

Using Atlanta Heart Failure Questionnaire in ambulatory heart failure patients with preserved ejection fraction HFPEF

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journals.sagepub.com/home/cvd**Kamal W Alghalayini**

Abstract

Objectives: The present study uses the Atlanta Heart Failure Questionnaire as a tool to evaluate and design a tailored education material for ambulatory heart failure patients with preserved ejection fraction, highlighting the strengths and weakness toward the planning of education programs.

Methods: A total of 450 patients were screened; 112 patients were recruited, and 27-item was used to evaluate the usefulness of this questionnaire. All patients received education by a dedicated medical education about the nature of the disease, risk factors and management including prevention of complications. Descriptive statistics were used for assessing the sample characteristics.

Results: In the assessment of patient disease knowledge, in a 7-item questionnaire, the most well-understood item was correctly identified in 95% patients, whereas the least-understood item was identified in 1.8% of patients. In the assessment of patient management knowledge, in a 6-item questionnaire, the most well-understood item was correctly identified in 50% of patients and the least-understood item was identified in 10% of patients. In the assessment of patient medication intake knowledge, in a 3-item questionnaire, the most well-understood item was correctly identified in 97.3% of patients and the least-understood item was identified in 26.6% of patients.

Conclusion: For a disease not fully understood, the study has concluded the usefulness of Atlanta Heart Failure Questionnaire for filling the gaps, setting a base line and follow-up in the process of educating ambulatory heart failure patients with preserved ejection fraction HFPEF.

Keywords

Atlanta Heart Failure Questionnaire, patient education, heart failure, HFpEF

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Introduction

Heart failure (HF) is a disease that mostly develops due to chronic risk factors such as diabetes mellitus, hypertension, and ischemic heart disease. Controlling such risks factors delay and may even prevent the development of heart failure. Unfortunately, all risk factors are asymptomatic in its early stages and require knowledge, medical follow-up, and commitment to deal with such condition not only to control the disease but also to prevent the development of the adverse complications.¹ Heart failure has emerged as a major health problem, which shows significant impact on economic situation, mortality, and quality of life of individuals. Lack of patient knowledge regarding heart failure results in social isolation, lack of self-care, co-morbidities, and worsening of quality of life.¹

There is a reduction in the severity of disease and heart failure-related symptoms by adhering to current heart failure guidelines for improving the prognosis related to mortality and re-hospitalizations.² Three types of heart failure are listed in the European Society of Cardiology guidelines:²

1. Heart failure with reduced ejection fraction of less than 40%.

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2. Heart failure with medium range ejection fraction of 40%–49%.
3. Heart failure with preserved ejection fraction of 50% or more.

Improved outcomes for hypertensive and diabetic patients can be attained with education concerning their disease and lifestyle modifications.³ The very first heart failure knowledge instrument was a 3-part tool that was administered by home health nurses assessing learning style, family and environment, and current knowledge.⁴ This mainly focused on the level of awareness among heart failure patients regarding the process, activity, medications, and diet.⁴ Expert review is likely to be used for the establishment of content and face validity. This tool is to be used positively for determining comprehensive and focused teaching to the patients with heart failure.

Another study conducted by Artinian et al.⁵ was successful in developing a 13-item multiple choice test questionnaire that also included additional items requiring short answers. The items included in this questionnaire were based on clinical experience and validity analysis because this type of questionnaire was performed by a nurse practitioner. Similarly, another study was based on a 15-item multiple choice test, known as the Dutch Heart Failure Knowledge Scale that assessed heart failure patients that had to be hospitalized.⁶

The two most common causes for hospital readmissions of patients with HF are the failure to keep to a medications regimen and low adherence to a low-sodium diet. Thereby, it is essential to accurately evaluate the diet of a patient, which is important for the control of HF. In addition, sociocultural values of patients should be evaluated that helps to make adequate food selection when making a diet plan. In general, the education and knowledge of HF in patients and their families are an important factor in disease management. Thus, medical personnel play a vital role in educating patients about their disease process autonomously.

The successful management of HF patients relies on controlling signs and symptoms, which include drug regimens, exercise plans, daily weights, and diet control of salt intake. The achievement of treatment plans is important for improving outcome and quality of life. The present study aims to use the Atlanta Heart Failure Questionnaire as a tool to evaluate and design a tailored education material for patients with heart failure and preserved ejection. This is the first time that such a questionnaire is tested in such a cohort of patients that showed usefulness in setting a base line for the level of knowledge that patients at risk for heart failure possessed. It may be an important tool

in designing patient educational programs and utilizing the questions as a key performance indicator KPI for follow-up in the collaborating effort and preventing heart disease. The results are likely to depict the usefulness of the Atlanta Heart Failure Questionnaire for setting a base line and follow-up in the process of educating ambulatory heart failure patients with preserved ejection fraction. Moreover, it is also of importance in developing patient education material in heart failure programs for treatment and prevention.

Theoretical background

The prevalence of heart failure increases with age, and requires management, especially in ischaemic cardiomyopathies. The patient's adherence to treatment can be improved through non-pharmacological management that include, self-care management, self-care behaviour, and patient education.⁷ The higher cost of heart failure is associated with higher rates of hospitalization.⁸ Severe physical symptoms are experienced by the majority of heart failure patients which visit emergency departments and are admitted.⁹ Therefore, it is obvious that the negative impact on the health of these patients can be prevented first, and once the diagnosis of heart failure is established, then the prognosis can be improved by assessing the physical symptoms through a reliable and valid instrument.

Studies have used various instruments to assess the physical symptoms among patients suffering from heart failure, such as the Heart Failure Somatic Perception Scale (HFSPS),¹⁰ MSAS-Short Form,¹¹ Memorial Symptom Assessment Scale (MSAS),¹² and Kansas City Cardiomyopathy Questionnaire (KCCQ).¹³ In the former and latter instruments, it is difficult to differentiate the physical symptoms from functional impairment. Therefore, an efficient scale is needed to measure the frequency, stability, and burden of the physical symptoms experienced by patients. The depressive and physical symptoms can be improved through different types of interventions that include: tele-health communication devices, comprehensive discharge programs, educational programs, and appropriate diet charts and exercises.¹⁴

Heart failure not only creates psychological and physiological burdens, it can also impose a severe economic burden on health insurance systems. A study conducted by Kato et al.¹⁵ showed significant reduction in hospitalization rates as a result of disease management programs that enhanced self-care among the patients. This is linked to an increase of knowledge regarding their own condition, although the improvement in hospitals was not specified. A few studies have shown better adherence is associated with greater knowledge, although knowledge regarding heart failure

does not always result in adherence to therapeutic regimens.^{6,16,17}

In this regard, a study by Sedlar et al.¹⁸ has identified personal and environmental factors that should be taken into consideration with self-care behaviours among HF patients, which include health-related quality of life, gender, education, and age. Another study has found that poor self-management capacity of HF patients is associated with gender, disease severity, number of comorbidities, age, ethnicity, low income, literacy, education, and baseline self-management capacity. Thereby, there is a need to put forth efforts for enduring unravelling success of self-management interventions and for validating the shifting influence of patient characteristics.¹⁹

Methods

Instruments

At the initial phase, Atlanta Heart Failure Knowledge Assessment Test was used for evaluating the knowledge of patients and their families regarding heart failure and its treatment (including self-care). For this purpose, a 27-item instrument was used that would help in measuring change in knowledge after being exposed to education and self-management intervention. The items of the questionnaire measure different factors of patient education that relate to the process of heart failure. These items are based on the concepts that are associated with clinical recommendations, mainly emphasizing on self-care. The items included in the study were arranged in the following way: pathophysiology (2 items), symptom management (4 items), behaviour (5 items), medication (5 items), and nutrition (11 items).

The test scoring attributed to 1 point for a correct answer; however, with this there was no additional weighting of the items. This is likely to be followed by gathering the correct responses. Against each item, there were more than two choices as this instrument was developed for discrete knowledge measurement. The questionnaire was revised based on the comments provided by the researchers. An official translation body translated the data collected from Arabic into English.

Study population

A total of 480 patients were screened from which the study has collected data from 112 heart failure ambulatory heart failure patients with preserved ejection fraction (HFpEF). The study has been approved by Institutional Review Board of King Abdulaziz

University, Saudi Arabia. Written consent was obtained from recruited patients.

Inclusion criteria

The eligibility criteria for this study were:

- Ability to read, write, and speak English.
- Telephone access.
- Diagnosis of heart failure with preserved ejection fraction.
- Symptoms of heart failure.
- Shortness of breath.
- Lower limb oedema.
- History of hospitalization for heart failure.
- Echo EF more than 50% with diastolic dysfunction.

Data collection

The patient medical records were used to gather patient demographic and clinical data at Internal Medicine Clinic, King Abdulaziz University Hospital, Saudi Arabia. The patients were told to complete the Atlanta Heart Failure Knowledge Assessment Test. Before completing the questionnaire, patients were asked to sign a consent form to ensure their participation in the study. The patients were requested to answer each question to the best of their abilities, but if they did not know an answer they were permitted to make an educated guess. The patient demographic and clinical data obtained from their history showed that the ratio of males to females was equal (Table 1). Regarding the risk factors, the majority of the patients stated that they were suffering from diabetes (65.2%), hypertension (69.9%), obesity (32.1%), and were not habitually smoking (95.5%); 52.7% of patients stated that they knew that any previous risk factor is responsible for causing HF, whereas 47.3% of the patients disagreed on this (Table 1). The last item “previous risk factor is responsible for causing HF” was assessed

Table 1. Demographic characteristics of the respondents.

Measure	Items	Frequency	Percentage
Gender	Male	56	50
	Female	56	50
Do you have any of the following risk factors			
Diabetes	No	39	34.8
	Yes	73	65.2
Hypertension	No	34	30.4
	Yes	78	69.6
Obesity	Yes	36	32.1
	No	76	67.9
Smoking	Yes	5	4.5
	No	107	95.5

as the one that can be used to develop educational interventions and to improve patients' knowledge.

Data analysis

Descriptive statistics were used for assessing the sample characteristics. Item statistics were also generated to describe discriminations and difficulties faced by patients. The data were analysed using Statistical Package of Social Sciences (SPSS) version 20.0. Means and standard deviations were used for descriptive statistics and Pearson correlation coefficient was used for inferential statistics, showing the association between patient education and questionnaire items.

Results

In Table 2, the first group of questions is about assessing patient education regarding management of HFpEF; six questions were used. The first indication question, "In the individual affected with HFpEF gained 3 kilograms in 3 days", 8.9% of the participants said "has water retention" which is the correct answer, whereas 48.2% chose "needs to exercise to burn off calories". In the question on how frequently an individual affected with HFpEF should measure his or her weight, 50.9% of the respondents said "weekly" as an answer for the second question, yet the correct answer is "daily", which was chosen by 22.3% of patients. In the question regarding the best time for weight measurement for a person affected with HF, only 64 (48%) answered correctly ("right after waking up"), while

33% answered "before going to bed". In a similar manner, the question, "Which of the following symptoms must an affected individual contact the physician?", 68.8% answered wrongly, with "swelling of ankle or stomach", whereas only 17.9% chose the correct answer "all of the above". When patients were asked about the frequency of the physical activity, the majority of the respondents (87.5%) chose the wrong answer "2–3 times per day". Only 0.9% answered correctly, with "daily". While 44.6% got the right answer with regard to the symptoms that prevent the physical activity, 42% chose "chest pain".

Table 3, on assessing patient education regarding heart failure with preserved ejection fraction reports on seven questions. The maximum score of all items was 95.5% and the minimum score was 1.8%. In the issues related to HFpEF question, the majority (95.5%) chose "increases the blood volume in the body". Only 3.6% chose the correct answer, which was "medications can be used to treat HFpEF", as compared to 57.1% patients that wrongly chose "individuals affected with HFpEF cannot have a normal life". Only 27.7% of patients in the questionnaire said that HF patients should avoid foods with high level of salts. Also, 16.1% said "no" to HFpEF patients drinking large amount of fluids, which is the correct answer. But 67.9% patients correctly said "yes" to HFpEF patients quitting smoking. Among study participants, only 1.8% said "no" to stopping the medications when HFpEF patients feel better. Only 22.3% thought that it is important to know the signs that require them to contact the physician.

Table 2. Assessing patient education regarding HF.

Measure	Items	Frequency	Percentage
The issue related to HF is	Increases the blood volume in the body	107	95.5
	Causes a decrease in the heart's ability to pump blood	5	4.5
	Causes a block in cardiac blood vessels	–	–
	Causes an irregular heartbeat	–	–
Which of the following statements regarding HF are true?	Medications can be used to treat HF	4	3.6
	Individuals affected with HF can't have a normal life	64	57.1
	There is no treatment for HF; however, complications can be avoided and controlled	26	23.2
	HF causes a complete stop in the heartbeat	18	16.1
Avoidance of high sodium (salt) food	Yes	31	27.7
	No	80	71.4
Drinking large amounts of fluids	Yes	94	83.9
	No	18	16.1
Quit smoking	Yes	76	67.9
	No	36	32.2
Stop taking HF medications when they feel better	Yes	110	98.2
	No	2	1.8
Know which signs that requires them to contact the physician	Yes	25	22.3
	No	87	77.7

Table 3. Assessing patient education regarding medication intake for HF.

Measure	Items	Frequency	Percentage
Common medications used for HF increase the heart capabilities to pump blood by	Removing excess fluids and sodium from the body	109	97.3
	Decreasing the size of blood vessels	2	1.8
	Decreasing pressure and daily stress	1	0.9
	Increasing the count of red blood cells (anaemia resistance)	–	–
Individuals affected with HF take a diuretic medication (Lasix) so that	The kidneys can generate urine	41	26.6
	The heart can have a regular heartbeat	10	8.9
	Blood vessels can be wider	47	42.0
	The heart can beat stronger	14	12.5
Individuals affected by HF who take a diuretic medication must	Know if they have to take potassium supplements	50	44.6
	Take the diuretic medication after 3:00–4:00 p.m.	20	17.9
	Not worry if dehydration signs started to appear	35	31.3
	Drink high volumes of water to compensate for fluid loss	7	6.3

Table 4. Assessing patient education regarding management of HF.

Measure	Items	Frequency	Percentage
Individual affected with HF gained 3 kg in 3 days indicate	Consumes high-calorie foods	33	29.5
	Has water retention	10	8.9
	Needs to drink more liquids	15	13.4
	Needs to exercise to burn off calories	54	48.2
How frequent should an individual affected with HF measure his/her weight?	Daily	25	22.3
	Weekly	57	50.9
	Monthly	10	8.9
Best time for weight measurement for a person affected with HF is	From time to time	20	17.9
	Before going to bed	37	33.0
	Right after waking up	3	47.3
	During lunchtime	11	9.9
Which of the following symptoms must an affected individual contact the physician?	When they remember to measure	11	9.9
	Gaining 3 kg in 3 days	13	11.6
	Swelling of ankle or stomach	77	68.8
	Breathing issues	2	1.8
How frequent should an affected individual perform physical activity?	All of the above	20	17.9
	Weekly	3	2.7
	Daily	1	0.9
	Frequent times daily	10	8.9
Affected individuals must stop physical exercise if which symptoms arise?	2–3 times per day	98	87.5
	Breathing issues	13	11.6
	Chest pain	47	42.0
	Dizziness	2	1.8
	All of the above	50	44.6

Table 4, the last group of questions assessed patients' education regarding medication intake for HFpEF. For the first question ("How do common medications used for HFpEF increase the heart capabilities to pump blood?"), most patients (97.3%) answered correctly by electing that they "remove excess fluids and sodium from the body", while only

26.6% correctly knew that diuretic medication helps the kidneys to generate urine in heart failure patients with preserved ejection fraction patient. Finally, only 44.6% chose the correct answer, which is to "know if they have to take potassium supplements", in response to the question, what an HFpEF patient on diuretic medication must do.

In the assessment of patient education regarding nutrition intake in the management of HF. Patients were asked about 11 items, the majority of patients scored true answers in seven items and wrong in four items as shown in Table 5. Three of the fault's answers are discussing salt intake and one discussing fluids intake for HFPEF patients.

Discussion and conclusions

Discussion

The findings have added to knowledge in this field, showing the nature of gap in education, awareness, and knowledge of patients with respect to ambulatory heart failure with preserved ejection fraction HFPEF.

Table 5. Assessing patient education regarding nutrition.

Measure	Items	Frequency	Percentage
Which is a big source of sodium (salt) in the diet?	Processed foods	7	2.9
	Smoked or cured meats	5	2.1
	Table salt	44	18.2
	All of the above*	185	76.4
Which has the LOWEST amount of sodium (salt)?	Fresh fruits*	212	87.6
	Canned vegetables	10	4.1
	Reduced sodium soup	14	5.8
	Frozen dinners	5	2.1
Which food has the MOST sodium (salt)?	Sliced tomato	3	1.2
	Grilled fish	5	2.1
Which dessert has the LOWEST amount of sodium?	Pickles*	231	95.5
	Skim milk	2	0.8
	Hot fudge sundae	17	7
	Baked apple*	154	63.6
Select the fast food with the LOWEST amount of sodium.	Low-fat instant pudding made with skim milk	30	12.4
	Chocolate cake made from a mix	40	16.5
	Fried chicken	12	5
	Cheeseburger	11	4.5
Some people with heart failure are told by their doctor to limit fluids. Which of the following count as fluids?	Baked potato with sour cream and chives*	138	57
	Taco salad	80	33.1
	Water and clear liquids	13	5.4
	Milk, ice cream, and yogurt	38	15.7
The recommended total daily amount of sodium that persons with heart failure should eat is:	Jello, pudding, and soups	26	10.7
	All of the above*	164	67.8
	3000 mg*	9	3.7
	2500 mg	11	4.5
The percentage of Vitamin A:	2000 mg	49	20.2
	500 mg	172	71.1
	5%	16	6.6
	2%	10	4.1
How much sodium is in one serving of soup?	4%*	213	88
	20%	2	0.8
	400 mg*	7	2.9
	470 mg	208	86
	250 mg	15	6.2
	300 mg	11	4.5

Note: *correct answer.

The patients reported that alarming symptoms like swelling of ankle and stomach, or breathing issues, they should immediately contact their physician. Low level of knowledge regarding heart failure and its management leads to social isolation, lack of self-care, worsening of the quality of life, and increased comorbidities.¹ Inheritance of these factors increases health-care costs as the knowledge of patients characterizes their adherence to treatment and its success.^{20,21} The impact of teaching and learning can be measured through assessment tools in health educational programs, which may include possible modifications to the attitudes of patients towards heart failure.¹

There is much variation in the publication of complete instruments, comprehensive psychometric properties, and scoring; educational interventions and knowledge of individuals about heart failure have been reported extensively. The present study has assessed the education level of patients, which revealed that they were aware that patients with HF should avoid salty food, stop smoking, and immediately contact doctor if any alarming symptom is observed. The knowledge of patients regarding their own disease is the initial step towards the development of educational action. A similar study conducted by Bonin et al.¹ assessed the level of knowledge of HF patients in comparison with their socio-economic characteristics. The results showed that higher score was achieved by the patients with greater family income and educational level.

The study findings have shown that majority of the participants had critical gaps in their knowledge of HF and its management. It has been shown that patient-related factors contribute towards adequate or proper knowledge in HF patients. A study conducted by Irene²² determined the self-care behaviour practices and knowledge in HF patients, through cross-sectional analysis. The study found an association between HF knowledge scale scores and self-care behaviour scale scores in demographic variables. The results showed that the level of knowledge in the majority of patients was poor regarding the management of HF, symptom recognition, and management of symptoms.²²

The study is limited in a small number of respects, such as the sample size being comparatively small and using participants from a limited demographic. Therefore, these findings require further confirmatory evidence, which may be met with a larger sample.

Conclusion

The present study has assessed the use of the Atlanta Heart Failure Questionnaire as a tool to evaluate and design tailored education materials for ambulatory

heart failure patients with preserved ejection fraction. This tool met the psychometric properties from its development to its validation. Despite the small sample size, with an average score of 37.9%, the results have depicted the usefulness of Atlanta Heart Failure Questionnaire for filling the gaps, setting a base line and follow-up in the process of educating ambulatory heart failure patients with preserved ejection fraction. For future research, the study has highlighted the need to establish more standardized HF education programs for the patients to minimize gaps in patients' knowledge regarding heart failure with preserved ejection fraction. Moreover, the study recommends assessment of HF knowledge and self-care to be a continuous process, applying the Atlanta Heart Failure Questionnaire to identify and address the deficits, aiming for a better patient care.

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