

LOW SODIUM DIETS IN HEART FAILURE

Helping With Adherence to Low Sodium Diets for People with Heart Failure

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Abstract

There are almost 6.9 million people in the United States living with heart failure and about 800,000 of these people are hospitalized each year. Heart failure has an economic burden of \$43.6 billion. Heart failure is among the top 10 causes of hospitalizations and about 1 in 5 of patients are readmitted within 30 days of being discharged from the hospital. Hospitals are penalized when Medicare patients with the diagnosis of heart failure return to the hospital within 30 days of discharge. Following a low sodium diet is part of the treatment plan to manage heart failure. Problem: When patients with heart failure do not follow a low sodium diet, this causes fluid retention leading to shortness of breath, fatigue, and swelling of their legs. Research shows that there are many reasons that patients do not or are not able to follow a low sodium diet. Intervention: Using the Burden scale In Restricted Diets (BIRD) questionnaire on patients with heart failure can help their medical team understand their needs and individualize their treatment plan. The BIRD questionnaire was completed over two weeks in a hospital Cardiac Unit using a Likert scale to address the amount of burden they had following a low sodium diet to determine if a dietary consult is needed to decrease 30-day readmission rates. Results: Seven questionnaires were completed during this two-week period. There was a decrease in the percentage of patients readmitted the following month after the intervention from 9.5% to 3.4%. Conclusion: Further study should be conducted using more patients over a greater amount of time to have more evidence in the outcomes of the intervention.

Keywords: Heart failure, non-adherence, burden, low sodium diet, 30-day readmission

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Heart failure is a chronic disease with a very complex treatment regimen. Exacerbations can be very scary with symptoms of shortness of breath and fluid retention causing swelling to different parts of their body. Medications called diuretics can help decrease some of the extra fluid in the body by promoting several trips to the bathroom. One way to prevent some of the extra fluid is by following a low sodium diet. So, what is preventing patients with heart failure from doing this?

Overview

Problem Description

In the United States there are approximately 6.9 million people living with Heart Failure (Urbich et al. 2020). According to Horwitz and Krumholz (2021), there are about 800,000 patients with heart failure hospitalized every year. Urbich et al. (2020) report that the economic burden of heart failure in the United States is estimated to be \$43.6 billion, with over 70% of that number attributed to medical cost. The average cost of a heart failure specific hospitalization is \$13,418 per patient. The average cost for readmission within a 30-day period after a heart failure hospitalization range from \$15,732 to \$25,879 (Urbich et al. 2020).

At a local hospital, the Cardiac Unit admits an average of 20-30 patients each month with a primary diagnosis of heart failure. The goal for readmission rates is 15% or less for the Unit. In the last year there were some months where there were no readmissions but also a few where the readmission rate was 20%. Horwitz and Krumholz (2021) explain that part of the management of heart failure is following a low sodium diet. Chan (2018) reports some of the barriers to adherence of sodium restricted diets including lack of appropriate patient education, low sodium diets causing interference with social and family life, and the availability and affordability of

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healthier food alternatives. Determining factors that result in the patient with heart failure to not follow a low sodium diet may positively impact patient outcomes. The problem statement guiding this project was, “In hospitalized patients with the diagnosis of heart failure, does assessing and individualizing the patients’ needs to follow a sodium restricted/low sodium diet impact the 30-day readmission rates?”

The outcome for this project was a decrease in 30-day hospital readmission rates. The data regarding readmission rates will be monitored to see if the intervention helps to decrease this percentage. A questionnaire to determine the patients’ burden of following a low sodium diet was administered to better understand their needs to self-manage their heart failure with a low sodium diet at home.

Available Knowledge

Population

There are almost 7 million people in the United States who are expected to follow complex medical regimens to comply with their own self-care (Horwitz and Krumholz, 2021). These regimens include a minimum of three classes of medications that may be taken multiple times each day, following a restricted sodium diet, monitoring daily weights, the ability to identify early signs of deterioration, and being able to adjust their diuretics according to these changes (Horwitz & Krumholz, 2021; Audureau et al. 2018). The exact amount of sodium that patients with heart failure should consume is not known, but expert opinion recommends limiting sodium to less than 3 grams/day (Collins, 2018; Horwitz & Krumholz, 2021). Ryan et al. (2019) discusses a study that reports patients believe hospital admissions can be prevented by having more knowledge and adhering to a low sodium diet.

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According to a study by Seid et al, (2019), non-adherence was associated with gender, education level, other comorbidities, and knowledge about heart failure. Men were typically more compliant than women due to women being more prone to psychosocial distress and lower social support. Having other chronic comorbidities also applied to non-adherence especially considering the burden of polypharmacy issues. Knowledge about their condition increases their chances of adherence to self-care but it is also important to make sure that the heart failure patients' caregiver is involved and understands their treatment plan (Seid et al. 2019; Sullivan et al. 2016). Other burdens to self-care compliance include the interference of low sodium or sodium restricted diet on their social and family life, and the availability and affordability of healthier food alternatives (Chan, 2018), complicated grocery list, complicated meal preparation, difficulty managing a low sodium diet in their workplace, decreased appetite, or feeling like a burden to those preparing their meals (Audureau et al. 2018).

Intervention

Following a sodium restricted diet as part of the self-care and management of heart failure can be burdensome. Inquiring about some of these burdens from the patient can help healthcare providers address how to teach the patient important information about their care. Audureau et al, (2018) describe a tool that assesses the burden of dietary sodium restrictions in patients with heart failure. Many burden scales were implemented to come up with a new tool called the Burden scale In Restricted Diets or BIRD questionnaire (Audureau et al. 2018). Understanding specific burdens patients face in their self-care can help individualize management.

Ryan et al. (2019) explains the three Rs that help prevent heart failure readmissions, they include review, reassess, and reeducate. Patients require a lot of knowledge and skills to manage

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their heart failure. Reviewing the current treatment plan and their level of adherence with the patient can identify any clues to failure to the plan. Reassessing the plan should be done to address any of the patient's needs that should be met. Reeducating patients should be done throughout their hospital stay and not only at discharge including self-management and ways to prevent readmissions.

According to Sullivan et al, (2016) the family caregiver should also be included in the management and teaching of heart failure patients. The patient's caregiver is usually a spouse and is an important stakeholder in the patient's care. They are essential to the well-being of patients by providing care and assistance in managing their heart failure. Sullivan et al., (2016) report some concerns that the caregivers have were competence, compassion maintenance, and care of themselves. Competence concerns can be managed by including caregivers in important education being given to the patient along with addressing questions or concerns that they have. Compassion maintenance takes a lot of patience and the understanding that there are many complex needs for patients with heart failure. It is important to talk to the caregiver and assess their ability to care for their loved one and reassure them that it is ok to ask for help. The last concern is making sure that the caregivers are taking care of themselves. Identifying the needs of both the patient and the caregiver and educating them both throughout the hospital stay will help patients adhere to their sodium restricted diets and self-care (Sullivan et al. 2016).

Outcomes

When people with heart failure do not have their needs addressed in the hospital, the outcomes are poor. Symptoms of a heart failure exacerbation include shortness of breath, weight gain, fatigue, and swelling of their legs. Heart failure is among the top 10 causes of hospitalizations and about 1 in 5 of these patients are readmitted within 30 days of being

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discharged (Rau, 2020; Horwitz & Krumholz, 2021). The problem with readmissions according to Rau (2020) is that hospitals are penalized if Medicare patients with diagnoses of congestive heart failure return to the hospital within 30 days of discharge.

Rationale

The IOWA model (Iowa Model Collaborative, 2017) was utilized to guide the implementation of this project. The IOWA model uses different levels of evidence from research that was designed to provide guidance for nurses and other clinicians to make decisions about day-to-day practices affecting patient outcomes.

Identify Triggering Issues/Opportunities

Heart failure is a chronic condition with a complex medical regimen needed to prevent exacerbations (Horwitz & Krumholz, 2021). Managing heart failure takes a lot of self-discipline to keep up with medications that sometimes need to be taken several times a day and altered depending on symptoms they may be having. It also involves following a low salt or sodium restricted diet to prevent excess fluid from building up in their body. Identifying the needs of a person with heart failure to help them with their dietary needs and promote an acceptable quality of life brings an opportunity for healthcare professionals to use evidence-based care to help our patients.

State the Question or Purpose

In hospitalized patients with the diagnosis of heart failure, does assessing and individualizing the patients' needs to follow a sodium restricted/low sodium diet impact patients' outcomes and 30-day readmission rates?

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Is This Topic a Priority?

Heart failure and readmission rates on the Cardiac Unit is always a top priority. Hospitals are penalized when Medicare patients that have heart failure are readmitted within 30 days. Our goal is to keep this rate lower than 15%, but some months the number is closer to 20% for readmission rates.

Form a Team

The team that will be in place for this program is the staff of the Cardiac Unit. This includes the nurses, Nurse Practitioner, Clinical Nurse Specialist, Dietician, Care Manager, and Social Worker.

Assemble, Appraise, and Synthesize Body of Evidence

A comprehensive literature search was done using the terms heart failure, low sodium diet, adherence, costs, and burden. Articles were found from CINAHL, Pub Med, and Up to Date.

Is There Sufficient Evidence

There is evidence showing that there are multiple reasons in which people with heart failure do not or are not able to follow a low sodium diet. Individualizing care by finding out their needs can help better manage their condition. Some reasons that were discovered for not following a low sodium diet include the patient not knowing what they are supposed to be eating, the burden of a low sodium diet interfering with their social and family life, and healthier food not being available or accessible. All these reasons need to be approached differently.

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Design and Pilot the Practice Change

Working with a clinical partner on the Cardiac Unit provided a design to be implemented that will gather information about the patients' needs and help provide ways to better manage their heart failure.

This intervention was developed with the assumptions that there is more than one reason that people are not following a low sodium diet. When we only assume that they need to know what they cannot eat, then we are dismissing other burdens that could be involved in following a sodium restriction. Implementing this intervention worked to find more information about why following a low sodium diet can be so burdening and manage our time better on educating or finding resources to help the patient to manage their heart failure through a low sodium diet better.

Purpose

The purpose of this project was to determine if assessing the patients' individual needs with a dietary consult regarding adherence to a low sodium diet impacts 30-day readmission rates.

Methods

Context

This capstone project took place in a hospital in the Midwest. The non-profit hospital has 423 patient beds and admits approximately 22,000 patients every year. Besides Cardiac Care, there are other specialties such as Acute Rehabilitation, Cancer Care, Emergency Services, Geriatrics and Senior Services, Vascular, Lung and Pulmonary Medicine, Neurology, Neurosurgery and Spine, Weight Management, Occupational/Physical Therapy, Palliative Care, Sexual Assault and Domestic Violence, Surgery, and Wound Care. The project hospital site was

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the first hospital in the area to receive Magnet Status. There are three other hospitals that are part of the system within the area. The hospital is in a city with about 480,000 people. The city is composed of 77.47% Caucasian people, 12.32% Black or African American, 3.84% Asian, and 3.4% or less of other races (World Population Review, 2021). According to data from the Midwest hospital's Cardiac Unit, there are 20-30 patients per month admitted with a primary diagnosis of heart failure. Their goal is to keep readmission of patients within 30 days below 15%. Most of the time their numbers are below 15%, but some months are up to 20%. The Cardiac Unit is a 46-bed unit in a 423-bed hospital. On the Cardiac Unit there are 84 Registered Nurses, 28 Certified Nurses' Assistants, 2 Secretaries, and 3 Clinical Nurse Specialists. Most of the patients on the Cardiac Unit are Caucasian.

Intervention(s)

On average there are 20-30 patients admitted each month with an admitting diagnosis of heart failure. This questionnaire assesses the amount of burden that patients have when trying to follow a low sodium diet. The questionnaire uses a Likert Scale to address 14 questions that assess the patient's physical, mental, and social health status when following a low sodium diet. The paper questionnaire was given to heart failure patients upon admission to the Cardiac Unit by the nurse admitting the patient to the Cardiac Unit. The patient then circled their responses. The nurse looked at their responses and determined if a dietician should be consulted for the patient based upon their score. When a patient circled 'quite a lot' or 'very much' on any one of the questions 3, 4, 5, 6, 8, 9, or 12 of the BIRD questionnaire, the nurse asked the provider for a dietary consult. If the nurse requested a dietary consult, they marked a check mark that it was done on the questionnaire and placed it in an envelope that was kept at the charge nurse's station. This intervention was conducted from March 1, 2022, through March 15, 2022.

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The questions address the burden that consuming a low sodium diet has on their quality of their life. The questionnaire addresses how complicated the shopping and/or meal preparation is, how affordable the food is, the impact that following a low sodium diet has on relationships with family and friends, and the way sodium restriction makes them feel physically.

The people involved in helping with this intervention include the nurses, charge nurses, care managers, Dieticians, and Clinical Nurse Specialist. The Clinical Nurse Specialist provided guidance in the intervention to ensure that it addressed the concerns and needs of our heart failure patients. The care manager was available to connect patients with resources that may be needed to manage their low sodium diet. The dietician helps patients find alternatives to their favorite foods and/or give them ideas about following a low sodium diet without feeling like they are missing out on their family and social relationships. In addition to the questionnaire given to the patients, prior to implementation all staff nurses and dieticians received education about the questionnaire and the appropriate interventions based upon how the patient scores.

Study of the Intervention(s)

Study of the intervention was done by collecting the questionnaire responses from each patient admitted with heart failure. The data from each question and their response using the Likert scale was entered into an Excel spreadsheet. Demographic statistics were utilized to analyze each question. The data was displayed as a bar graph to visually represent which questions were answered as higher burdens.

The questionnaire included demographic information such as age, gender, and race. Age, gender, and race were evaluated to see if there are any correlations with 30-day readmission rates. There was not any identifying information on the surveys to maintain confidentiality. The information was reviewed to see if there was a need for a dietary consult and if one was ordered.

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This determined if the intervention of ordering a dietary consult based on the assessment tool was improving patient outcomes. It also determined if there was a relationship between some of the burdens and age, gender, or race. The 30-day readmission rate the prior month was compared to the data of readmission rates during the intervention and readmission rates the following month after the intervention was complete.

Measures

This BIRD questionnaire reported by Audureau et al. (2018) was utilized because it addresses many of the reasons that a person may not follow a low sodium diet and allows interventions to be individualized to improve patient outcomes.

The BIRD questionnaire has minimal published data. Permission was not needed to use the questionnaire, only credit to the publishers by being referenced in the paper. Although specificity and sensitivity measures were not reported, it was shown to be a valid and reliable tool on the 96 people who completed the questionnaire (Audureau et al. 2018).

The BIRD questionnaire addresses 14 items with an option to circle their desired answer on a Likert scale. The Likert scale point system includes Not at all = 0, Just a Little = 1, Somewhat = 2, Quite a Lot = 3, and Very Much = 4, with the option to circle Not Applicable if appropriate. In addition, patients who answered 'Quite a Lot' or 'Very Much' were requested to have a dietary consult. The questions that triggered the need for a dietary consult are questions 3, 4, 5, 6, 8, 9, or 12. There was also a section on the tool with demographic information that identifies gender, race, and age to determine if these were factors that play a role in burden and treatment. The cardiovascular clinical resource nurse on the unit gets a report with the percentage of readmissions for each month. The goal for the unit is to keep this number under 15%. The

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percentage of readmissions during the intervention was compared to the previous months to determine the outcome of the intervention.

Analysis

The method intended used to analyze the data was a one-way ANOVA to explain if there was an effect on 30-day readmission rates when using the BIRD questionnaire to determine if a dietary consult was appropriate. Due to the limited data gathered from the project this was unable to be conducted. The data analyzed and the demographic data of gender, race, and age is explained by descriptive statistics. With the help of the quality improvement department at the hospital, the data was able to be obtained and focus only given to the patients that were admitted to the Cardiac Unit. The intervention month of March was compared to the data from readmission rates for February being the pre-intervention month and April as the post-intervention month.

Excel was used to make a bar graph. Two bar graphs were made. One bar graph displayed raw data on the number of participants that answered each question. The other bar graph used raw data to determine which questions people were answering 'Quite a lot' or 'Very much.' The quality improvement information determined there were 11 patients admitted to the Cardiac Unit from March 1, 2022, to March 15, 2022.

Ethical Considerations

The aim of this quality improvement project was to decrease 30-day readmissions and improve outcomes in the care of the patient with heart failure. The questionnaire does not have the patient's name on it or date that they were at the hospital, only their age, gender, and race to determine if these are contributing factors to the need for dietary consultations. The project coordinator did not need to gather consent from the participants as this is a quality improvement

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project and is being implemented as the standard of care. The data was stored at the charge nurse station in an envelope during the time of implementation of the project. This station is not accessible to patients. The information was collected and entered to a password protected private computer on an Excel spreadsheet. Letters of acceptance were granted by management and a clinical leader. Before starting this intervention, an application was placed to the Institutional Review Board and not started until given the final approval. Collaborative Institutional Training Initiative (CITI) training was completed by the project coordinator and the faculty member overseeing the project. As the project coordinator and employee on the Cardiac Unit, I did not receive any benefits for this project.

Results

The seven questionnaires collected determined that there were six white patients and one unknown. There were five females, one male, and one unknown. The mean age of the six known ages was 81. Out of the seven questionnaires there was one participant that did not fill out the information on demographics and only one dietary consult ordered although from the answers on the questionnaire there should have been two.

From the questionnaire, high burden problems when following a low sodium diet includes decreased appetite, feeling like every meal is difficult, complications with grocery shopping, feeling like a bothersome to others preparing their meals, preventing them from traveling or going on vacation, it depresses them, and it aggravates their health.

Out of the seven patients that participated, none were readmitted within 30 days. Overall readmission rates were also collected and analyzed. February, the month prior to the intervention, there were 30 patients admitted to the Cardiac Unit with a diagnosis of heart failure. During this time there were five 30-day readmissions resulting in a 30-day readmission rate of

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about 16.6%. The month of March, during the intervention, there were 21 patients admitted with a diagnosis of heart failure. During this time there were two 30-day readmissions resulting in a 30-day readmission rate of about 9.5%. April was the month following the intervention. There were 29 patients admitted with heart failure, with only one 30-day readmission, resulting in a readmission rate of about 3.4%. Two of the seven participants should have had a dietary consult ordered, but only one was ordered. With the small size of the participants, it is hard to determine if having a dietary consult would be beneficial to patients with heart failure, but, if only looking at this study it does not appear that it would be beneficial to the patients.

Discussion

Summary

With the limited data retrieved during this project, it is unknown what specific effect the BIRD questionnaire may have had on 30-day readmission rates. Analysis of the data did reveal some of the more burdensome questions from the project. Some of the bigger burdens that were revealed from the participants questionnaire responses included decreased appetites, grocery shopping complications, feeling like they are bothering those preparing their meals, preventing travel or vacationing, the low sodium diet depressing them, and aggravating their health. This questionnaire is still a useful tool in helping to understand that there are multiple reasons that a person may not be compliant with a low sodium diet. When patient care and treatment is individualized to the person's needs, it may promote better outcomes.

Interpretation

Seid et al, (2019) reported that men are typically more compliant than women due to women being more prone to psychosocial distress and lower social support. In the collected data there were five females, one male, and one unknown.

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Chan (2018) reported that adhering to a low sodium diet interfered with social and family life. One of the more burdensome questions on the questionnaire reported that they felt that following a low sodium diet prevented them from traveling or vacationing. Data from the project revealed burdens of grocery shopping complications, feeling like they are bothering those preparing their meals, and decreased appetites. These were similar to the burdens identified in the study from Audureau et al (2018).

The impact of this project helps with the understanding that lack of education on what people should be eating or no adherence to following a low sodium diet are not the only reasons that people are unable to manage their heart failure with a sodium restricted diet. As described in the questionnaire, some of the other reasons include decreased appetites, grocery shopping complications, feeling like they are bothering those preparing their meals, preventing travel or vacationing, the low sodium diet depressing them, and aggravating their health.

Limitations

Due to the burden of the COVID-19 pandemic, this project could only be implemented over a two-week period rather than the 30 days that was intended. With the high patient volumes, heart failure patients that needed to be admitted were not always admitted to the cardiac unit due to bed availability preventing these patients from participating in the BIRD questionnaire. When talking with staff about patients that were admitted but did not participate, it was determined that some of these patients were unable to participate because of dementia or refusal to participate.

Another limitation to this project is that while the seven patients that participated were not readmitted within 30 days, it was too small of a group to gather substantial data for analysis. did not share demographic information including age, race, or gender. One of the participants should have had a dietary consult that was not marked as done making it unknown if having this

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consult could have been beneficial to this patient. With limited data collected, a one-way ANOVA was unable to be done to determine if a dietary consult had any effect on 30-day readmission rates. Instead of using a one-way ANOVA, descriptive statistics were used to determine if some of the questions in the BIRD questionnaire were more burdensome than others. By entering data using points for each question per the Likert scale, results were noted at which questions had the highest burdens. Race was also a limitation since the project was implemented in a mostly Caucasian community composed of 77.5% Caucasian people. There was one unknown participant, but all the others were Caucasian. It is unknown if the participants in a more diverse population would have answered differently.

Conclusions

The revised standards for quality improvement reporting excellence (SQUIRE 2.0) were used as a framework for reporting this project. The research done to determine reasons for non-adherence to a low sodium diet determined that not knowing what to eat or choosing not to follow the recommended diet were not the only reasons that people do not follow a low sodium diet. By providing patients with the 14 item BIRD questionnaire, it can help individualize the treatment plan for patients with heart failure. This questionnaire can be useful in hospitals or clinic settings when making treatment plans for patients with heart failure. It can save time by understanding what the individual's particular burdens are when following a low sodium diet. Individualizing the treatment plan can mean giving the patient more education on their condition or helping them find resources that will benefit them. Further studies could be done by using this questionnaire on all patients admitted to the hospital with heart failure. 30-day readmission rates could be compared after the implementation of the BIRD questionnaire in hospitals that make it part of their admission process.

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