



Self-Care and Compliance with Medication and Their Relationship to the Quality of Life of Patients with Heart Failure

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Abstract

Introduction Heart failure is a major health problem, often accompanied by limited physical activity and severe effects in various areas of patient quality of life. Self-care, as well as compliance with medication, can further contribute to clinical stability and improved patient outcomes.

Purpose The purpose of this chapter is to assess the effect of self-care and compliance with medication, on the quality of life of patients with heart failure.

Method The research sample consisted of 67 patients diagnosed with heart failure who visited the cardiology outpatient clinic of a general hospital in the capital of Greece. The assessment of self-care behavior was per-

formed by the scale EHFSBS and SCHFI v.6, the Morsiky Green Levine Adherence Scale (MAQ) was used for the evaluation of adherence to medical treatment, while for the evaluation of the quality of life the questionnaire MLWHFQ was used.

Results The multifactorial linear regression analysis showed that age, compliance with medication and scoring in the dimension “Self-care confidence” relates independently to the overall quality-of-life scale rating. In particular, participants over 80 had a significantly higher score, that is, worse quality of life, compared to those under the age of 70 ($p < 0.001$), while participants with low compliance with treatment had a significantly worse quality of life compared to participants with high compliance ($p < 0.001$). It has been noticed that the better self-care they had and the higher compliance with their medication, their quality of life was better.

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Conclusion Self-care behavior and adherence to medical treatment of patients with heart failure are related to their quality of life. Age, educational level, and “Self-care confidence” are factors that influence self-care behavior, compliance with medication, and quality of life. In-depth patient information on the need for adherence to therapeutic guidelines may help to reduce pharmaceutical costs and maximize the therapeutic effect. For this reason, health professionals treating these patients should take into account all the factors that negatively affect their quality of life and treat them with the appropriate interventions.

Keywords

Heart failure · Quality of life · MLHFQ · Self-care · EHFSBS and SCHFI v.6

40.1 Introduction

Heart failure (HF) can be defined as a complex clinical syndrome, due to the heart failure as a blood pump to carry oxygen to the periphery, considering the requirements of peripheral tissues. Typical symptoms of heart failure are easy fatigue, shortness of breath, and fluid retention, but they do not necessarily coexist in the clinical setting [1].

Its frequency has been steadily increasing in recent years in the western world. The higher the number of patients currently surviving a heart attack combined with the increase in life expectancy, and the more effective treatments for the disease contribute to the overall increase in life expectancy in patients with heart failure [2].

The disease has a poor prognosis with a high mortality rate (30–40% of patients diagnosed with heart failure die within a year) but also affects their health and their quality of life. Heart failure is a chronic condition without definitive treatment. It usually worsens over time, although with appropriate treatment (medication, lifestyle changes) it is possible to reduce symptoms and slow the progression of the disease [3].

In recent decades, patients’ adherence to treatment has been a key factor in reducing or even preventing the complications of this clinical syndrome with positive effects on their quality of life.

Research has shown that failure to adhere to treatment leads to poor clinical outcomes, recurrent hospitalizations, complications, worsening of the disease, increased costs of health care, and even death [4–8].

The nature and duration of the disease require the development of patients’ ability to take care of themselves to monitor and manage signs and symptoms of deregulation (sudden weight gain, edema, etc.) and to modify present behaviors or to apply new ones to improve their health and prevent complications [9].

Enhancing patients’ self-care is an issue to improve their prognosis and quality of life. The purpose of this study is to investigate the effect of self-care and compliance on medication in patients with CA at the level of their quality of life. The current and projected incidence of chronic diseases and especially heart failure, means that there is a need to change the way services are provided. In recognition of this need, there is a growing focus on redesigning health care systems and appropriate patient care and support services to improve their quality of life [10].

Chronic diseases, especially those that significantly affect patients’ ability to function, such as heart failure, involve many physical and psychosocial changes, including lifestyle, which often trigger mental disorders such as anxiety and depression.

The treatment of heart failure aims at relieving the symptoms and improving the functionality in the daily life of the patients, in order to achieve the highest level in their quality of life, within the specific limitations imposed by the disease.

Patients with chronic disease become personally responsible for their own day-to-day care and are often better placed by health professionals to assess the severity of their symptoms, the effectiveness of treatment, and the necessary behavioral adjustments to reduce risk factors. Research has shown that proper self-care is asso-

ciated with the prevention or early detection of health problems, better overall health and quality of life in patients with chronic diseases such as heart failure with improved clinical outcomes and reduced health care costs. Unfortunately, self-care among patients with heart failure is usually poor and patients have significant difficulties in self-care [11].

Nowadays, the active participation of patients in treatment is enhanced through detailed information and effective education. However, this requires an assessment of patients' abilities and learning abilities and feedback [9].

40.2 The Effect of Self-Care on the Quality of Life of Patients with Heart Failure

Self-care as a complex and multifaceted phenomenon requires a comprehensive examination of patients, investigation of their learning abilities, consideration of their psychological status, cultural influences, and comorbidity [12].

A non-experimental correlational study by Rockwell and Riegel (2001) [13] analyzed the prognostic factors of self-care in people with heart failure. According to the authors, the severity of symptoms, comorbidity, social support, level of education, age, socioeconomic status, and gender are factors in predicting the self-care of heart failure.

It turned out that only two of the variables examined had a strong effect on self-care factors, education level, and comorbidity. Patients with higher education were associated with compliance and healthy behavior therapy. However, they recognized that a person with a lower level of education can learn self-care, but it takes more time to learn the process. Patients with severe symptoms were found to have high self-care scores. Having experienced frequent outbreaks, these patients became specialists in recognizing severe symptoms and took an active part in self-care. In contrast, people with mild symptoms may have difficulty recognizing the symptoms and understanding the purpose of self-care.

The reviews by Jaasma et al. summarize the recent literature on self-care-related factors.

Factors cited in this theory include experience and skills, motivation, habits, cultural beliefs and values, functional and cognitive abilities, trust, support, and access to care [12, 14].

Compliance is the behavior of the patient, which meets the requirements of care. This term refers to the degree to which a person's behavior in relation to medication is accompanied by a change in lifestyle and diet, which coincides with medical advice.

Compliance is a widely accepted term in the medical literature and implies obedience to the doctor's requirements by reflecting a paternalistic attitude. A better term is adherence but it remains critical. It is defined as "the agreement between doctor and patient and indicates an active process in which the patient is informed, participates in the decision-making process and consciously follows the established treatment" [15].

Low levels of compliance with the recommended treatment are a serious problem in clinical practice. In addition, the result of a negative clinical outcome as a result of low levels of compliance has a significant financial impact. About 23% of inpatient care and 10% of inpatient care in Europe and the United States are the result of low levels of compliance with medication and physician requirements. Annual expenditure on the consequences of non-compliance is estimated at hundreds of billions of euros. Estimates of hospitalization costs due to lack of compliance with medication are very high [16].

40.2.1 Aim of the Study

This study attempts to investigate the relationship between self-care and medication compliance in patients with heart failure with their quality of life.

In particular, its purpose is to investigate the degree of influence of self-care factors and adherence to pharmacotherapy at the level of their quality of life.

So, the research questions of the present research are:

Whether patients with HF who comply with the medication have a higher quality of life compared to patients who do not comply.

Whether patients with HF with self-care behaviors have a higher quality of life than patients who do not take care of themselves.

What other factors can affect their self-care behaviors, compliance with medication and consequently their quality of life.

40.2.2 Questionnaire

For the needs of the research, the questionnaire distributed to the patients is divided into five categories. The first includes questions related to patients' social and demographic characteristics as well as clinical data. The second includes the Greek version of the questionnaire for quality of life (MLHFQ). The third and fourth categories concern the measurement of self-care through the heart failure self-care index (SCHFI v.6) and the European Heart Failure Self-Care Scale (EHFScBS). Finally, the Morisky Green Levine Adherence Scale (MAQ).

40.2.3 Minnesota Living with Heart Failure Questionnaire (MLHFQ)

The MLHF questionnaire was designed to measure the effects of HF on the individual's quality of life. It consists of 21 questions which include two subscales, the emotional and the physical. Questions include issues such as lower extremity edema, sexual activity, hospital stay, costs and side effects of medication, and restrictions on work and leisure [17].

The total score of the scale is calculated by summarizing all the data, with the lowest score being 0 and the highest being 105. The highest score reflects on the worst quality of life. The MLHFQ includes the physical, emotional, social, and mental dimensions. Although the MLHFQ incorporates the relevant aspects of the key dimensions of quality of life, the questionnaire was not designed to measure any particular

dimension separately. The overall score should be taken as the best measure of how heart failure and therapies affect quality of life [17]. The Greek version of the tool was provided by the company MAPI research which owns the copyright translation of the tool, and has been validated in the Greek Cypriot population with HF [18].

40.2.4 European Heart Failure Self-Care Behavior Scale (EHFScBS)

This tool is about self-care with a focus mainly on self-preservation. It is the European Heart Failure Self-Care Behavior Scale (EHFScBS), created in 2003 by Dutch and Swedish researchers [15]. It includes nine questions with a five-point Likert scale (from strongly agree to strongly disagree), which takes 5–10 min to complete and found Cronbach's alpha for a total of 0.81. The total score is calculated as the sum of the scores for each question and ranges from 9 to 45 with the highest scores showing poorer self-care behaviors. In addition to the total score, only the "consulting behaviors" sub-scale of the revised 9-item scale can be used separately.

Recently Vellone et al. proposed a revised standard score of 0–100 for the EHFScBS-9 to make the score easier to interpret and comparable to the Heart Failure Scale (SCHFI) [19].

The EHFScBS scale is used to examine three different theoretical aspects of self-care behaviors: adherence to education, seeking help and adopting self-care behaviors and was originally developed in Dutch. The questionnaire consisted of 12 topics, but was later revised to nine (EHFScBS-9), which exhibited more satisfactory psychometric properties. Data samples used in Sweden, the Netherlands, the United Kingdom, Italy, Germany and Spain showed that the 9-item EHFScBs scale has the ability to generate valid and reliable data. The reliability and validity of the Greek version of EHFScBS (Gr9-EHFScBS) have been checked [20].

40.2.5 SCHFI v.6

This scale originated in America was first published in 2000 and has since been reviewed and revised twice [21].

Its original complex structure with 65 questions has been transformed into a 15-question questionnaire, completed by the patient in 5–10 min, which are divided into three subscales. The first is related to self-preservation, the second to self-management, and the third to self-confidence. It is a tool for measuring self-preservation that is defined as a normal decision-making process that includes the selection of behaviors that maintain normal stability (maintenance) and response to symptoms when they occur [22].

This tool uses a Likert scale to self-report CA self-management success [21]. Numerical values range from 1 to 4, depending on the frequency of self-service maintenance activities.

40.2.6 Morisky Green Levine Adherence Scale (MAQ)

Morisky, Green, and Levine (1986) developed the Drug Adhesion Questionnaire (MAQ) to measure drug adherence for the treatment of hypertension, and the psychometric properties of this scale appeared to be sufficient in their initial study [23]. It is a four-item scale with a yes-no answer form.

The above researchers showed that the MAQ had good predictive power, as individuals who scored in the high-adhesion area had significantly better therapeutic outcomes than those who scored in the low-adhesion range as measured by the MAQ.

40.2.7 Sample and Data Collection

The research was carried out at the Outpatient Cardiology Clinics (Heart Failure Clinic) of a General Hospital in the capital of Greece.

The research was approved by the Scientific Council of the Hospital. The completion of the

study questionnaires was done by the method of personal interview by the researcher. The sample of the study consisted of 67 patients with heart failure, who visited the Heart Failure Clinic of the Hospital. The sampling method was convenience sampling. The patients gave their oral consent for their participation in the research, after being informed about the purpose of the research and after an assurance for the observance of anonymity and that their personal data will not be made public in any way. In addition, patients were informed that their participation was voluntary and that they could withdraw from the study at any time. The criteria for inclusion of patients in the study were to be able to communicate in Greek and to suffer from heart failure. Those suffering from dementia, alcoholism, or taking psychotropic drugs were excluded.

40.2.8 Analysis

Mean values, standard deviations (SD), and median and interquartile range were used to describe the quantitative variables. Absolute (N) and relative (%) frequencies were used to describe the qualitative variables. Student's t-test was used to compare quantitative variables between two groups. Parametric dispersion analysis (ANOVA) was used to compare quantitative variables between more than two groups. To check the type I error, due to the multiple comparisons, the Bonferroni correction was used according to which the significance level is $0.05 / k$ (k = number of comparisons). The Pearson correlation coefficient (r) was used to control the relationship between two quantitative variables. The correlation is considered low when the correlation coefficient (r) ranges from 0.1 to 0.3, moderate when the correlation coefficient ranges from 0.31 to 0.5, and high when the coefficient is greater than 0.5. Linear regression analysis with the stepwise integration / subtraction process was used to find independent factors related to the various scales from which dependence coefficients and their standard errors (standard errors = SE) were derived). The significance levels are bilateral and the statistical significance was set at 0.05. The

statistical package SPSS22.0 was used for the analysis.

40.3 Results

The sample consists of 67 people. Table 40.1 gives the demographic data of the participants. 68.2% of the participants were men. Also, 55.2% were between 71 and 80 years old. The average body mass index (BMI) of the participants was 28.5 points (SD = 2.6 points) and 80.6% of participants were overweight. 68.7% of the participants were married and 55.2% were primary school graduates. Still, 25.4% of the participants were private employees and 23.9% were unemployed. About 43.3% of participants had low compliance with the treatment, 26.9% had medium and 29.9% had high.

40.3.1 Minnesota Living with Heart Failure Questionnaire

Table 40.2 gives the participants' scores on the dimensions of the quality-of-life scale.

Higher prices indicate a worse quality-of-life.

The score in the physical subscale ranged from 5 to 31 points, with an average value of 16.63 points (SD=6.38 points) while the score in the emotional scale ranged from 2 to 19 points, with an average value of 9.81 points (SD=4.29 points). The total score of MLHFQ ranged from 11 to 63 points, with an average value of 34.29 points (SD=12.54 points).

Table 40.3 below gives the overall score of the participants in the quality-of-life scale according to their demographics and their compliance with the treatment.

The overall score was found to differ significantly depending on the age of the participants. Specifically, after the Bonferroni correction, participants over the age of 80 were found to have a significantly higher score, that is, worse quality of life, compared to both participants who were under the age of 70 ($p < 0.001$) and those who were 71-80 years ($p = 0.006$). Also, participants who were 71-80 years old had a significantly

Table 40.1 Demographic data of the participants

		N	(%)
Gender	Men	45	(68.2)
	Women	21	(31.8)
Age	41-50	3	(4.5)
	51-60	5	(7.5)
	61-70	10	(14.9)
	71-80	37	(55.2)
	>80	12	(17.9)
BMI, mean (SD)		28.5 (2.6)	
BMI	Normal weight	4	(6.0)
	Overweight	54	(80.6)
	Obesity	9	(13.4)
Marital status	Married	46	(68.7)
	Single	3	(4.5)
	Divorced	6	(9.0)
	Widow	12	(17.9)
Educational level	Elementary school	37	(55.2)
	High school	11	(16.4)
	Senior high school	15	(22.4)
	University	4	(6.0)
Occupation	Unemployed	16	(23.9)
	Civil servants	12	(17.9)
	Private servants	17	(25.4)
	Trained craftsmen (furniture makers, drivers, etc.)	10	(14.9)
	Partially trained (farmers, etc.)	4	(6.0)
	Unskilled (unskilled workers, etc.)	8	(11.9)
Morisky Green Levine Adherence Scale	Low	29	(43.3)
	Medium	18	(26.9)
	High	20	(29.9)

Table 40.2 Scores of participants in the dimensions of the quality-of-life scale

	Min	Max	Mean	SD
Physical subscale	5.00	31.00	16.63	6.38
Emotional subscale	2.00	19.00	9.81	4.29
MLHFQ total score	11.00	63.00	34.29	12.54

higher score, that is, worse quality of life, compared to participants who were under 70 years old ($p = 0.032$). Also, elementary/high school graduates had significantly worse quality of life compared to high school graduates and university graduates. Manual workers had a significantly

Table 40.3 Overall score of the participants in the quality-of-life scale according to their demographic data and their compliance with the treatment

		MLHFQ		P
		Total score		Student's t-test
		Mean	SD	
Gender	Men	33.45	11.94	0.304
	Women	37.11	13.47	
Age	≤70	25.07	9.97	<0.001*
	71–80	34.03	11.44	
	>80	45.75	8.89	
Obese	No	33.56	12.21	0.226
	Yes	39.71	14.61	
Married	No	35.47	15.76	0.649
	Yes	33.81	11.16	
Educational level	Elementary/high school	37.00	12.56	0.004
	Senior high school/	26.33	8.72	
Occupation	University			0.027*
	Unemployed	37.50	14.79	
	Civil/private servants	29.08	12.09	
	Trained craftsmen	38.10	9.51	
Morisky Green	Low	43.00	9.19	<0.001*
Levine	Medium	30.53	12.53	
Adherence	High	24.13	6.48	

Table 40.4 Pearson correlation coefficients of the overall score with the BMI and the participants' self-care scales SCHFI v.6 and EHFSsBs

		MLHFQ
		Total score
BMI	r	0.20
SCHFI v.6-self-care preservation	P	0.132
	r	-0.64
	P	<0.001
SCHFI v.6-self-care management	r	-0.51
SCHFI v.6-self-care confidence	P	<0.001
	r	-0.59
EHFSsBs	P	<0.001
	r	-0.63
	P	<0.001

worse quality of life compared to public /private employees ($p = 0.044$). In addition, participants with low adherence to treatment had significantly worse quality of life compared with participants with moderate adherence ($p < 0.001$) and participants with high adherence ($p < 0.001$).

Table 40.4 shows the Pearson correlation coefficients of the overall score with the BMI and the participants' self-care scales SCHFI v.6 and EHFSsBs.

There were significant negative correlations of the overall score with all participants' self-care scales. Therefore, the higher the self-care of the participants, the lower their overall score, indicating a better quality of life. Subsequently, a multifactorial linear regression took place, with the overall quality of life score as a dependent variable and the demographics of the participants, their compliance with the treatment and the self-care scales as independent. The results of Table 40.5 were found by the stepwise method.

Age, adherence to treatment, and the "Self-care confidence" score were found to be independently related to the overall score. Specifically, participants who were under 70 years old had a score of 12.72 points lower, that is, better quality of life, compared to participants who were over 80 years old. Participants who were 71–80 years old had a score of 6.65 points lower compared to participants who were over 80 years old. Participants who had moderate compliance with the treatment had an 8.28-point lower score compared to participants who had low compliance. Participants who had high compliance with the treatment had a score of 8.67 points lower com-

Table 40.5 Multifactorial linear regression between overall quality-of-life score and demographics, compliance with treatment and participants' self-care scales

		β^a	SE ^b	P
Age	>80 (reference.)	-12.72	3.77	0.001
	<=70			
	71–80	-6.65	3.08	0.035
Morisky Green	Low (reference)			
Levine	Medium	-8.28	2.98	0.008
Adherence	High	-8.65	4.17	0.043
SCHFI v.6-self-care confidence		-0.15	0.07	0.045

^aDependency factor; ^bStandard rate error

pared to participants who had low compliance. As the score increased in the “Self-care confidence” dimension, their overall score decreased, indicating an improvement in their quality of life.

40.4 Discussion

The aim of this study was the effect of self-care and compliance on the medication of patients with heart failure in their quality of life, possible factors that have a positive or negative effect on them, as well as whether the two variables (self-care, compliance) are related to dimensions of health-related quality of life, physical (physical) and mental.

Age, educational level, adherence to education, and “confidence in self-care” were found to be more correlated with the quality of life of the participants. Particularly, the statistical analysis showed that 43.3% of the participants had low compliance with the treatment, 26.9% had moderate, and 29.9% had high.

Compliance levels are relatively good in relation to studies in other countries such as Palestine and Peru, which raise low compliance rates to 50–60% [1, 4] but lag behind other developed countries such as the USA and Canada show high compliance with treatment (74.8 and 77.4%, respectively).

Also, of the factors that affect patient compliance, only educational level was found to be positively correlated as high school graduates and university graduates were 4.21 times more likely to have high compliance with education compared to elementary/high school graduates.

Education level is one of the factors, which according to studies has shown to be potentially involved with compliance levels without always providing a correlation, because it cannot be a truly independent factor [24].

In terms of self-care, only the educational level was found to be significantly related to the participants' score in all three dimensions (maintenance, management and self-care confidence). Specifically, high school graduates and university graduates had a higher score, that is, more self-care and confidence in their self-care compared to elementary/high school graduates. The same conclusion was reached by the study of Rockwell and Riegel (2001) [13]. The higher level of education helps patients to understand the tips and guidelines related to their behavior for self-care in order to gain sufficient experience and skill.

Especially in terms of self-care management, obese people had a lower score, that is, worse self-care management, compared to non-obese participants, while manual workers had a lower score compared to public and private employees.

According to this research, self-confidence seems to be an important factor influencing the self-care of heart failure, even in patients with cognitive impairment and contributing to better emotional health. Similarly, Polykandrioti et al. (2009), Spyraiki et al. (2008), Franzen et al. (2007), and Yu et al. (2004) had concluded in the same results [7, 25–27]. This finding is also consistent with a recent study by Vellone et al. [16] in which self-confidence may be more important than knowledge to influence self-care behaviors in adults with heart failure. According to them,

interventions aimed at trust should be considered as a way to improve self-preservation in this population.

According to the results of the study, most patients had a relatively stressful quality of life with a mean value on the MLHFQ scale of 34.29 ± 12.54 with a range of 0–105. Our findings also confirm those of Spiraki et al. [26] who found low quality of life in patients with heart failure.

There was a significant positive correlation between all dimensions of the quality-of-life scale. So, the better their physical health, the better their emotional health and overall quality of life. Similarly, the better their emotional health, the better their physical health and overall quality of life. Jaarsma et al. [15] found, however, only a correlation between self-care behavior and the psychosocial dimension of quality of life. Age, adherence to treatment, and self-esteem scores were found to be independently related to the physical (physical) dimension of quality of life.

Specifically, participants who were under 70 years old had better physical health than those who were over 80. The higher the compliance, the better the physical health of the participants. As the score in the “selfconfidence” dimension increased, so did their score in the physical dimension, indicating an improvement in their physical health.

Age and adherence to treatment were found to be independently related to the emotional dimension of quality of life. In particular: Participants who were under 70 years old had better emotional health compared to those who were over 80. Also, those who had moderate compliance with the treatment showed better emotional health, compared to participants who had low compliance.

In terms of age, from the analysis of the data of the present study, the largest percentage of the sample (55.2%) belonged to the age group 71–80, a finding that agrees with the literature, which claims that the prevalence of the disease increases with age [28]. This finding is probably due not only to the physical problems caused by the disease, but also to other problems accompanying this age, such as emotional problems resulting from social isolation and reduced activity [29].

These findings converge with the studies of Rustoen et al. [30], Gott et al. [10], Jaarsma et al. [14], according to which the older the age, the quality of life is most negatively affected.

The importance of social isolation in the age-quality relationship is also supported by the results of the study of Asadi-Lari et al. [2] where it was found that the worst quality of life due to greater social isolation was manifested by people aged <65 years.

Regarding the educational level, as shown by other researches, the high educational level has a positive correlation with the quality of life as patients with a higher educational level understand more easily the therapeutic requirements of their disease and finally enjoy a better standard of living [16]. Therefore, the low level of education not only seems to be related to compliance with treatment, but also to the high rate of readmissions to the hospital according to the conclusions of Rustoen et al. [30], Lee et al. [24].

The study found a significant correlation between self-care behavior and medication compliance and quality of life. It has been observed that the better the self-care behavior of patients with heart failure and the higher their compliance the better their overall quality of life.

Factors affecting self-care behaviors, medication compliance and, consequently, their quality of life were also identified. The health professionals who treat these patients must take into account all the factors that negatively affect the quality of life and treat them with appropriate interventions.

The importance of the study lies in the emergence of the nurse as the ideal health professional in promoting self-care. Findings from studies show that nursing interventions through the use of appropriate training programs have the potential to improve emotional health and subsequently the overall quality of life of patients with heart failure [31].

In addition, through the detailed information of the patient about the necessity of adherence to the treatment instructions, it was possible to reduce the pharmaceutical costs, maximize the therapeutic effect, and at the same time improve the quality of life of the patients.

Compliance with treatment is considered one of the most important health policy interventions, which contributes significantly to the improvement of health outcomes and the containment of consistent health expenditures. Inadequate or non-compliance with treatment leads to an increase in the use of health services and an increase in the cost of health care consequently.

40.5 Limitations of the Study

1. The main limitation of the present study is the small sample of patients as it affects the representativeness of our population and generalization of the results.
2. The time period in which the data were collected was also relatively short.
3. Heterogeneity of the sample in terms of stage, type and etiology of Heart Failure.
4. The sample of the study includes patients from the Outpatient clinic of a single General Public Hospital and not from other Hospitals (public or private) or private cardiology clinics. These patients are usually of lower socioeconomic status than those who have the opportunity to turn to private health care providers.
5. Sampling was performed at a single given time in the course of the disease and the research would be more thorough if patients were asked at other times.

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