37) had a self-reported functional status of NYHA level III.
- A majority of the participants 69.6% (46), scored as functional class III, which corresponds to feeling tiredness and shortness of breath with less than ordinary activity while walking on flat surface.
- 28.7% (19) were readmitted two times in one year 21.2 % (14) were readmitted three times, and 27.2% (18) were readmitted more than 4 times.
Cross tabulation of NYHA functional status and 30 day hospital readmission

<table>
<thead>
<tr>
<th>Variable</th>
<th>Value</th>
<th>Level I</th>
<th>Level II</th>
<th>Level III</th>
<th>Level IV</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Readmission</td>
<td>NO</td>
<td>3 (75.0%)</td>
<td>8 (61.5%)</td>
<td>13 (28.3%)</td>
<td>2 (66.7%)</td>
<td>26 (39.4%)</td>
</tr>
<tr>
<td></td>
<td>YES</td>
<td>1 (25.0%)</td>
<td>5 (38.5%)</td>
<td>33 (71.7%)</td>
<td>1 (33.3%)</td>
<td>40 (60.6%)</td>
</tr>
</tbody>
</table>

Sixty percent (40) participants were readmitted within 30 days of discharge from the hospital across all NYHA levels.
## Health related quality of life scores

<table>
<thead>
<tr>
<th>MLHQ scales items</th>
<th>Total</th>
<th>Score mean</th>
<th>Std Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical factor Response score</td>
<td>40</td>
<td>32.43</td>
<td>10.696</td>
</tr>
<tr>
<td>Emotional factor, Score</td>
<td>25</td>
<td>17.33</td>
<td>7.526</td>
</tr>
<tr>
<td>Other</td>
<td>40</td>
<td>28.32</td>
<td>9.928</td>
</tr>
<tr>
<td>Overall MLHQ ( mean) Total score</td>
<td>105</td>
<td>77.87</td>
<td>26.32</td>
</tr>
</tbody>
</table>

The overall MLHQ mean was 77.9 with a standard deviation of 26.32, which indicates that participants in this study had poor quality of life. The scores on subscales measuring the Physical factors, Emotional factors, and other factors were high which again indicates poor quality of life experienced by the study participants across all areas of the tool.
Health related Quality of life scores between groups

<table>
<thead>
<tr>
<th>Hospital readmission</th>
<th>n</th>
<th>Mean</th>
<th>Std Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality of life</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>26</td>
<td>65.89</td>
<td>32.18</td>
</tr>
<tr>
<td>Yes</td>
<td>40</td>
<td>85.68</td>
<td>18.25</td>
</tr>
</tbody>
</table>

The analysis examined the association between quality of life and hospital readmission status. Among those who were admitted, the average Quality of life was 85.68 while those who were not admitted had an average score 65.89.
Inferential Statistics

Relationship between NYHA functional classification status and 30 day readmissions

<table>
<thead>
<tr>
<th>Pearson Chi-square</th>
<th>Value</th>
<th>df</th>
<th>Asymptomatic significance (2 sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8.117</td>
<td>3</td>
<td>.044*</td>
</tr>
</tbody>
</table>

*Significant P<.05

The Pearson chi-square was used to test the hypothesis, there was a relationship between NYHA functional classification and 30 day readmission. The computed chi-square p value was .044 (p<.05). There was a statistical significance which supports the hypothesis that NYHA functional status classification is a predictor of hospital readmission.
Relationship between Quality of life and 30 day readmissions

<table>
<thead>
<tr>
<th>Variable</th>
<th>T-test for Equality of Means</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>t</td>
<td>Sig (2 tailed)</td>
</tr>
<tr>
<td>Physical factor</td>
<td>-2.411</td>
<td>0.021*</td>
</tr>
<tr>
<td>Emotional factor</td>
<td>-2.545</td>
<td>0.014*</td>
</tr>
<tr>
<td>Other factor</td>
<td>-3.105</td>
<td>0.004*</td>
</tr>
</tbody>
</table>

Significant p<.05

Sample t-test that was done to test for a relationship between health quality of life and readmission. The t values were all above 2 (p <.05). In each case, those readmitted had significantly worse quality of life scores for all three measures with the mean difference shown to be statistically significant.
## Relationship between Quality of life and 30 day hospital readmissions

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mann-Whitney</th>
<th>Sig (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical factor</td>
<td>348</td>
<td>.021*</td>
</tr>
<tr>
<td>Emotional factor</td>
<td>312</td>
<td>.005*</td>
</tr>
<tr>
<td>Other factors</td>
<td>300</td>
<td>.004*</td>
</tr>
<tr>
<td>Overall quality of life</td>
<td>319</td>
<td>.008*</td>
</tr>
</tbody>
</table>

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)
## Relationship between readmission and demographic variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>F statistics</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>0.545</td>
<td>.772</td>
</tr>
<tr>
<td>Gender</td>
<td>0.765</td>
<td>.470</td>
</tr>
<tr>
<td>Race</td>
<td>1.109</td>
<td>.361</td>
</tr>
<tr>
<td>Monthly income</td>
<td>2.864</td>
<td>.031*</td>
</tr>
<tr>
<td>Education</td>
<td>2.278</td>
<td>.058</td>
</tr>
<tr>
<td>Times admitted in one year</td>
<td>3.333</td>
<td>.010*</td>
</tr>
<tr>
<td>Help at home</td>
<td>0.195</td>
<td>.660</td>
</tr>
<tr>
<td>Ejection fraction</td>
<td>0.021</td>
<td>.885</td>
</tr>
<tr>
<td>Marital status</td>
<td>0.931</td>
<td>.431</td>
</tr>
<tr>
<td>Years diagnosed with HF</td>
<td>1.861</td>
<td>.129</td>
</tr>
</tbody>
</table>

*Significant p<.05
Relationship between readmission and demographic variables

- A one-way ANOVA was calculated comparing the readmission scores to age, gender, race, monthly income, education, times admitted in last one year, help at home, ejection fraction, marital status, years diagnosed with HF.
- A significant difference was found in two of the demographic variables. A significant difference was found between monthly income and readmission (F=2.864, p<.05) and also between times admitted in the hospital in past one year to readmissions (F=3.333, p<.010).
Conclusion

Discussion

- Results of this study was similar to previous research studies
- This study focused on the underserved population of the inner city
- This study was the only study that found a relationship between income and number of times readmitted to 30 day hospital readmission

Limitations

- The use of purposive sample and small size of the sample (n=66) restricted the researcher to generalize the findings.
- Furthermore, the participants were limited to inner city of Newark, NJ and hence the findings cannot be generalized to all patient with a diagnosis of heart failure.
- This tool has 21 items and is lengthy. And one question on sexual activity response could have affected the overall score and should be deleted from future studies.
Conclusions

Implications for Practice

- A gap still exists in our health care system.

- 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.

- Efforts to address low income and number of times admitted as risk factors during hospitalization needs to be explored.
Conclusions

Future research:

- This study should be conducted using a larger sample size and in a more geographically diverse area.
- Comparative study between physician assigned NYHA functional classification and patient self-reported NYHA functional status classification.
- Explore the difference in admission rates among HFrEF and HfpeEF.
- Examine the effect of education on self report tools on 30 day day hospital readmission.
- Explore factors that are causes of high readmission among patients with HF.
- Examine the relationship between medication compliance and hospital readmissions as a predictor.
Conclusions

• 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 (MLHFQ) to 30 day hospital readmission among patients with HF.
• The results showed that NYHA functional status and health related quality of life were predictors of hospital readmissions
• Further the study also showed that demographic data like income and times admitted to hospitals in a year were predictors of 30 day hospital readmission
References


