



Preventing Hospital Readmissions for Heart Failure Through Dietitian Follow-up Nutrition Education

Introduction

Heart failure, or HF, occurs when the heart muscle becomes weak and unable to pump enough blood and oxygen throughout the body.¹ This results in fatigue, shortness of breath, fluid accumulation, lack of appetite or nausea, malnutrition, and even death.² HF is a chronic and progressive health issue for which there is no cure.¹ It is the fastest growing cardiovascular condition worldwide and imposes significant clinical and economic challenges to health systems.³ Approximately six million Americans over 20 years of age have HF. The prevalence of HF is projected to increase by 46% by 2030, affecting more than eight million adults in the United States.⁴

It is estimated that one-third of Americans have at least one risk factor for HF: coronary heart disease, high blood pressure, obesity, diabetes or smoking. Other risk factors are male gender, older age and ethnicity (African Americans have higher rates of HF than other racial groups).⁴ Patients with HF often have poor outcomes when faced with medical complications. According to a large recent study, 24.2% of HF patients admitted with COVID-19 died in the hospital compared with 2.6% of patients admitted with acute HF alone.⁴

Nearly 1 in 4 HF patients are readmitted within 30 days of discharge and approximately half are readmitted within six months.^{5,6} Studies indicate about one quarter of HF readmissions may be preventable. Over the past decade, researchers and policymakers have made significant efforts to decrease readmissions and avoid excessive healthcare spending. In 2009, the Centers for Medicare and Medicaid Services started public reporting of hospital-level 30-day risk adjusted readmission rates for HF. In 2010, Congress added a financial incentive to decrease readmission beyond 30 days, as readmissions rates remain as high as 30% within 60 and 90 days after discharge.⁶

Nutrition intervention is an important component of HF management. The initial goal of nutrition therapy is to manage symptoms of fluid retention, shortness of breath, and fatigue. An overall goal is to reduce the workload of the heart, providing for longer and better quality of life.⁷ These goals are achieved with adequate calories and nutrients and modifications of sodium and fluid.⁷ The Registered Dietitian Nutritionist, or RDN, is a health professional uniquely qualified to provide nutritional guidance and support during hospitalization and after discharge.

A combination of physical and socioemotional factors influences the ability of the patient to manage heart failure.⁸ Overwhelming medical instructions cause confusion and uncertainty in following recommendations, producing feelings of hopelessness and frustration. A cycle of despair begins, characterized by worsening adherence, negative emotions, and an increase in distressing symptoms. Under these upsetting conditions, the hospital may be viewed as the safest place for care and recovery.⁸

Although diet modification is recognized as a vital aspect of HF treatment, compliance can be low unless the patient clearly understands what and how they should eat.⁹ Predictors of success in following a sodium-restricted diet include knowledge/skills, outcome expectations, inclusion of cultural norms, social support, taste, food access, self-efficacy, self-regulation, habits, and mental health.¹⁰ This study described here investigates the impact of post-discharge phone calls by RDNs on patient HF management at home and the avoidance of hospital readmission.

Project Description/Objectives

Heart failure patients are visited by numerous healthcare professionals, all with information the patient must remember after discharge. These include follow-up appointments, new medications and their interactions, physical/occupational therapy recommendations, and daily fluid assessments. The multiple instructions can make it difficult for patients to also remember their prescribed diet guidelines. Follow-up calls help the RDN identify knowledge gaps and reinforce key concepts. The calls also provide the opportunity to assess home resources (food availability, access to a scale, etc.) and other personal barriers they may not have thought to discuss while in the hospital. The impact of HF on their physical stamina could also compromise self-care, such as decreased appetite and inability to prepare meals. With attentive probing, RDNs can recognize these challenges.

Methods

A total of 30 patients were divided into two groups of 15. All patients were educated on a low-sodium diet by an RDN during their hospital stay. The intervention group received additional education through follow-up calls, at one week and two weeks after discharge (see Table 2). The control group did not receive a follow-up call. Topics covered during the initial education in the hospital were readdressed with the intervention group and included teach back in the follow-up calls. If a patient was unable to show comprehension, the RDN conducted a re-education on that topic during the call. Additional topics/concerns brought up by patients during follow-up calls were noted for future use in education material (see Table 3).

Study participants were captured by the RDN using physician consult, nursing admission screening notifications or by the admission primary diagnosis (CHF/heart failure/congestive heart failure). Exclusion criteria were patients over the age of 85, unalert or disoriented, food insecure, left against

medical advice, discharged to nursing facility, or with additional medical complications where oral intake was strongly encouraged (e.g., cancer, malnutrition). These patients may still have been educated by the RDN based on their individual needs but were not included in the study.

Objectives

1. *Reduce 30-day heart failure readmissions for patients with heart failure.*
2. *Reinforce diet education after discharge for patients with heart failure.*

Study Scope

Characteristics that were included or excluded in the development of the project.

Included	Excluded
Low-sodium diet education	Cost of care
Data collection	Length of stay
Screening for education needs (language, reading abilities, hearing challenges, etc.)	Patients requiring additional diet education outside of low sodium
	Food insecurity

Assumptions:

- RDN will capture heart failure patients through nutrition screening process (diagnosis, nursing screening assessment, physician consult).
- Education will focus on low-sodium diet education only.
- RDN will use Sodexo-approved low-sodium diet education materials.
- Follow-up calls will occur at one-week and two-week increments.

Risks:

- Patients unavailable to call back.
- COVID-19 pandemic interfering with admissions/readmissions.

Results

Two patients were readmitted in the intervention group. One was admitted with COVID-19 while the other was admitted with a gastrointestinal bleed. Neither had active heart failure issues documented in their electronic medical record. Six patients were readmitted in the control group. One was admitted with COVID-19, one was admitted with constipation and four were admitted for heart failure exacerbation.

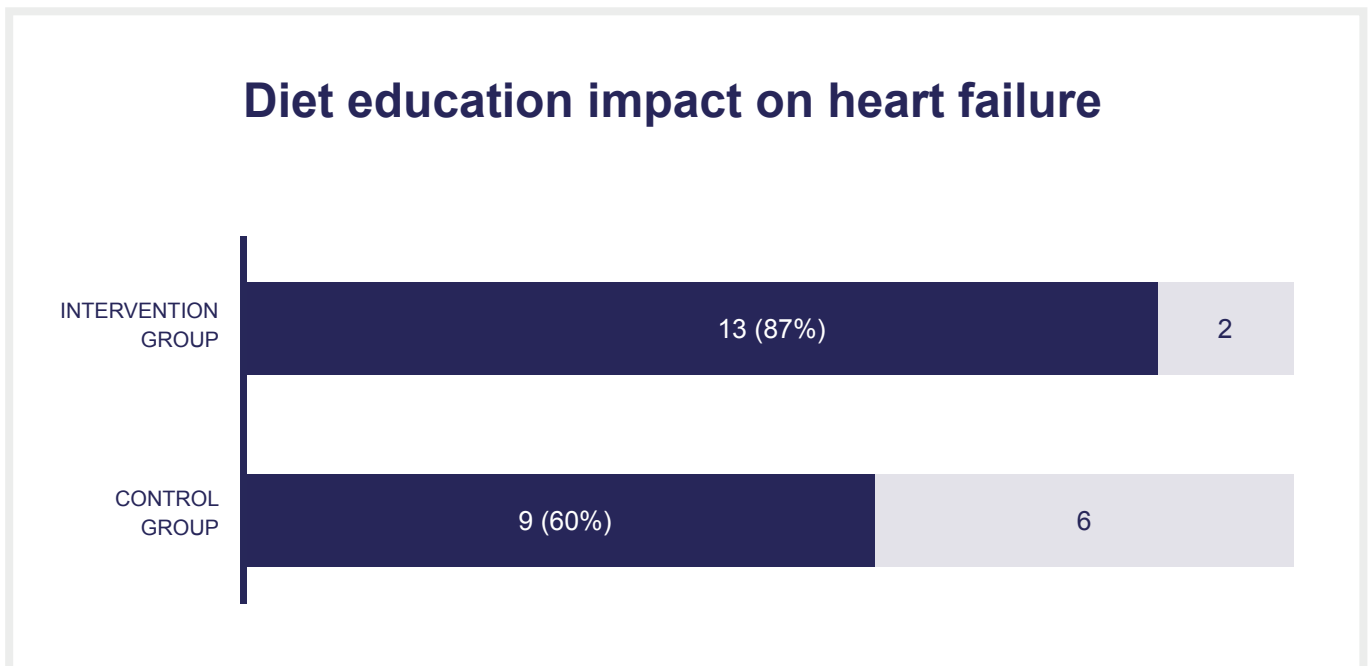
Eighty-seven percent of HF patients who received follow-up calls by an RDN were able to avoid readmission to the hospital within 30 days, as opposed to 60% who only received diet instruction during their hospitalization. Of the 13 patients in the intervention group who were not readmitted to the hospital within 30 days, nine were able

to correctly verbalize understanding of the six learning points after the first call and an additional two (11 total) by the second call.

Even though they understood the instructions, two patients struggled with compliance. One patient admitted to adding salt to food and not reading food labels. However, this patient had been diagnosed with COVID-19, could only taste salty foods, and had a significant weight loss due to loss of appetite.

The other patient reported the continued addition of salt to bland food items (eggs/pasta/tomatoes). Follow-up education by the RDN was provided to each of these patients.

Table 1. 30-day Readmission Rates for both the Intervention and Control Groups



- Number of patients discharged without readmission
- Number of readmissions

Table 2. Number of Patients who Understood Questions Asked During Follow-up Calls

Learning Points	Number answering correctly	
	Week 1	Week 2
How much sodium are you allowed in a day?	9	13
How often do you cook with salt?	8	11
How often do you read food labels for sodium content?	11	12
Can you identify three high-sodium foods?	12	13
When you order takeout or eat at a family member/friend's, how do you accommodate these changes?	11	13
Do you have a scale at home/how frequently do you weigh yourself?	12	13

*Two patients were readmitted between the first and second follow-up calls, making 13 the highest possible number of participants answering correctly.

Outside of these learning points, patients also looked to discuss other low-sodium diet topics. Some of the areas that patients lacked understanding included:

Use of various salts (Himalayan, Kosher, sea, and iodized salt), salt substitutes, and salt-free seasoning blends. Four patients were under the impression that either Himalayan salt or sea salt was “healthier,” which offered the opportunity to intervene and clarify that all salts contain sodium.

Sodium contents. Three patients had questions about the sodium content of specific foods, which allowed further review with patients regarding sodium on a food label and how to evaluate whether that food is “high” or “low” in sodium.

Meal preparation. Two patients realized they struggled with preparing meals or obtaining groceries at home. The RDNs were then able to provide information on various meal delivery services.

Recipes. Another two patients had questions regarding low-sodium recipes and accessible resources; recommended cookbooks and approved websites were identified.

Sodium prescription. Two different patients required clarification of their sodium prescription, thinking the limit on their sodium intake was less than 1000 mg/day (individual recommendations range from 1500 mg to 3000 mg/day).

Education reinforcement. Finally, two patients did not recall any education while in the hospital. This was a chance to re-educate and provide another follow-up call to ensure that they were able to retain the information.

Table 3. Patient Topics/Questions During Follow-up Calls

Subjects discussed	Number of patients discussing topics
Salts/salt substitutes/seasoning blend	7
Sodium content of specific foods	3
Meal delivery services	2
Low-sodium recipes	2
Sodium limit clarification	2
Complete re-education	2

Discussion

Patients typically responded positively to the follow-up calls and were given a chance to ask questions that came to mind once they got home. Patients were able to apply the information to their lifestyle, enabling them to take control of their health.

Two patients seemed to benefit the most from follow-up calls. Both patients were under the age of 50 with new heart failure. One was a truck driver who ate takeout for most meals while the other had been trying to lose weight through the “keto” diet. The follow-up calls served to ensure comprehension of diet and execution of healthy and sustainable lifestyle changes. Both patients expressed concern regarding other challenges at home that they didn’t discuss while in the hospital. They benefited from having follow-up calls, evidenced by verbalization of appropriate diet interventions. Additionally, lessons were learned

about topics to include in future education during the inpatient stay and follow up calls.

There were some challenges presented during the study. First, many patients also had follow-up calls with physicians, nurses, or physical therapists in the two weeks post-discharge. Some patients required multiple attempts to reach them each week due to the number of healthcare personnel trying to contact them at home. Also, patients who had heart failure and were diagnosed with COVID-19 often found it difficult to maintain their diet recommendations. As weight loss is common with COVID-19 patients, some unintentionally lost weight due to nausea, lack of appetite, and changes in taste. Changes in taste led to an increased salt intake as these patients found that food was unappealing, and salt was the only flavor they could detect.

Conclusion



Post-discharge nutrition follow-up calls by an RDN were an effective method to prevent readmissions for heart failure patients. Patients with new heart failure showed the most benefit from these calls. Most of the patients were able to verbalize understanding of the key learning points by the second call.

New heart failure patients required more time during their phone calls and needed clarification regarding sodium limits. They were, however, able to express their understanding of the diet modifications by the second follow-up call.

References

1. What is Heart Failure? American Heart Association website. Reviewed May 31, 2017. Accessed December 20, 2022. <https://www.heart.org/en/health-topics/heart-failure/what-is-heart-failure>
2. Cardiovascular Disease. Heart Failure. Academy of Nutrition and Dietetics Nutrition Care Manual. 2022. Accessed December 20, 2022. https://www.nutritioncaremanual.org/topic.cfm?ncm_category_id=1&lv1=272984&lv2=8585&ncm_toc_id=8585&ncm_heading=Nutrition%20Care
3. Lawson C, Crothers H, Remsing S, et al. Trends in 30-day readmissions following hospitalisation for heart failure by sex, socioeconomic status and ethnicity. *EClinicalMedicine*. 2021 Jul 14;38:101008. doi: 10.1016/j.eclinm.2021.101008
4. Tsao CW, Aday AW, Almarzooq ZI, et al. Heart Disease and Stroke Statistics-2022 Update: A Report From the American Heart Association. *Circulation*. 2022 Feb 22;145(8):e153-e639. doi: 10.1161/CIR.0000000000001052. Erratum in: *Circulation*. 2022 Sep 6;146(10):e141
5. Centers for Medicare and Medicaid Services (CMS). Medicare Hospital Quality Chartbook. National Rates Over Time: Heart Failure. Accessed December 12, 2022. <https://www.cmshospitalchartbook.com/visualization/national-rates-over-time>
6. Khan MS, Sreenivasan J, Lateef N, et al. Trends in 30- and 90-Day Readmission Rates for Heart Failure. *Circ Heart Fail*. 2021 Apr;14(4):e008335. doi: 10.1161/CIRCHEARTFAILURE.121.008335
7. Cardiovascular Disease. Heart Failure. Nutrition Interventions. Academy of Nutrition and Dietetics Nutrition Care Manual. 2022. Accessed December 20, 2022. https://www.nutritioncaremanual.org/topic.cfm?ncm_category_id=1&lv1=272984&lv2=8585&lv3=272420&ncm_toc_id=272420&ncm_heading=Nutrition%20Care
8. Sevilla-Cazes J, Ahmad FS, Bowles KH, et al. Heart Failure Home Management Challenges and Reasons for Readmission: A Qualitative Study to Understand the Patient's Perspective. *J Gen Intern Med*. 2018 Oct;33(10):1700-1707. doi: 10.1007/s11606-018-4542-3
9. Damy T, Benedyga V, Pezel T, et al. Prescription, Compliance, and Burden Associated with Salt-Restricted Diets in Heart Failure Patients: Results from the French National OFICSel Observatory. *Nutrients*. 2022 Jan 12;14(2):308. doi: 10.3390/nu14020308
10. Burgermaster M, Rudel R, Seres D. Dietary Sodium Restriction for Heart Failure: A Systematic Review of Intervention Outcomes and Behavioral Determinants. *Am J Med*. 2020 Dec;133(12):1391-1402. doi: 10.1016/j.amjmed.2020.06.018