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# Congestive Heart Failure Readmission Rates with Relation to Patient Compliance

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**Congestive Heart Failure**
**Readmission Rates with Relation to Patient Compliance**

A thesis presented
by

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**Abstract**

The purpose of this study is to examine the relationship between patient compliance with medical recommendations for congestive heart failure and readmission rates. The study sought to examine what elements of patient teaching the individuals retained, as well as their perception of how well they adhered to the recommendations. This study examines individuals who have been admitted to the hospital on at least two occasions with the primary diagnosis of congestive heart failure. Each participant was asked to complete one qualitative survey and one quantitative survey that were used to identify daily habits, as well as level of compliance, to established congestive heart failure care recommendations. Results showed that patients were largely compliant with instructions to take rests throughout the day and when short of breath, but were primarily non-compliant with recommendations to exercise regularly.

**Introduction and Literature Review**

Congestive heart failure accounted for 1 million hospitalizations in 2010 in the United States and is the leading cause of hospitalization among adults greater than 65 years of age (Hall, Levant, & DeFrances, 2012). Although improvements in medical treatment have been made, hospital readmission rates remain high, with greater than 50% of patients being readmitted within the first 6 months of discharge (Ross et al., 2010). Congestive heart failure accounted for 12.5% of heart disease deaths in Arkansas in 2011 (Arkansas Department of Health, 2012) and delivered 30-day readmission rates that fell at or above the national average (Centers for Medicare & Medicaid Services, 2014). Lowering readmission rates is vital to providing improved patient safety as well as lowering health care costs. Recent emphasis on evidence-based practice, with use of

quality measures or core measures for specific diseases is now required by the Joint

Commission on Accreditation of Healthcare Organization (JCAHO). These core

measures include assessment of left ventricular function (LVF), prescription of

angiotensin-converting enzyme inhibitor (ACEI) and provision of smoking cessation

advice or counseling. Additionally, health care providers have been called upon to

provide discharge education covering activity, weight, diet, discharge medications,

follow-up appointments and worsening symptoms.

    The study hospital ranks at or above the state and national average in several

quality measures, however the 30-day readmission rate for CHF is 23.0%, which is below

the national average (25%) (Centers for Medicare & Medicaid Services, 2014). This

quality improvement project aims to determine whether time to readmission among

patients with heart failure is associated with compliance with the six core heart failure

discharge measures.

    There is typically no cure for CHF, but it is possible to live a full and enjoyable

life if the condition is properly managed with heart failure medications and healthy

lifestyle changes (About Heart Failure, 2015). The key to this, up until now, has been

patient education. Healthcare providers believed that if they were able to provide their

patients with the proper information, behavioral changes would be adopted. However

with the establishment of new legislature that hones in on readmission rates, health care

workers are being forced to acknowledge whether or not patient education is having a

significant impact. It is becoming evident that while advice on improving life styles is

abundant, patient compliance is not.

Effective 2012, the Center for Medicare and Medicaid Services (CMS) is required to reduce payments to hospitals with excess readmissions for patients with various conditions- one of which is congestive heart failure. (Centers for Medicare & Medicaid Services, 2015). Readmission is defined by the act as "an admission to a subsection (d) hospital within 30 days of a discharge from the same or another subsection (d) hospital." (Centers for Medicare & Medicaid Services, 2015). Along with this definition comes methodology to determine what an excessive readmission ratio is, as well as methodology to determine and adjust for risk factors. When analyzing a hospital's case mix, the CMS takes into consideration factors such as age and co-morbidities to adjust expectations and offer a "fair playing field." (QualityNet, 2015) Readmissions may be attributed to a variety of factors including premature hospital discharge, inadequate teaching for the patient and family, or poor care transitions.

Currently, there is not an overwhelming amount of research available to correlate the relationship between risk-standardized mortality rates (RSMR) and risk-standardized readmission rates (RSRR). This relationship would help to clarify the impact of a law that penalizes hospitals for excessive readmissions. Some opposition to the legislature argues that interventions to decrease mortality rates will increase readmission rates because it creates a pool of higher-risk patients. This in itself is not necessarily bad, as it is allowing for patients to sustain a longer life. However the likelihood of that patient being readmitted has now increased as compared to an individual who has not yet required such an intervention. In one study conducted to examine this relationship, researchers looked at the relationship between RSMR and RSRR for patients with acute myocardial infarction, pneumonia, and heart failure. The results of their study showed no conclusive

relationship between RSMR and RSRR for patients with acute myocardial infarction or pneumonia, but did determine a significant negative linear relationship for heart failure patients (Krumholz et al., 2013).

With the threat of withholding portions of Medicare reimbursement, hospitals and researchers have made some effort to examine their current practices. Out of 43 studies aimed at analyzing interventions to reduce readmissions, only 16 were declared effective, and no single intervention was consistently tied to effectiveness of reducing readmissions (Cummings, 2013). In another study examining the effect of evidence-based interventions on readmission rates in a community setting, evidence suggests that stand-alone community hospitals may be unable to prevent readmissions despite evidence-based interventions. However the study determined that better collaboration between hospitals and community-based providers is necessary to ensure consistent care and teaching after patients have been discharged (Linden & Butterworth, 2014). This emphasis on continuity of care opens a window for nursing interventions. A nurse-led multidisciplinary approach to interventions can improve the quality of life of patients while also reducing hospital use and medical costs (Rich et al., 2005). While progress has been made to determine effective patient teaching, much of the research available lacks consistency. It is clear that further research in this area is necessary in order to determine trends as well as solutions.

In order to lower readmission rates, it is necessary to properly educate heart failure patients about their condition and the lifestyle changes that it demands. Patient compliance is key to successful adoption of changes and several researchers have begun to examine how to best influence patient compliance. In a study conducted by Emory

University, researchers looked at the impact of incorporating family into patient teaching of heart failure. While the study reflected that family interventions were beneficial to the client, it served more to point out the areas that require further investigation. Topics such as family functioning, family support, problem solving, communication, self-efficacy, and caregiver burden with relation to patient compliance are all important areas to focus on in future research (Dunbar, Clark, Quinn, Gary, & Kaslow, 2008).

Interventions that are currently in place to improve overall health of patients with CHF and reduce readmission rates come at both the policy level, and individual responsibility. Programs that are funded by the Center for Disease Control within the state health department are aiming to change policies and systems in health care, work site, school, and community settings. These changes include monitoring the incidence of CHF diagnoses, as well as encouraging programs that promote physical activity and healthy eating (Centers for Disease Control, 2013). Meanwhile, the American Heart Association provides a heavier emphasis on personal responsibility. Currently, the AHA provides helpful tools for patients with CHF such as trackers and logs, tips to avoid the flu and pneumonia, personal stories to serve as encouragement, and brochures that explain common obstacles faced by patients with CHF, along with solutions. Trackers can record everything from blood pressure, cholesterol, weight, angina, and food intake (American Heart Association, 2015).

The importance of continued research in the field of heart failure cannot be stressed enough. Statistics are mounting concerning readmission rates for heart failure patients, and with that comes a demand for research to learn how to control them. As studies are compiling, the holes become more evident. Substantial information exists

about how to care for an individual suffering from heart failure. The issue at hand is how to deliver that information so that patients will fully embrace it, and providing themselves and the hospitals with better outcomes.

**Methodology**

This quality improvement project was conducted following approval by the University of Arkansas Institutional Review Board and study hospital's Quality Improvement Department. All patient information was de-identified according to Health Insurance Portability and Accountability Act (HIPAA). All patients over the age of 18 years who were readmitted to the cardiology unit with the primary diagnosis of congestive heart failure were eligible to enroll in the study. The researcher obtained informed consent from each patient prior to performing the interview and medical records review. Each patient was given a random case number which was matched with the medical records review and corresponding patient interview. Information obtained from medical records included gender, age, marital status, illness duration, and left ventricular ejection fraction.

This descriptive study examines the contributing factors resulting in readmission of the CHF patient within 30 days of their previous hospitalization.  Patients were asked to complete the European Heart Failure Self-Care Behavior Scale. Additionally, open-ended questions were asked of the patient to help identify barriers in compliance with the discharge instructions. After obtaining consent, the researcher administered two surveys to each patient. The surveys were administered by paper and pen during the patients readmission stay in the study hospital. Patients were asked to complete the survey and

return both forms to the researcher.  The researcher was available throughout survey administration to answer any questions from the patient.

**Analysis**

The European Heart Failure Self-care Behavior scale (EHFScB-9) is comprised of 12 items rated on a 5-point *ordinal* scale between 1 (I completely agree) and 5 (I completely disagree) The item stems are: 1) I weigh myself every day; 2) If I get short of breath, I take it easy; 3) If my shortness of breath increases, I contact my doctor or nurse; 4) If my feet/legs become more swollen than usual, I contact my doctor or nurse; 5) If I gain 2 kg (5 lbs) in 1 week, I contact my doctor or nurse; 6) I limit the amount of fluids I drink (not more than 1.5-2 L/day) (8 cups/day); 7) I take a rest during the day; 8) If I experience increased fatigue, I contact my doctor or nurse; 9) I eat a low salt diet; 10) I take my medication as prescribed; 11) I get a flu shot every year; 12) I exercise regularly (Jaarsma, Martenson, & Dracup 2013).

Descriptive statistics (frequencies and percentages) were used to analyze the data. Since the items were ordinal, we presented the median as a measure of central tendency, as well as interquartile ranges as a measure of variability. In addition, we computed a composite scale of the 9 items. Previous studies have found that most items had a positively skewed distribution (Jaarsma et al., 2009). Therefore, for the composite scale, we also present median and interquartile ranges.

**Results/Discussion**

Data for this research was collected between September 2014 and December 2014. The total sample size consisted of ten individuals readmitted to the study hospital with the diagnosis of congestive heart failure. Surveys were conducted during the patients

readmission hospital stay. The surveys evaluate level of perceived compliance to medical

recommendations for self-care following their diagnosis. The survey used a 1-10 scale to

rate compliance (Appendix A), as well as open-ended questions to gather information

about daily habits (Appendix B). The qualitative and quantitative data were merged in

order to identify themes.

The participants ranged in age from 29 to 80 years old. The mean age was 52.2

and the median age was 54. Eighty percent of the participants were male and twenty

percent female. Of the respondents, 70% were married and 30% were single. The length

of time since diagnosis of CHF ranged from one week to seven and a half years.

The left ventricular ejection fraction of each patient was recorded upon admission

and ranged between 20% and 55% with a mean of 42% (SE $\pm$ 4.16) (Table 1) Sixty

percent of patient ejection fractions were below the normal range of 50%.

Table 1

| Patient Ejection Fraction $M$= 42 (SE 4.16) | Frequency | Percent (%) | Cumulative Percent (%) |
|---|---|---|---|
| 20% | 1 | 10.0 | 10.0 |
| 25% | 1 | 10.0 | 20.0 |
| 35% | 2 | 20.0 | 40.0 |
| 40% | 1 | 10.0 | 50.0 |
| 45% | 1 | 10.0 | 60.0 |
| 55% | 4 | 40.0 | 100.0 |
| Total | 10 | 100.0 | |

Table 2 displays various activities regarding self-care of a patient diagnosed with congestive heart failure. The percentage recorded represents the number of participants in this study that reported complete compliance with each activity- indicating which activities are of greatest patient compliance. The highest percentage (90%) of compliance was related to self-care when becoming short of breath although interestingly, only 40% of patients responded that if short of breath they would contact their physician or nurse. When asked in an open-ended manner what action would be taken if the individual experienced worsening of symptoms, 40% reported that they would call their doctor, 30% said they would go to the Emergency Department, 20% of participants would call 911, and 10% would take no action at all. Exercising daily received the lowest percentage (20%) compliance from patients.

Table 2

| Patient Activity | Percentage of Respondents Reporting 100% Compliance |
|---|---|
| "I weigh myself daily" | 60% |
| "If I get short of breath, I take it easy" | 90% |
| "If my shortness of breath increases, I contact my doctor or nurse" | 40% |
| "If my feet/legs become more swollen than normal, I contact my doctor or nurse" | 60% |
| "If I gain 5 lbs in one week, I contact my doctor or nurse" | 70% |
| "I limit the amount of fluids I drink (no more than 8 cups/day)" | 50% |
| "I take a rest during the day" | 70% |
| "If I experience increased fatigue, I contact my doctor/nurse" | 40% |
| "I eat a low salt diet" | 50% |
| "I take my medications as prescribed" | 60% |
| "I get a flu shot every year" | 50% |
| "I exercise regularly" | 20% |

Figures 1-3 further break down the participants' reports of daily activities and group participants' responses based up the individuals' left ventricular ejection fraction. The lower the patient's ejection fraction is, the poorer the function of their heart. Results of this study indicated that patients are very compliant with "taking it easy" when short of breath, but less unanimous about actions taken if shortness of breath increases. Figure 3 represents patient compliance with their prescribed medication regimen- also broken down by ejection fraction. Those participants with the highest and the lowest ejection fractions reported complete compliance with taking their prescribed medications, while those with ejection fractions that fell in the middle range reported less consistency. However, when asked in the form of an open-ended question, 70% of participants reported never missing non-PRN medications throughout the week.

The area of least compliance is regular exercise- only 20% of study participants reported engaging in regular physical activity. Results from the open-ended question survey further confirmed the lack of exercise by revealing that 40% of patients do not engage in any intentional physical activity during the week at all. Of those that did exercise at least once a week, 66% reported that their physical activity did not exceed 30 minutes.
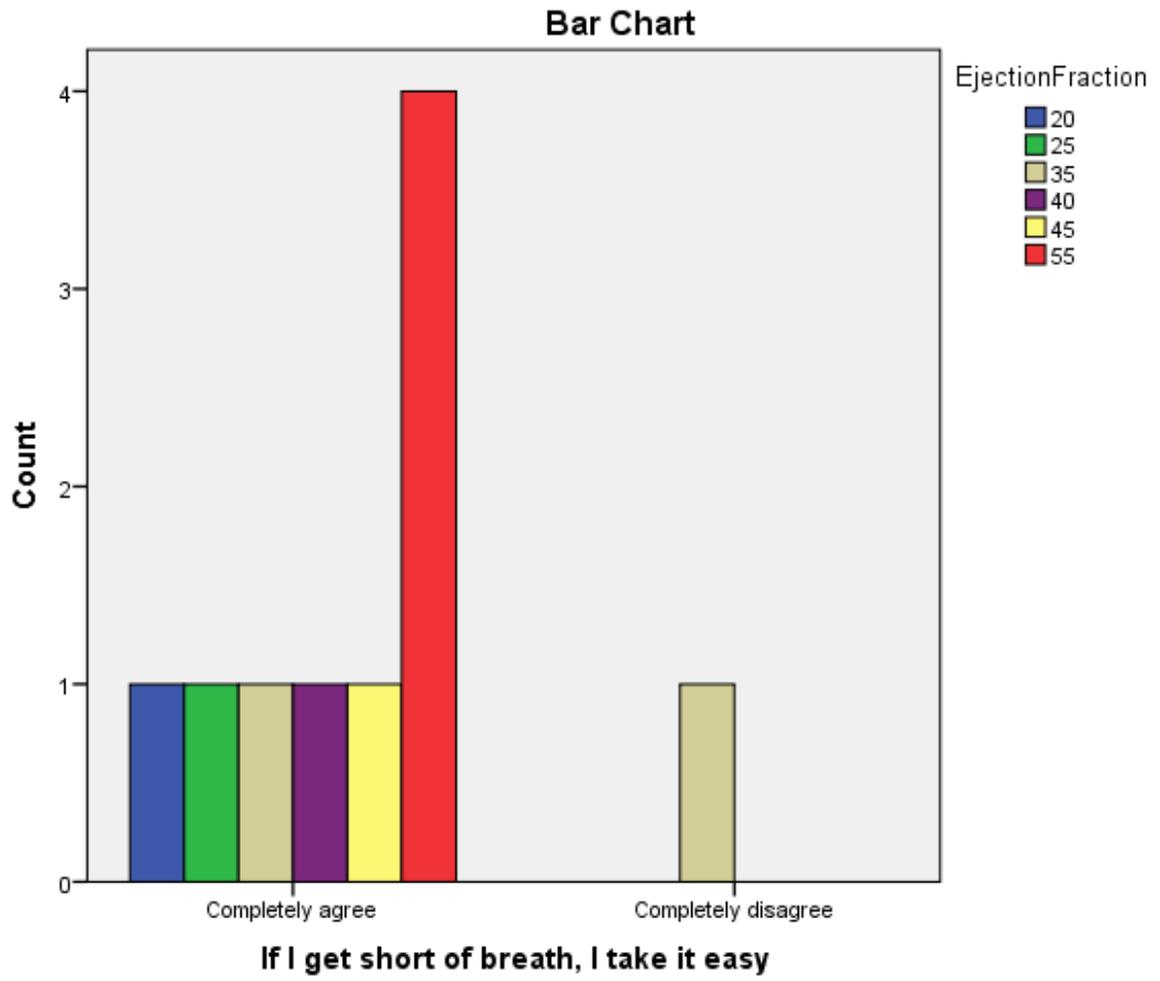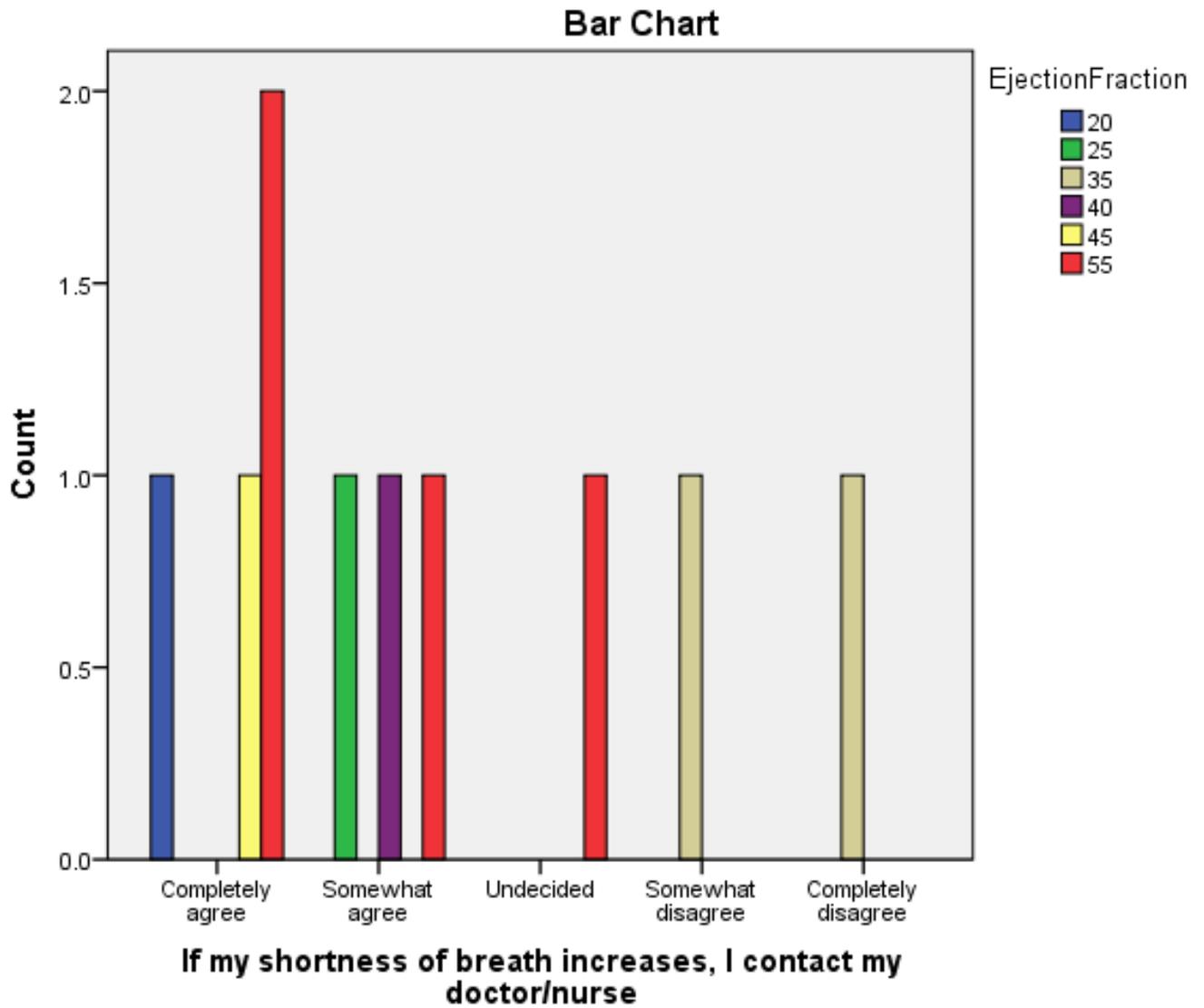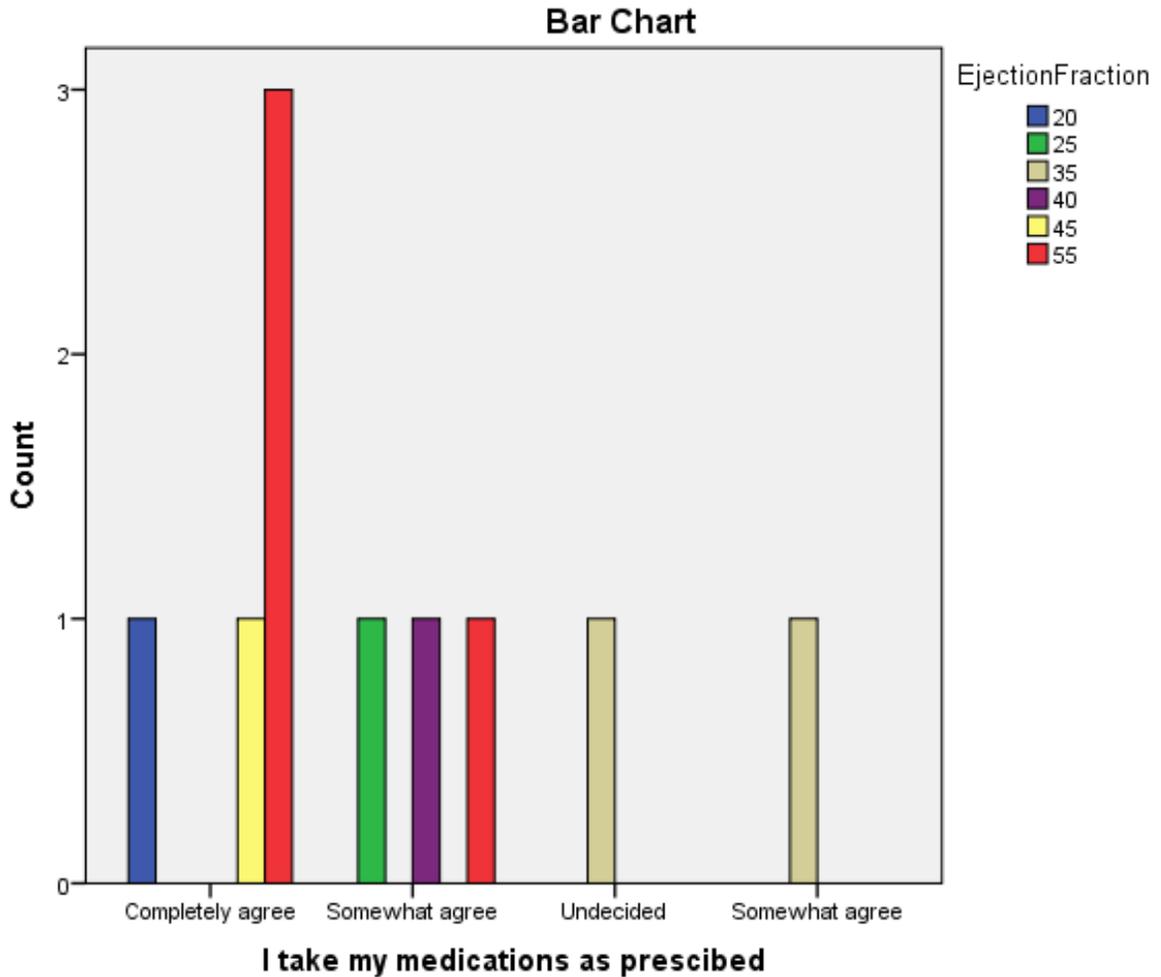
Figure 1



**Bar Chart**

EjectionFraction
- 20
- 25
- 35
- 40
- 45
- 55

If I get short of breath, I take it easy

Figure 2

Figure 3



**Bar Chart**

*I take my medications as prescibed*

EjectionFraction
- 20
- 25
- 35
- 40
- 45
- 55

**Limitations**

A limitation of this study was the small sample size. It is important to recognize

that data obtained from this study may not be applicable to all patients diagnosed with

CHF. Although data is limited, it does reflect themes in patient compliance. This study

would be very useful as a base for future research and to serve as complimentary support

to existing studies examining compliance among CHF patients.

**Clinical Recommendations**

The discharge teaching for patients diagnosed with congestive heart failure should incorporate evidence-based practices that will reduce the risk of readmission to the hospital. The results from this study indicate that there is a disconnect between the information that is being delivered and what patients willingly incorporate into their lives. Future research should be conducted to determine if the problem rests in information delivery, or lack of client motivation. Furthermore, it is recommended that healthcare staff assess the learning style of the patient before delivering discharge instruction. It is believed that delivering instructional materials in alternative manners could improve retention and implementation of recommended practices.

Future recommendations also include more in-depth follow up of patients after discharge to determine their level of compliance with clinical recommendations. Earlier detection of non-compliance could lower rates of readmission for some patients. Nurses may play an active role in promoting patient compliance by providing continuity of care throughout and following discharge. This care should include explanation of discharge instructions, follow up assessment of compliance, and re-evaluation of plan of care after returning to a daily routine.

**Conclusion**

This study supports other published research on congestive heart failure regarding the importance of carrying out certain activities to reduce the risk of readmission. This study, as well as others, confirms that patient compliance is a monumental problem in reducing readmissions. Further research is needed in this area to determine the best plan

of action to alter the level of patient compliance. Furthermore, it needs to be a priority at all levels of healthcare delivery to assess levels of patient compliance and encourage adherence whenever possible.

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Appendix A

European Heart Failure Self-Care Behavior Scale (EHFScB-9)

Please answer the following questions regarding your self-care activities using a scale of

1 (I completely agree) through 5 (I completely disagree).

| Questions | I completely agree | I somewhat agree | I am undecided | I somewhat agree | I completely agree |
|---|---|---|---|---|---|
| I weigh myself every day. | 1 | 2 | 3 | 4 | 5 |
| If I get short of breath, I take it easy | 1 | 2 | 3 | 4 | 5 |
| If my shortness of breath increases, I contact my doctor or nurse | 1 | 2 | 3 | 4 | 5 |
| If my feet/legs become more swollen than usual, I contact my doctor or nurse. | 1 | 2 | 3 | 4 | 5 |
| If I gain 5 lbs. in 1 week, I contact my doctor or nurse. | 1 | 2 | 3 | 4 | 5 |
| I limit the amount of fluids I drink (not more than 8 cups/day). | 1 | 2 | 3 | 4 | 5 |
| I take a rest during the day. | 1 | 2 | 3 | 4 | 5 |
| If I experience increased fatigue, I contact my doctor or nurse. | 1 | 2 | 3 | 4 | 5 |
| I eat a low salt diet. | 1 | 2 | 3 | 4 | 5 |
| I take my medication as prescribed. | 1 | 2 | 3 | 4 | 5 |
| I get a flu shot every year. | 1 | 2 | 3 | 4 | 5 |
| I exercise regularly. | 1 | 2 | 3 | 4 | 5 |

Appendix B

Patient Survey

These questions are structured to determine what the patient's daily practices are. These

responses will be objectively compared to standard heart health recommendations such as

the "Heart Healthy Diet" guidelines and weekly exercise recommendations to determine

levels of compliance.

1.  Please explain your typical diet on an average day

2.  How many times per week would you say you miss a non-PRN medication?

3.  How many days per week do you engage in intentional physical activity that

    elevates your heart rate? (Ex. Walking, hiking, swimming…)

4.  On days that you exercise, how many minutes do you engage in physical activity?

5.  Have you had any episodes of worsening symptoms since your last

    hospitalization? If so, how much?

6.  Did your discharge teaching include instructions to weigh yourself daily?

7.  Have you had any episodes of worsening symptoms since your last

    hospitalization?

8.  What actions did you/would you take if you did experience worsening symptoms?

9.  On a scale from 0-10, 0 being "never," and 10 being "always," how often do you

    keep to your scheduled follow-up appointments?

10. On a scale from 0-10, 0 being "not at all," and 10 being "extremely compliant,"

    how compliant do you feed you have been overall with the health

    recommendations made to you by your provider?