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Original Article

Treatment adherence in heart failure patients followed up by nurses in two specialized clinics

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Objectives: to analyze treatment adherence in heart failure (HF) patients followed up by the nursing staff at specialized clinics and its association with patients' characteristics such as number of previous appointments, family structure, and comorbidities. Methods: a cross-sectional study was conducted at two reference clinics for the treatment of HF patients (center 1 and center 2). Data were obtained using a 10-item questionnaire with scores ranging from 0 to 26 points; adherence was considered adequate if the score was ≥ 18 points, or 70% of adherence. Results: a total of 340 patients were included. Mean adherence score was 16 (±4) points. Additionally, 124 (36.5%) patients showed an adherence rate ≥ 70%. It was demonstrated that patients who lived with their family had higher adherence scores, that three or more previous nursing appointments was significantly associated with higher adherence ($p<0.001$), and that hypertension was associated with low adherence ($p=0.023$). Conclusions: treatment adherence was considered satisfactory in less than a half of the patients followed up at the two clinics specialized in HF. Living with the family and attending to a great number of nursing appointments improved adherence, while the presence of hypertension led to worse adherence.

Descriptors: Heart Failure; Nursing; Patient Compliance.

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Introduction

Heart failure (HF) is a complex syndrome accounting for a considerable number of hospitalizations, which may be related to inadequate adherence to treatment and also to the difficulty in recognizing signs and symptoms of disease decompensation[1]. Analyzing patients' adherence to treatment is essential to identify the factors that may interfere with their choices and to implement early strategies to reduce crises of HF decompensation and consequent unplanned hospitalizations[2].

Understanding patients' and professionals' adherence is a complex process that goes from compliance with and monitoring of the treatment prescribed, including patients' involvement in the definition of their care plan, to the search for well-being and health, represented by changes in lifestyle that include attending medical appointments and having a greater control of medications[3].

A systematic review that aimed to identify and summarize the effectiveness of intervention strategies to improve adherence to medications in a population of HF patients found that there is little evidence on strategies that isolatedly improve treatment adherence[4]. This result indicates that adherence should be considered a multifactorial issue by the nursing staff, since several factors may be involved in this behavior, such as therapeutic regimen, socioeconomic aspects, cognitive problems, and associated comorbidities[5].

With regard to therapeutic regimen, the use of educational strategies implemented by nurses to improve knowledge of patients with HF on disease, treatment, and treatment adherence may have a positive effect. This can be observed in a prospective study of an outpatient cohort of 308 HF patients from three university hospitals located in the metropolitan area of Atlanta, which found that several self-care recommendations were associated with better adherence rates and fewer hospitalizations for all causes[6].

Over the past few decades, HF clinics have made many efforts to educate patients about knowledge on disease and treatment and about treatment adherence. Basically, this concept of patient education has been implemented in several centers worldwide for over the last 20 years to improve these aspects and reduce the high hospitalization rates[4].

Although several studies have been published about the low adherence rates in patients admitted with decompensated HF, little is known about treatment adherence in HF patients followed-up at specialized clinics that have been applying this approach during the last two decades. This study filled this gap in knowledge in health, especially in the nursing field, since nurses have a key role in educational interventions and monitoring of decompensation signs[4]. In view of that, the aim of the present investigation was to analyze treatment adherence in HF patients followed up by the nursing staff at specialized clinics and its association with patients' characteristics such as number of previous appointments, family structure, and comorbidities.

Methods

Study design

This was a cross-sectional study conducted at two clinics specialized in providing outpatient care to patients with chronic HF followed up by nurses.

Setting

The present study was conducted at public university institutions located in the cities of Porto Alegre, Southern Brazil, and Niterói, Southeastern Brazil. The decision to evaluate these two settings was motivated by the similarities between both institutions, which combine teaching, research, and multidisciplinary care specialized in HF patients. Data collection took place from August 2011 to December 2012 in Porto Alegre (center 1) and from January 2012 to October 2013 in Niterói (center 2).

A survey was conducted in both centers to determine the total number of patients seen per week during the study period. The researchers visited the clinics on the days scheduled for outpatient appointments to select patients who met the inclusion criteria. Before the appointment, patients were invited to participate in the study and subsequently read and signed the written consent form (WCF). A convenience sampling strategy was used to select patients who met the inclusion criteria and agreed to participate in the study.

Participants

The sample included adult patients diagnosed with chronic HF who had attended to at least one nursing appointment at centers 1 and 2 in the last six months before being enrolled in the study and who had preserved communication ability. In these appointments, nurses provided patients with knowledge on HF, self-care, and treatment adherence. Patients with cognitive impairment reported in their medical

records and confirmed during the application of a WCF were excluded from the study.

Variables and data collection

We investigated sociodemographic, clinical, and treatment adherence variables. Sociodemographic variables included age, gender, family structure (living with the family, alone or at geriatric clinics), educational attainment (years of schooling), marital status, and patient's monthly income (family income if appropriate). Clinical variables were body weight, smoking, time of disease progression, time of follow-up at the clinic, New York Heart Association functional class, and comorbidities, such as diabetes mellitus, chronic renal failure, coronary artery disease, depression, cancer, and hypertension. We also collected the number of previous appointments with the nursing staff at the specialized clinics, when patients received educational interventions on disease knowledge, self-care, and treatment adherence.

Treatment adherence was assessed using a 10-item questionnaire developed and validated in Brazil for use in HF patients[7]. The ten questions include one on the use of medication, one on weight control, three on dietary habits, three on liquid intake, one on the consumption of alcoholic beverages, and one on attendance to the scheduled appointments. Scores of this questionnaire range from 0 to 26 points; the higher the score, the better the adherence. Adherence was considered adequate if the patient showed a score equal to or higher than 18 points, corresponding to 70% adherence[8]. The questionnaire was administered through an interview that lasted for approximately 15 minutes and was performed before the appointment, depending on patient's availability. Nursing appointments and data collection through patient interviews were carried out by appropriately trained researchers. All variables were collected by patient's verbal report and checked on medical records from the same day of the appointment.

Sample size

Sample size was estimated at 340 patients, based on a percentage of 52% adherence found in a previous study with patients followed up at a HF clinic[7], considering a 95% confidence level and a 5% margin of error and using the Winpepi statistical software (version 11.1).

Ethical aspects

This project was approved by the Research Ethics Committee of both institutions under protocol numbers 11-0268 and 335-744.

Statistical analysis

Data were typed on a Microsoft Excel database and analyzed using the Statistical Package for Social Sciences (SPSS) statistical package version 19. Continuous variables were expressed as mean and standard deviation for those with symmetric distribution and median and interquartile range for those with asymmetric distribution. Categorical variables were expressed as absolute numbers and percentages. The association between adherence scores and clinical or sociodemographic variables was assessed using the chi-square test. Statistical comparison between groups divided according to the cut-off point for adherence was performed using the Mann-Whitney test for quantitative clinical variables and the chi-square test for categorical variables. A two-tailed $P<0.05$ was considered statistically significant.

Results

Sociodemographic and clinical characteristics

During the study period, 367 patients were potentially eligible. Seven of them were excluded because they were having their first nursing appointment, one did not agree to participate in the study, and 20 patients met at least one exclusion criterion. A total of 340 patients were included, 223 from center 1 and 117 from center 2. Table 1 show sociodemographic and clinical characteristics of this sample.

Table 1 - Sociodemographic and clinical characteristics of the sample (n=340). Porto Alegre, Southern Brazil, and Niterói, Southeastern Brazil, 2014

Variables	n=340
Age, years*	62±12.5
Male gender†	207 (61)
Weight, kg‡	74 (64 – 85)
Educational attainment, years of schooling‡	5 (3-9)
Lived with family†	301 (88.5)
Marital status (married)†	222 (65)
Family income, Brazilian reais‡	1000 (622 – 1500)
Smoking†	131 (38.5)

(continue...)

Table 1 - (continuation)

Variables	n=340
Number of previous appointments with the nursing staff‡	2 (1-6)
Time of disease progression, months‡	60 (24-96)
Time of follow-up at the HF outpatient clinic, months‡	48 (24-72)
New York Heart Association functional class†	
I	97 (28.5)
II	154 (45)
III	69 (20)
No evaluation of functional class	20 (6)

* Mean ± standard deviation
† n (%)
‡ Median (interquartile range 25-75)

Treatment adherence

Overall mean adherence score was 16±4 points. A total of 124 (36.5%) patients showed an adherence rate equal to or higher than the cutoff point (70%, or 18 points). Of these, 50% had attended to at least four nursing appointments prior to being included in the study. At least 50% of the patients who showed adherence scores below the cutoff point had attended to only one nursing appointment.

Table 2 presents the patients divided into two groups: one including those with satisfactory adherence (score ≥ 18 points) and another including those with low adherence (score < 18 points). It was observed that HF patients who lived with their family showed higher adherence scores than those who lived alone or at geriatric clinics. Three or more previous nursing appointments was significantly associated with higher adherence (p<0.001). The presence of hypertension as a comorbidity was associated with low adherence (p=0.023).

Table 2 - Comparison between adherence scores and sociodemographic and clinical characteristics. Porto Alegre, Southern Brazil, and Niterói, Southeastern Brazil, 2014

Variables	Total n = 216	Total n = 124	p-value
	Adherence score<18	Adherence score≥ 18	
Gender*			
Male	136 (63)	71 (57)	0.356
Lived with family*	183 (84.5)	118 (95)	0.001
Marital status*			
Married	131 (61)	91 (73)	0.108
Single	33 (15)	11 (9)	
Widowed	14 (6.5)	7 (6)	
Divorced	14 (6.5)	7 (6)	
Educational attainment, years of schooling†	5 (4-9)	5 (3-9)	0.307
Family income, Brazilian reais†	1000 (622-1500)	1000 (545-1575)	0.913
Body weight, kg†	76 (65-86)	72 (62-82)	0.760
Number of previous appointments with the nursing staff†	1 (1-4)	4 (2-10)	< 0.001
Comorbidities*			
Diabetes	76 (35)	38 (31)	0.463
Chronic renal failure	12 (6)	7 (6)	1.0
Coronary arterial disease	50 (23)	33 (27)	0.559
Depression	17 (8)	8 (6.5)	0.790
Cancer	16 (7)	7 (6)	0.690
Hypertension	164 (76)	79(64)	0.023

* n (%) and chi-square test
† Median (percentiles 25-75) and Mann-Whitney test

Patients' answers to the 10-item questionnaire

Table 3 shows patients' answers to the ten questions from the questionnaire and the best answer in terms of adherence.

Table 3 - Answers of heart failure patients to questions from a questionnaire on treatment adherence. Porto Alegre, Southern Brazil, and Niterói, Southeastern Brazil, 2014

Questions	n (%)
In the last 15 days, have you taken your medications according to medical prescription? (always)	284 (83.5)
How often do you weigh yourself? (every day)	13 (4)
Do you add salt to your food? (I don't use salt in food - nothing)	11 (3)
Do you add ready-made seasoning, such as chicken broth and tomato sauce, when preparing food? (I don't use it - nothing)	174 (51)
Do you restrict salt intake when cooking or eating out? (always)	123 (36)
Do you include soups, ice cream, jelly, juice, milk, tea, coffee, non-alcoholic beverages in your recommended amount of daily fluid intake? (always)	149 (44)
Have you reduced fluid intake according to the recommendations of your physician or nurse? (always)	180 (53)
Do you include the liquid (juice) from fruits such as orange, watermelon, pineapple, tangerine, etc., and coconut water in your recommended daily amount of fluid intake? (always)	132 (39)
Do you take alcoholic beverages? (never)	271 (80)
In the last 15 days, have you missed a scheduled appointment or examination? (never)	284 (83.5)

Discussion

This study presents the results of an analysis on treatment adherence of patients followed-up at two clinics specialized in HF. Results indicate that, despite the setting where the study was conducted, adherence rate was not entirely satisfactory. Conversely, a very positive finding was the fact that higher treatment adherence was associated with a greater number of previous nursing appointments and with living with the family. The presence of hypertension as a comorbidity led to lower treatment adherence.

Many studies have discussed different educational approaches to improve treatment adherence of HF patients[4,7,9-10]. In a study conducted with 252 patients admitted for HF in Southern Brazil, who had mean age of 63±13 years and were predominantly white males, it was found that 112 (47%) patients reported high adherence to pharmacological treatment, while only 45 (18%) adhered to non-pharmacological treatment. Adherence was higher in patients who had knowledge on the non-pharmacological management of the disease, reinforcing the importance of educational interventions in this group[9]. Recently, a clinical trial in which nurses performed an educative intervention composed of home visits and phone calls during a six-month follow-up period showed positive results in terms of adherence, knowledge, and self-care[8]. These results corroborate our finding that a greater number of nursing appointments at specialized clinics leads to a higher treatment adherence score.

In the present study, family support was pointed out as an important factor for better treatment adherence, revealing that 88.5% of study patients lived with their family. There has been evidence that family support is a predictor of adequate adherence and that poor family functioning compromises the complex HF therapeutic regimen[11-14]. Single HF patients or those who live alone are more prone to develop depression and to have poor quality of life, low life expectancy, and a greater number of hospitalizations[13-15]. It is believed that the social support provided by family preserves mental health and increases the well-being of HF patients, thus motivating treatment adherence.

Among the comorbidities assessed, hypertension was the one that was associated with the worst adherence and represented the main reason for seeking primary health care. According to the literature, low adherence was found to be the main reason for treatment failure; in patients with uncontrolled hypertension, treatment adherence rate is nearly 50%[16]. Additionally, around 40% from 60% of hypertensive individuals did not use the prescribed medications properly, a percentage that was even higher when it comes to measures to change their lifestyle, such as starting a diet, performing physical activity, quitting smoking, and avoiding alcohol intake[16]. There are several reasons for the difficulty in adhering to hypertension treatment, e.g., absence of symptoms associated with the disease, complexity of the dosage regimen, high treatment cost, and lack of knowledge about the disease[17].

In a cross-sectional study with 385 hypertensive patients diagnosed for at least 6 months and seen at a primary health care unit, physical activity was reported by 29.6% of patients, but only 17.7% reported regular physical activity. A total of 69.1% of subjects made adjustments in their diet, which comprised mainly restricted salt, fat and sugar intake[18].

Treatment adherence of hypertensive individuals, which is already considered low by itself[19], decreases even more when hypertension is associated with HF. In this situation, it is more difficult to follow the prescribed

treatment, because the number of medications increases, as well as treatment costs and lifestyle restrictions.

As shown in Table 3, the highest adherence score was observed for questions related to issues often discussed during the care of HF patients, i.e., proper compliance with the treatment prescribed, adequate fluid intake, alcohol restriction, and attendance to appointments, which corroborates the finding that patients with a greater number of nursing appointments showed better adherence.

In the present investigation, subjects showed lower adherence to measures related to monitoring weight daily, adopting a low-sodium diet, and including fruit juice in the amount of daily fluid intake. Many studies have discussed low-sodium diet, as well as its relationship with fluid accumulation and therapeutic adherence, and identified flavor of foods, difficulty in preparing healthy meals, and need of eating out as barriers to adherence[4,18,20].

These pieces of evidence show the need of paying special attention to specialized medical and nursing care to HF patients and their family by implementing strategies that may improve patients' adherence and self-care, and thus their quality of life.

Study limitations

Few comprehensive instruments to assess treatment adherence in HF patients are available in the literature. In the present study, we applied a questionnaire developed in Brazil to be used in HF patients seen at clinics that work with the concept of multidisciplinary care. Questions on changes in lifestyle, which would be also valid for other chronic diseases, were not addressed by the authors who developed the questionnaire. In this sense, the present investigation demonstrated the limitations of this instrument to the scientific community, and additional studies may contribute to the assessment of other life habits essential for the health control of HF patients. Moreover, further studies are needed to corroborate findings for adherence behavior in HF patients seen at specialized clinics.

Conclusion

The results from this study allowed us to conclude that less than a half of the patients followed up at the two clinics specialized in HF were considered to have satisfactory adherence. Also, living with the family and attending to a great number of nursing follow-up appointments improved treatment adherence, while the presence of hypertension led to worse adherence.

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