

Original Article

Effect of Beliefs about Patient Compliance on Hospital Readmissions and Self-care Behaviors in Patients with Heart Failure

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Abstract

Background: Heart failure is a clinical syndrome causing hospital readmissions, which results in labor force losses that impose burdens both for the patients and society. Patient compliance is a significant factor that affects self-care behaviors and hospital readmissions in patients with heart failure.

Aim: This research was carried out to examine how beliefs about patient compliance affect hospital readmissions and self-care behaviors in patients with heart failure.

Methods: This descriptive and cross-sectional study included 101 patients who visited the Cardiology Service between January 2020 and June 2020 to receive treatment. Number and percentage, mean and standard deviation were used in the data analysis and ANOVA, Pearson and Spearman coefficients, and multiple linear regression analysis were used.

Results: Belief scores about self-monitoring for the patients who had "at least 8" readmissions were lower ($F=5.033$ $p=0.00$). Multiple regression analysis found a significant relationship between patients' belief variables about self-monitoring (benefit-barrier) and their Self-Care Behavior scores, and these variables determined 34% of the Self-Care Behavior score ($R^2=0.34$, $p=0.00$).

Conclusions: The number of readmissions was higher in the patients who perceived self-monitoring as less beneficial, and the individuals who are non-compliant are insufficient to apply appropriate self-care behaviors.

Keywords: patient compliance, nursing, heart failure, self-care behaviors, hospital readmission.

Introduction

Heart failure is defined as a syndrome that prevents the heart from providing sufficient oxygen to meet the metabolic needs of tissues despite normal levels of filling pressure. It leads to cardiac structural or functional disorders (Dickstein et al., 2008). Heart failure is an important health problem that affects both individuals and society as it is frequently observed, it has an increasing number of patients year by year, and it has high morbidity and mortality rates (Mert & Barutcu, 2012). More than 7 million people die every year in the world due to coronary heart disease, which accounts for 12.8% of all causes of death (WHO, 2015). According to the Heart Failure Prevalence and Predictors in the Turkey HAPPY study, the prevalence of heart

failure in Turkey is 6.9% and approximately 2,000,424 adults have heart failure in Turkey (Degertekin et al., 2012).

Hospitalization rates due to heart failure have increased by three times over the last 30 years. More than 80% of patients with heart failure are above the age of 65. Data indicate that after their first hospitalization due to heart failure, 25% of the patients are readmitted within 30 days and 50% within six months (Dharmarajan & Rich, 2017; Koseoglu & Enc, 2016). Heart failure is a clinical syndrome causing hospital readmissions, which results in labor force losses that impose burdens both for the patients and society (Akbiyik & Enc, 2016). Patient compliance is a significant factor that affects self-care behaviors and hospital readmissions in patients with heart failure.

Compliance is expressed as “a reaction that a person exhibits against the demands arisen from self, others, or the environment.” (Gençöz, 1998). Making lifestyle changes such as compliance to the medication and diet, recognizing the symptoms, physical activity, and resting indicates the compliance of individuals who are diagnosed with heart failure (Beswick et al., 2005; Kep et al., 2013; Uzun, 2007) Lainscak et al. (2011) indicates that 15% to 60% of hospitalizations are due to the patients’ non-compliance to the medication, diet, and symptom monitoring (Lainscak et al., 2011). A patient’s ability to properly modify their behaviors to manage this disease is an indicator of self-care. Self-care and patient compliance are concepts that interact with each other.

Self-care was defined by Orem in 2001 as “the actions carried out by a person himself to be able to sustain his own life, health, and general well-being” (Orem, 2001). The first way to be able to manage heart failure is based on self-care. Poor life quality and self-care increase hospital readmissions and result in early death, while individuals who provide sufficient self-care have better living conditions, their hospital readmission rate is lower, and they have higher survival rates (Akbiyik & Enc, 2016). The symptoms patients with heart failure experience cause hospital readmissions, therefore disease control and the development of the patient’s ability to manage symptoms are necessary (Lainscak et al., 2011; Uysal & Enc, 2012).

A person who is diagnosed with heart failure aims to change the course of the disease by learning how to cope with this situation starting from the moment of diagnosis and by trying to provide effective self-care. The compliance of the patients diagnosed with heart failure to the disease significantly affects hospital readmissions, which creates changes in the concept of self-care. There have been several studies in the literature regarding heart failure, self-care, and patient compliance, but no previous study was found in the literature examining the effect of the patient compliance beliefs of those diagnosed with heart failure on hospital readmission and self-care behaviors. In light of this information, this research aimed to examine the effect of the beliefs about patient compliance on hospital readmission and self-care behaviors in the patients with heart failure.

Methodology

Design and Study Population: This is a descriptive and cross-sectional study. The research was carried out in the Cardiology Service of the Kutahya Tavsanlı Doc. Dr. Mustafa Kalemli State Hospital between January 2020 and June 2020. The research universe consisted of the patients who were diagnosed with heart disease and applied to the Cardiology Service of the Kutahya Tavsanlı Doc. Dr. Mustafa Kalemli State Hospital to receive treatment. The research sample was the patients who were diagnosed with heart disease and applied to the Cardiology Service of the Kutahya Tavsanlı Doc. Dr. Mustafa Kalemli State Hospital to receive treatment and who met the research inclusion criteria. The sample size was not calculated and the total universe was included in the research. The inclusion criteria were as follows: (1) being diagnosed with heart failure at least six months ago, (2) being older than 18 years old, and (3) agreeing to participate in the research. The exclusion criteria were as follows: (1) diagnosed with a psychiatric disorder.

Measurements

Patient Information Form: This was an information form prepared by the researcher based on the literature and included demographic characteristics of the patients and information regarding the disease (Akbiyik & Enc, 2016; Koseoglu & Enc 2016; Lainscak et al., 2011).

Beliefs about Medication Compliance Scale (BMCS): This is a five-point Likert-type scale and measures the beliefs that the individual has about medication compliance. The scale was developed by Bennett et al. at Indiana University School of Nursing in the USA in 2000 (Bennett et al., 1997; Bennett et al., 2000). This 12-item scale has benefit and barrier subscales; the items 1, 2, 7, 10, and 11 measure the individual’s perception of benefits and the items 3, 4, 5, 6, 8, 9, and 12 measure the individual’s perception of barriers. The score on the Benefits subscale varies between 6 and 30 and the higher the score, the greater the perceived benefits. The higher the score on the Barriers subscale, the higher the perceived barriers. The Turkish validity and reliability study of the scale was conducted by Oguz et al. (2010) and the Cronbach’s alpha coefficients were 0.74 and 0.59, respectively (Oguz et al., 2010).

Beliefs about Dietary Compliance Scale (BDCS):

This is a five-point Likert-type scale and consists of 12 items. It has benefit and barrier subscales. The first subscale measures the benefit perception of the person (items 1-5, 11, and 12) and the second subscale measures the perception of the barriers (items 6-10). The benefit subscale shows higher perceived benefit with higher scores. The second item of the scale is reverse coded. The Turkish validity and reliability of the scale was conducted by Oguz et al. (2010) and the Cronbach alpha coefficients were 0.71 and 0.58, respectively (Oguz et al., 2010).

Beliefs about Self-Monitoring Scale (BSMS):

This is a five-point Likert-type scale that consists of 18 items. It has benefit and barrier subscales. A higher score on the benefit subscale (items 3, 5, 11, and 15-17) indicates that the perceived benefit of a behavior is greater; and a higher score on the barrier subscale (items 1, 2, 4, 6-10, 12-14, and 18) indicates that the subject perceives more of the barriers when performing a behavior. The Turkish validity and reliability of the scale was conducted by Oğuz et al. (2010) and the Cronbach alpha coefficients were 0.77 and 0.68, respectively (Oguz et al., 2010).

European Heart Failure Self-care Behavior Scale – 12:

This scale was developed by Jaarasma et al. (2003) to measure self-care behaviors in individuals with heart failure (Jaarasma et al., 2003). The Turkish validity and reliability of the scale was conducted by Baydemir et al. (2013), and the Cronbach's alpha coefficient was 0.69 (Baydemir et al., 2013). The scale consists of 12 questions that measure self-care activities, and a Likert-type scale (1-5 points) was used to score the scale. The total scale score ranges between 12 and 60, and a score of 12-36 indicates good health care while 37-60 indicates insufficient self-care (Baydemir et al., 2013).

Data collection: The Patient Information Form, BMCS, BDCS, BSMS, and the European Heart Failure Self-care Behavior Scale – 12 were administered to the patients who were diagnosed with heart failure. Data were collected using the face-to-face interview method.

Ethical considerations: In addition to the permission from Kutahya Tavsanlı Assoc. Dr. Mustafa Kalemli State Hospital, Department of Cardiology, ethics committee approval was obtained from the Clinic Research Ethics Committee of Kutahya Health Sciences University (Decision No: 2019/12-3). The patients who met the inclusion criteria were informed about the purpose of the study verbally and in writing, and written consent was obtained from those who agreed to participate.

Data analysis: Data obtained from the research were analyzed using the Statistical Package for Social Science (SPSS) 22.0 software. To analyze the data, numbers and percentages, mean and standard deviation, and one-way analysis of variance (ANOVA) were used. Pearson and Spearman coefficients were used to describe the relationship between patient compliance beliefs and self-care behaviors. In addition, multiple linear regression analysis was conducted to determine the effect of the beliefs about patient compliance on self-care behaviors.

Results

The distribution of participants' sociodemographic characteristics is presented in Table 1. The participants' mean age was 68.45 and more than half were female (54.5%) and single (67.3%). While the education status of the majority of patients was primary school (60.4%), their economic status was reported as income equal to expenses (68.3%) for the majority of the participants. According to the NYHA heart classification, 31.72% were determined as Class IV. Calculating the body mass index (BMI), 37.6% of the participants were overweight ($25.0 \leq \text{BMI} < 29.9$).

The majority of the participants were diagnosed at least 25 months ago (65.3%), 37.6% were hospitalized "2-4 times," and the majority of these hospital readmissions (43.6%) were between 0-6 months after the initial diagnosis (Table 1).

Table 1. Demographic and disease characteristics of the study participants (N=101)

Variable		N(%)
Gender	Female	55(54.5)
	Male	46(45.5)
Age* (Mean ± SD)		68.45±12.24
Marital Status	Married	33(32.7)

	Single	68(67.3)
Education Level	Illiterate	22(21.8)
	Primary school	61(60.4)
	Secondary school	18(17.8)
Presence of any employment	Yes	22(21.8)
	No	79(78.2)
Economic Status	Income lower than expenses	26(25.7)
	Income equal to expenses	69(68.3)
	Income higher than expenses	6(5.9)
Heart failure classification according to physical activity (NYHA)	NYHA I	27(26.7)
	NYHA II	17(16.8)
	NYHA III	25(24.8)
	NYHA IV	32(31.7)
Body mass index (BMI)	Underweight	7(6.9)
	Normal	27(26.7)
	Overweight	38(37.6)
	Obese	26(25.7)
	Morbidly obese	3(3.0)
Duration of diagnosis	6-12 months	22(21.8)
	13-24 months	13(12.9)
	At least 25 months	66(65.3)
Number of Hospitalizations	2-4 times	38(37.6)
	5-7 times	36(35.6)
	At least 8 times	27(26.7)
Time from discharge to readmission	0-6 months	44(43.6)
	7-12 months	25(24.8)
	At least 13 months	32(31.7)

* Data are expressed as Mean \pm Standard deviation.

Examining the participants' beliefs about compliance to medication, compliance to diet, and self-monitoring, belief scores about self-monitoring for the patients whose number of hospital readmissions was "at least 8" were lower, and they perceived self-monitoring as less beneficial than the other patients ($F= 5.033$ $p= 0.00$). Comparing the number of hospitalizations

and the scores of beliefs about compliance to medication and diet, no significant difference was found. No significant difference was found when time from discharge to hospital readmission and scores of beliefs about compliance to medication, diet, and self-monitoring were compared (Table 2).

Table 2. Comparison of patient compliance with the number of hospitalizations and time until hospital readmission

	Compliance to Medication		Compliance to Diet		Self-Monitoring	
	Benefit	Barrier	Benefit	Barrier	Benefit	Barrier
	$M\pm SD$	$M\pm SD$	$M\pm SD$	$M\pm SD$	$M\pm SD$	$M\pm SD$
Number of Hospitalizations						
2-4 times	21.16 \pm 2.64	18.68 \pm 4.32	23.89 \pm 4.50	13.66 \pm 3.54	16.50 \pm 3.38	38.61 \pm 7.49
5-7 times	20.17 \pm 4.51	19.50 \pm 5.10	23.72 \pm 5.69	13.53 \pm 3.75	17.59 \pm 4.10	38.50 \pm 7.84
At least 8 times	19.33 \pm 3.62	19.59 \pm 3.57	22.00 \pm 4.73	15.07 \pm 3.26	14.30 \pm 3.51	40.93 \pm 8.17

	$F= 2.016$ $p= 0.14$	$F= 0.444$ $p= 0.64$	$F= 1.300$ $p= 0.28$	$F= 1.736$ $p= 0.18$	$F= 5.033$ $p= 0.00^*$	$F= 0.916$ $p= 0.40$
Time from discharge to readmission						
0-6 months	19.30±3.99	19.95±4.75	22.59±4.80	13.80±4.03	16.61±4.47	39.59±7.22
7-12 months	20.96±3.89	18.72±4.00	23.20±5.63	13.48±3.66	16.00±3.43	39.32±10.38
At least 13 months	21.22±2.72	18.59±4.21	24.43±4.80	13.66±2.73	15.66±3.16	38.53±6.30
	$F= 3.151$ $p= 0.05$	$F= 1.094$ $p= 0.34$	$F= 1.266$ $p= 0.29$	$F= 0.875$ $p= 0.42$	$F= 0.602$ $p= 0.55$	$F= 0.173$ $p= 0.84$

* $p < 0.01$

Examining the correlation between the scores of the compliance belief scales of patients and the Self-Care Behavior scale, a negative significant relationship was found with the subscales of compliance to medication-benefit, compliance to diet-benefit, and self-

monitoring-benefit while a positive significant relationship was found between the subscales of compliance to medication-barrier, compliance to diet-barrier, and self-monitoring-barrier ($p < 0.01$) (Table 3).

Table 3. Correlation of patient compliance and Self-Care Behavior scale

Scale	$M \pm SD$	1	2	3	4	5	6	7
1. Compliance to medication-benefit	20.31±3.69	-						
2. Compliance to medication-barrier	19.22±4.41	-0.523**	-					
3. Compliance to diet-benefit	23.32±5.03	0.696**	-0.546**	-				
4. Compliance to diet-barrier	13.99±3.57	-0.123	0.431**	-0.344**	-			
5. Self-Monitoring-benefit	16.15±3.83	0.350**	-0.382**	0.534**	-0.406**	-		
6. Self-Monitoring-barrier	39.18±7.79	-0.305**	0.453**	-0.530**	0.386**	-0.570**	-	
7. Self-care Behavior Scale Total	33.46±6.78	-0.261**	0.346**	-0.425**	0.338**	-0.513**	0.498**	-

**Correlation is significant at the 0.01 level.

Multiple regression analysis showed a significant relationship between patients' belief variables

about self-monitoring (benefit-barrier) and their Self-Care Behavior scores, and these variables determined 34% of the Self-Care Behavior score ($R^2 = 0.34$, $p = 0.00$) (Table 4).

Table 4. Regression analyses of patient compliance on self-care behavior

	Self-care Behavior Scale Total			
	R	R^2	F	p
	0.59	0.34	8.22	0.00
	B	β	t	p
Compliance to medication-benefit	0.04	0.02	0.18	0.87

Compliance to medication-barrier	0.08	0.05	0.45	0.66
Compliance to diet-benefit	-0.16	-0.12	-0.83	0.41
Compliance to diet-barrier	0.15	0.08	0.77	0.45
Self-Monitoring-benefit	-0.49	-0.28	-2.50	0.01*
Self-Monitoring-barrier	0.20	0.23	2.10	0.04*

* $p < 0.05$

Discussion

This study examined the effect of patient compliance on hospital readmissions and self-care behaviors in patients with heart failure. Patient compliance is important to promote self-care behaviors and to prevent/reduce hospital readmissions. This research indicated that patient compliance beliefs affected hospital readmissions and self-care behaviors in the patients with heart failure. Patients with “at least 8” hospital readmissions perceived self-monitoring as less beneficial than the other patients. In addition, although no significant difference was found between the scores of compliance to medication-benefit and compliance to diet-benefit, the time from discharge to hospital readmission was shorter (0-6 months) in the patients with lower compliance to medication-benefit and compliance to diet-benefit scores.

In similar studies, evidence suggests that self-monitoring and patient compliance are effective tools against hospital readmission (Jankowska-Polańska et al., 2020; Lainscak et al., 2011). In Lainscak et al. (2011)’s study, it was stated that 15% to 60% of hospitalizations are due to patients’ non-compliance to medication treatment, diet, and symptom monitoring. In another study conducted by Jankowska-Polańska et al. (2020), it was determined that patients are unable to comply with daily weight follow-up and exercising, which affects the number of hospital readmissions (Jankowska-Polańska et al., 2020). Similar results were obtained in the study carried out by Nieuwenhuis et al. (2012). These results highlight the necessity of applying nursing interventions and training programs to increase patient compliance in patients with heart failure.

In the research, a significant relationship was found when the correlation between the scores of the patient compliance belief scales and the Self-Care Behavior scale was examined. In addition, the patients’ belief variables about self-monitoring (benefit-barrier) determined 34% of the Self-Care

Behavior score. This result confirms that individuals whose patient compliance cannot be provided are insufficient to apply appropriate self-care behaviors. In Akbıyık & Enç (2016)’s study, patients with chronic heart failure exhibited insufficient self-care behaviors regarding medication use, weight-liquid monitorization, and diet and activity-resting (Akbıyık & Enç, 2016). In heart failure management, the studies conducted emphasize that patients should actively participate in the disease process, and healthcare professionals should determine common goals by cooperating with the patient (Karmali et al., 2014; Kep et al., 2013). In patients with heart failure, nursing care aims to develop the self-care ability of the patients, and individualized self-care education is the most important factor. Self-care is an important element in the successful management of heart failure, and self-care is the core of the nursing philosophy for nurses (Conceição et al., 2015).

Self-care education is the most effective way to promote patient compliance and increase self-care behaviors, but continuous individualized self-care education is not applied in Turkey. Patients diagnosed with heart failure should be continuously and carefully monitored in terms of their symptoms, treatment, and management. Hospital readmission increases when the individual diagnosed with heart failure does not comply with the disease management practices (Arredondo Holguín et al., 2012; Rodríguez-Gazquez et al., 2012). Therefore, nurses have a huge role to develop compliance and self-care behaviors in patients. Nursing care and continuous individualized self-care education will reduce hospital readmissions and increase self-care behaviors of the patients.

Limitations: One of the limitations of the study is that the data were collected based on patients’ self-reports. In addition, as the data were obtained mostly from elderly individuals, one center, and a small number of patients due to the pandemic, the generalization of the study might be limited.

Conclusion: To conclude, the number of hospital readmissions was higher in the patients who perceived self-monitoring as less beneficial, and the individuals whose patient compliance cannot be provided were insufficient to apply appropriate self-care behaviors. Heart failure is mostly observed in the elderly patient group, and therefore the research mostly consists of the elderly population. It can be suggested to conduct further studies focusing on a younger patient group, compare the compliance and self-care behaviors in younger and elderly patients, and include a greater number of patients. In addition, it is recommended to apply nurse-coordinated individualized education programs in order to increase patient compliance and self-care behaviors and reduce hospital readmissions in patients with heart failure.

Ethical Approval: In addition to the permission from Kütahya Tavşanlı Assoc. Dr. Mustafa Kalemli State Hospital, Department of Cardiology, ethics committee approval was obtained from the Clinic Research Ethics Committee of Kütahya Health Sciences University (Decision No: 2019/12-3). The patients who met the inclusion criteria were informed about the purpose of the study verbally and in writing, and written consent was obtained from those who agreed to participate.

This study was conducted in accordance with the principles of the Declaration of Helsinki.

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