

Treatment adherence in patients with heart failure receiving nurse-assisted home visits

Adesão ao tratamento de pacientes com insuficiência cardíaca em acompanhamento domiciliar por enfermeiros

Vanessa Monteiro Mantovani¹

Karen Brasil Ruschel¹

Emiliane Nogueira de Souza¹

Claudia Mussi¹

Eneida Rejane Rabelo-Silva¹

Keywords

Patient compliance; Nursing care; Nursing, practical; Heart failure; Home visit

Descritores

Adesão do paciente; Cuidados de enfermagem; Enfermagem prática; Insuficiência cardíaca; Visita domiciliar

Submitted

September 1, 2014

Accepted

September 15, 2014

Abstract

Objective: To assess treatment adherence in patients with heart failure receiving nurse-led home visits after hospital discharge.

Methods: This was a before-and-after study involving patients who had been recently hospitalized for decompensated heart failure. Three home visits were conducted within 45 days of hospital discharge. Treatment adherence was assessed in the first and third visits through a 10-item questionnaire (cutoff point: 18 = 70% adherence). In the first and second visits, patients were educated as to their condition, treatment adherence and self-care.

Results: There were 32 patients included, mean age 65 ± 16 years, 18(58%) male. The 32 patients received a total of 96 home visits. Treatment adherence scores were of 16 ± 2.6 vs 20.4 ± 2.7 in the first and third visits, respectively ($p=0,001$). Weight monitoring and liquid restriction behaviors improved significantly following the intervention.

Conclusion: The in-home educational intervention led to significant improvements in the treatment adherence of recently-hospitalized patients with heart failure.

Resumo

Objetivo: Verificar a adesão ao tratamento de pacientes com insuficiência cardíaca em acompanhamento domiciliar por enfermeiras após alta hospitalar.

Método: Estudo tipo antes-depois realizado com pacientes recentemente internados por insuficiência cardíaca descompensada. Três visitas domiciliares foram realizadas após alta em um intervalo de 45 dias. Avaliou-se a adesão na primeira e terceira visitas através de um questionário validado (10 questões, ponto de corte 18 pontos=70%=adesão satisfatória). Durante a primeira e segunda visitas, os pacientes receberam educação quanto à doença, adesão e autocuidado.

Resultados: Foram incluídos 32 pacientes, idade média 65 ± 16 anos, 18(58%) masculinos. Os 32 pacientes receberam um total de 96 visitas domiciliares. Os escores de adesão foram 16 ± 2.6 vs 20.4 ± 2.7 na primeira e terceira visitas, respectivamente ($p=0,001$). Questões como peso e restrição hídrica aumentaram significativamente após a intervenção.

Conclusão: A intervenção de educação no domicílio melhorou significativamente a adesão ao tratamento de pacientes com insuficiência cardíaca e internação recente.

Corresponding author

Eneida Rejane Rabelo-Silva
São Manoel street, 963, Porto Alegre,
RS, Brazil. Zip Code: 90620-110
eneidarabelo@gmail.com

DOI

<http://dx.doi.org/10.1590/1982-0194201500008>

¹Universidade Federal do Rio Grande do Sul, Porto Alegre, RS, Brazil.

Conflicts of interest: there are no conflicts of interest.

Introduction

Over the past two decades, non-pharmacological treatments for heart failure have led to significant reductions in hospital readmission rates as well as substantial increases in survival rates and, especially, in patient quality of life.^(1,2) Such interventions are mostly based on health education and on the provision of information regarding heart failure and the importance of self-care for its management. Some of the main topics approached by these interventions are hydrosaline restriction, physical activity, daily weight monitoring, as well as the early recognition of signs and symptoms of decompensation.⁽³⁾

Although both health education and pharmacological interventions have been increasingly integrated into patient care, the hospital readmission rates for patients with heart failure are still high.⁽⁴⁾ Studies have found that the main reasons for rehospitalization are poor treatment adherence and the patient's inability to identify the signs and symptoms of cardiac decompensation.⁽⁵⁻⁷⁾

Several strategies have been implemented in an attempt to improve treatment adherence in patients with heart failure. Telephone monitoring and home visits, for instance, have both been shown to lead to improved treatment adherence and self-care.^(1,2,8) Home visits have been found to be an effective way to approach patients and their families to provide information regarding heart failure and self-care. Home visits allow for the reinforcement and follow-up of the instructions provided at hospital discharge, the systematic assessment of treatment adherence, as well as for the recognition of signs and symptoms of decompensation.^(9,10)

The present study was developed to further assess the benefits of home visits on the treatment adherence of patients with heart failure who had been recently hospitalized due for decompensation. Our goal was to assess treatment adherence in patients with heart failure who received home visits from nurses following hospital discharge, in which they received information regarding heart failure and its treatment. This study is especially relevant given the association between treatment

adherence, clinical stability and a lower number of decompensation episodes.

Methods

This was a before-and-after experimental study conducted on patients who had been hospitalized for decompensated heart failure in two reference hospitals in the state of Rio Grande do Sul, south of Brazil. Nursing interventions and the assessment of treatment adherence were performed in patients' homes following hospital discharge through three home visits made by specialist nurses over a 45-day period. The first home visit occurred within seven to ten days of hospital discharge, while the second took place 15 to 20 days after patients were released from the hospital and the third, 15 to 20 days following the second visit.

Participants were recruited through convenience sampling of individuals hospitalized for decompensated heart failure. The sample was composed of individuals of both genders, aged at least 18 years, with a left ventricular ejection fraction $\leq 45\%$, who lived within 25km of the hospitals in which the study was conducted. Patients with communication impairments or degenerative neurological diseases were excluded from the study.

Sample size was calculated based on the study in which the previously mentioned treatment adherence questionnaire was developed.⁽²⁾ The calculations suggested that a sample of 32 patients, each receiving two visits (for a total of 64 visits) would be required to detect results at 5% significance with 80% power.

Identification, clinical data (anthropometric measurements, current and prior medical history, comorbidities, echocardiography results, pharmacological treatments), and demographic information (gender, age, socioeconomic status, education level) were collected from all patients who met inclusion criteria and agreed to participate in the study.

Treatment adherence was assessed using a questionnaire designed for this specific purpose, which has already been adapted and validated for use in Brazil.⁽²⁾ The instrument contains ten questions

regarding the use of prescribed medications, daily weight monitoring, salt and water intake and the attendance of medical appointments and examinations scheduled. The questions have three to four alternative responses, and can receive scores of zero to three or zero to four, respectively. Question scores can be summed to provide a total treatment adherence score ranging from zero to 26. A score of 18 was considered the minimum cutoff for treatment adherence, as it corresponded to an adherence rate of 70%.

After the instrument was administered in the first home visit, a physical exam was performed to look for clinical signs of decompensated heart failure. Functional status was assessed using the New York Heart Association criteria, which classifies participants in categories ranging from I to IV, where I indicates an absence of symptoms and IV suggests the presence of symptoms of heart failure at rest.⁽¹¹⁾ Patients then received information about heart failure and its treatment, and the following topics were discussed: adequate salt and water intake, daily weight monitoring, identification of signs and symptoms of decompensated heart failure, the mechanism of action and side effects of the medications prescribed, and influenza and pneumonia vaccines. At the end of the home visit, any remaining questions asked by patients and family members were answered.

The second home visit occurred two weeks after the first, and involved a physical assessment and an evaluation of patient functional class. Patients or family members had their questions answered by the visiting nurse, who also reiterated all treatment and self-care recommendations. The third visit occurred two weeks after the second, and included the administration of the same adherence questionnaire used in the first visit, with the aim of identifying changes in treatment adherence associated with the home visits. A physical examination and an assessment of patient functional class were also performed. After these moments, the instructions provided in the previous visits were reinforced.

Normally-distributed continuous variables were described as means and standard deviations, while

categorical variables were expressed as absolute frequencies and percentages. Treatment adherence scores were compared using paired t-tests, and results were considered significant at $p < 0.05$.

The development of the study followed the development of national and international standards of ethics in research involving human subjects.

Results

A total of 32 patients with a mean age of 65 ± 16 years were included in the study, of whom 18 (58%) were male. Most patients lived with at least two family members. Fifty percent of participants had up to six years of education and earned three minimum wages or less. The most prevalent cause of heart failure was ischemia, and the mean ejection fraction in the sample was $30 \pm 7\%$. Patients had been prescribed, on average, seven different medications. Twenty-one patients (67%) had been hospitalized at least once for decompensated heart failure in the previous 12 months. Systemic arterial hypertension and diabetes mellitus were present in 62.5% and 37.5% of the sample, respectively. The number of patients in functional classes I and II, who were totally asymptomatic or only displayed symptoms during intense physical effort, increased between the first (58%) and the third home visit (75%). These results, as well as further patient characterization data, are presented in table 1.

The 32 patients received a total of 96 home visits. Treatment adherence scores increased significantly between the first and third home visit. As observed in figure 1, these scores increased from 16.0 ± 2.6 in the first home visit to 20.4 ± 2.7 in the third visit ($p = 0.001$).

Treatment adherence improved significantly between the first and third visit, as observed in figure 2. In the first visit, patient scores on the adherence questionnaire ranged between 11 and 22, while in the third visit, the minimum score on the questionnaire was 15, and the maximum, 25. A total of 53.1% of patients reached the treatment adherence cutoff score of 18 in the first visit, while 81.3%

Table 1. Clinical and demographic characteristics of patients with heart failure

Characteristics	Media±dp	n(%)
Age (years)*	65 ± 16	
Gender (male) †		18(58)
Ethnicity (Caucasian)		21(71)
Years of education*	6 ± 3	
Work status (retired)		18(58)
Living with two or more family members		26(83)
Family income (minimum wages)*	3 ± 1	
Cause of heart failure		
Ischemia		12(37.5)
Hypertension		8(25)
Left ventricular ejection fraction*	30 ± 7	
Number of medications prescribed*	7 ± 2	
Previous hospitalizations		21(67)
Comorbidities		
Systemic arterial hypertension		20(62.5)
Diabetes mellitus		12(37.5)
Dyslipidemia		11(33.3)
Functional class I-II in home visit 1		18(58)
Functional class I-II in home visit 3		24(75)

*Continuous variables are expressed as mean ± standard deviation; n = 32

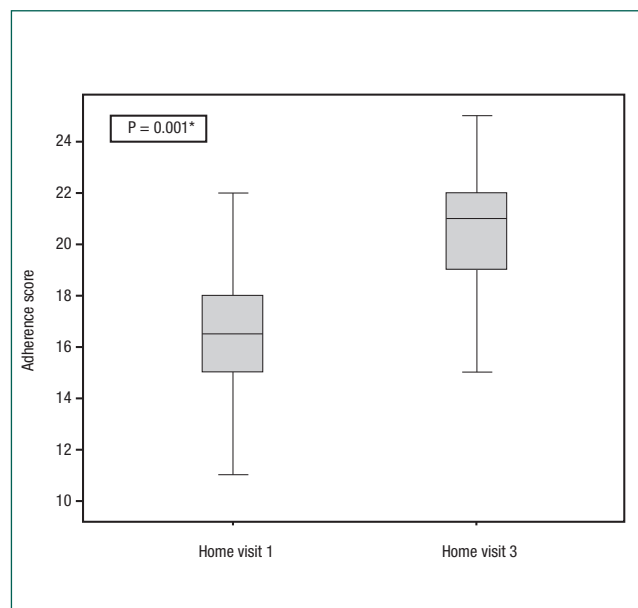


Figure 1. Comparison of treatment adherence scores over time in patients with heart failure; *Paired T-test

of patients obtained scores above the cutoff in the third visit. This difference was statistically significant at $p = 0.001$.

The items included in the treatment adherence questionnaire, as well as the scores obtained by patients on each of the items on the first and second visit, are described in table 2. No items were rated lower in the third visit as compared to the first. How-

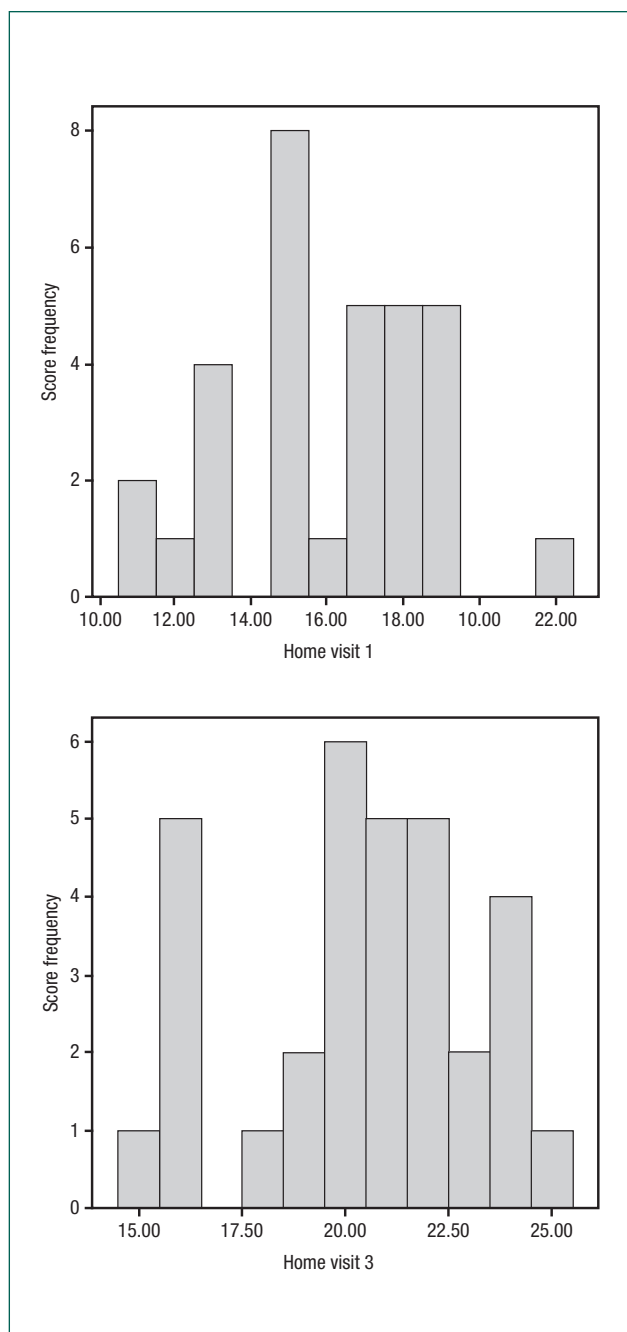


Figure 2. Comparison between treatment adherence scores in the first and third home visits; Chi-squared test

ever, several questions were given higher scores on the third visit, such as the use of medication prescribed, the control of dietary salt intake and the attendance of medical appointments and examinations. The greatest changes in adherence rates were observed in the items referring to daily weight monitoring, which was endorsed by no patients in the first visit and by 25% in the third visit, and dietary liquid intake.

Table 2. Percent treatment adherence according to mean patient scores on each item of a treatment adherence questionnaire administered on the first and third home visits

Questions	Visit 1 n(%)	Visit 3 n(%)
1. During the past 15 days, have you taken all your medications correctly, as prescribed by the doctor?	20(62.5)	22(68.8)
2. Do you check your weight everyday?	0	8(25)
3. Do you refrain from putting salt in your food?	31(96.9)	31(96.9)
4. Do you avoid adding spices, sauces and other salt-containing products to your food?	32(100)	32(100)
5. Do you avoid eating meals and consuming food outside your home, in places where salt restriction is not applied?	23(71.9)	24(75)
6. Do you ever consume soup, ice cream, gelatins, jam, juice, milk, tea, coffee, non-alcoholic beverages, etc. without considering the impact of these foods on your liquid intake?	5(15.6)	17(53.1)
7. Did you decrease liquid intake as per your doctor's or nurse's instructions?	13(40.6)	23(71.9)
8. Do you consume fruits rich in liquid, such as oranges, melons, watermelons, pineapples, coconut water, etc., without taking into account the amount of liquid consumed?	19(59.4)	27(84.4)
9. Do you abstain from alcohol?	27(84.4)	29(90.6)
10. Have you attended all your scheduled medical appointments and examinations?	26(81.3)	31(96.9)

Discussion

The results of this study indicated that the instructions provided by the nurses had a positive impact on treatment adherence. It was found that scores like daily weight monitoring and the control of dietary liquid intake displayed the greatest increase over the study. The lack of controlled liquid intake in patients with heart failure may lead to weight gain and, consequently, decompensation. Self-care behaviors such as daily weight monitoring and reductions in liquid intake tend to prevent the evolution of the condition. Interestingly, orientations regarding these two specific activities were the most closely followed by both patients. The functional class analysis revealed that the prevalence of patients in classes I and II increased significantly between the first and the third home visit, which suggest an overall improvement in patient clinical status.

Treatment adherence in patients with heart failure is an extremely relevant area of study. Individuals who take medication for chronic conditions have been found to have a generally poor understanding of their effects, which can affect treatment adherence and the safety of medication use.^(7,12) Treatment adherence is also known to be essential in avoiding episodes of decompensation. However, some patients still report significant difficulties in this area, so that the rates of readmission due to heart failure remain high.⁽⁴⁾ Studies have found that poor treatment adherence is among the main factors precipitating for decompensation and subsequent hospitalization.⁽⁵⁾

Risk factors for low treatment adherence include educational level and psychological disturbances, like depression,⁽¹³⁾ as well as features of the disease and the complexity of treatment itself.⁽¹⁴⁾ The cost of treatment, the dosage and effects of the medication required, the comorbidities presented by the patients, and the relationship between the individual and health care professionals may also influence treatment adherence.⁽¹¹⁾ In our study, each patient took four to ten different types of medication depending on the comorbidities present.

However, there does not appear to be sufficient evidence to support a profile of non-adherent patients. The results of a recent published systematic review showed that individuals with previous hospitalizations had higher adherence rates, probably because these patients had more severe symptoms, received more detailed instructions from health care professionals, and were more afraid of undergoing further decompensation episodes. The analysis of other predictors, such as socioeconomic status, comorbidities, and the type of medication prescribed, yielded inconsistent results. Patient educational level and the number of health professionals involved in each case were also found to have no predictive value on adherence rates. Due to a lack of evidence, the authors were unable to formulate recommendations for future interventions.⁽¹⁵⁾

Few studies have assessed the impact of home visits on treatment adherence in cases of heart failure, probably due to the scarcity of instruments available to assess this variable. The first study to assess the effect of multidisciplinary interventions in

patients with heart failure found that patient management by a specialized team who provided information regarding the disease, self-care and treatment adherence led to significant improvements in quality of life and treatment adherence.⁽¹⁶⁾

A randomized controlled trial published in 2012 also assessed the effect of a nursing intervention program involving meetings, telephone calls and home visits, on the self-care behaviors of patients with heart failure. A total of 66 patients were included in the study and followed for a period of nine months. Self-care behaviors increased by 66% in the intervention group and 26% in the control group. The statistical difference between these values ($p < 0.001$), suggested that educational interventions may have a substantial impact on the self-care behaviors of patients with heart failure.⁽⁸⁾

A pilot study published in 2010 aimed to develop, implement and test the efficacy of an intervention program based on nurse-led home visits. Twenty-four patients were included in the initial phase of the study. The intervention group presented significant improvements in quality of life as well as a reduction in depression symptoms, both of which were significantly more pronounced in these individuals than in the control group. The intervention group also had lower hospitalization rates, although these values did not differ significantly from the control group.⁽¹⁷⁾ The study concluded that home visits were effective strategies for increasing self-care and, consequently, treatment adherence, both of which contribute to reduced rehospitalization and mortality rates.

A recent systematic review showed that multidisciplinary interventions in patients with heart failure include appointments with doctors, nurses, nutritionists or social workers, as well as home visits, telephone monitoring, educational videos and interventions employed during the hospital stay itself. The review demonstrated that strategies involving multidisciplinary treatments reduce readmissions for decompensated heart failure as well as mortality rates, and that home-based interventions are the most effective.⁽¹⁾ Home visits may be especially effective due to their ability to foster autonomy and independence, especially in elderly patients, helping

to reduce anxiety and depression, as well as improving quality of life.⁽¹⁸⁾ Home visits also contributes to the interaction between nurses, family and patients, helping to establish a strong therapeutic alliance, which will probably result in improvements in self-care and self-efficacy of heart failure patients.⁽¹⁹⁾

It is known that heart failure is associated with a significant decrease in quality of life, and often leads to early retirement and high socioeconomic costs for health care systems. Since the prevention of decompensated heart failure is one of the greatest challenges for health care teams, it is important to dedicate resources to promote awareness of this condition.⁽¹¹⁾ The success of non-pharmacological treatments requires continuing and frequent efforts to maintain some proximity between the health care team, the patients and their caretakers, to ensure that the latter are aware of all orientations regarding the disease and self-care behaviors.⁽³⁾

A recent study showed that monitoring symptoms, specially weight and lower extremity edema, is the first step to perform appropriate self-care management, which could help heart failure patients to avoid re-hospitalizations.⁽²⁰⁾ That is the reason why multidisciplinary care for patients with heart failure should focus on factors which can aggravate the condition, patient reactions to physical effort, as well as the manifestation of signs and symptoms of decompensation. The success of interventions for patients with heart failure depends mainly on individuals' active participation and adherence to the treatment, as well as on the selection of an adequate therapeutic program by the health care team. Also, barriers to adherence should always be identified and overcome to ensure that the treatment is successful.⁽³⁾

Conclusion

The orientations provided by the nurses regarding pharmacological and non-pharmacological treatments led to increased treatment adherence, especially with regard to daily weight monitoring and restrictions on dietary liquid intake.

Acknowledgements

We would like to thank the *Fundo de Incentivo à Pesquisa do Hospital de Clínicas de Porto Alegre* and *Fundação de Amparo à Pesquisa do Estado do Rio Grande do Sul*, Brazil (*Pesquisa para o SUS-PPSUS-2008-2009*).

Collaborations

Mantovani VM; Ruschel KB; Souza EN; Mussi C and Rabelo ERS contributed to study design, data analysis and interpretation, manuscript writing and critical review, and to the final approval of the published version.

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