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Research Article

Effect of Medication and Dietary Compliance on Rehospitalization and the Quality of Life of Patients with Heart Failure

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ABSTRACT

Aim: The aim of this study was to determine the effect of medication and dietary compliance on rehospitalization and quality of life of patients with heart failure (HF).

Method: This descriptive correlational study comprised 170 patients with HF. The Patient Identification Questionnaire, Beliefs about Dietary Compliance Scale, Beliefs about Medication Compliance Scale, and Minnesota Living with Heart Failure Questionnaire were used to collect data. Numbers, percentages, mean, independent t-test, analysis of variance, and Pearson correlation analysis were used in the evaluation of the data.

Results: The benefit perception scores of patients in the medication and dietary compliance were at a higher level, and the quality of life total score was at a moderate level. As the number of hospitalizations increased, the quality of life decreased. In addition, medication and dietary compliance affected the rehospitalization and quality of life.

Conclusion: On the basis of the obtained results, this study recommended to impart training to the patients by the nurses about medication and dietary compliance and also to increase the counseling programs.

Keywords: Compliance, heart failure, quality of life, rehospitalization

INTRODUCTION

Heart failure (HF) is an important health issue with high mortality and morbidity rates (Dilokthornsakul, Chaiyakunapruk, Nimpitakpong, Jeanpeerapong, & Sruamsiri, 2012; Rich, 2011; Srisuk, Cameron, Ski, & Thompson, 2016). Despite pharmacological and technological advancements in health, HF continues to be the most common reason for admission and rehospitalizations (Blecker, Zhang, Ford, Steinwachs, & Daumit, 2010; DiNicolantonio, Chatterjee, & O'Keefe, 2016; Enç & Öz-Alkan, 2012; Scherbakov, Haeusler, & Doehner, 2015). Additionally, health expenses have also increased as a result of this increased hospitalization (Badır, 2012).

The number of patients with HF worldwide is approximately 23 million. In the United States, about 5.7 million people have HF, and 550,000 patients are diagnosed with HF every year (Dilokthornsakul et al., 2012; McClintock, Mose, & Smith, 2014). The prevalence of HF has been found to be 2.9% in Turkey (Dickstein, Cohen-Solal, Filippatos, McMurray, Ponikowski, Poole-Wilson, et al., 2008).

Treatment of HF involves pharmacological and nonpharmacological approaches (Doukky, Avery, Mangla, Collado, Ibrahim, Poulin, et al., 2016). Compliance with pharmacological and nonpharmacological treatment is extremely important in patients with HF as in other chronic diseases (Dickstein et al., 2008; Krueger, Botermann, Schorr, Griese-Mammen, Laufs, & Schulz, 2015). Previous studies determined that the mortality rates within 1 year in the patients who adhered to the pharmacological treatment were significantly low, and their hospitalizations decreased (Fitzgerald, Powers, Ho, Maddox, Peterson, & Allen, 2011; Krueger et al., 2015; Murphy, McAlister, & Eurich, 2015). Noncompliance with the treatment causes a decreased quality of life by worsening the symptoms of the patients (Krueger et al., 2015; Udelson, Pressler, Sackner-Bernstein, Massaro, Ordronneau, Lukas,

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et al., 2009; Uysal & Enç, 2012). Additionally, compliance with treatment in patients with HF constitutes an important step to self-care. The individual is expected to comply with his/her daily treatment. In a study conducted using the current data, people with high self-care also have a high quality of life, which also reduced their hospitalization rates Buck, Dickson, Fida, Riegel, D'Agostino, Alvaro, et al., 2015).

Pharmacological and nonpharmacological treatments such as dietary compliances are crucial for patients with HF (Doukky et al., 2016; Meseri, 2014). Numerous studies exist indicating that the symptoms of patients with HF reduce with reduced dietary sodium (Colin-Ramirez, McAlister, Zheng, Sharma, & Ezekowitz, 2016; Jurgens, Goodlin, Dolansky, Ahmed, Fonarow, Boxer, et al., 2015; Rifai & Silver, 2016). Dietary compliance should be considered as an important goal in the management of HF (Uysal & Enç, 2012; van der Wal, Jaarsma, Moser, van Gilst, & van Veldhuisen, 2007), because numerous studies have revealed that noncompliance with the dietary recommendations increases rehospitalizations (Doukky et al., 2016; Heo, Lennie, Pressler, Dunbar, Chung, & Moser, 2015; Lennie et al., 2011; Son, Lee, & Song, 2011). If behavioral factors such as noncompliance with medication and diet, which cause exacerbation of HF, can be overcome, hospitalization of the individuals can be prevented (Murphy et al., 2015).

Patients can experience physical and psychological problems related to the ineffective management of their new forms of life. These problems affect the quality of lives of individuals negatively (Fitzgerald et al., 2011). Especially, the lifestyle changes required by the disease are extremely important. The quality of life of patients with HF who comply with the lifestyle changes such as medication and diet programs are expected to be positively affected (Wu, Lennie, Chung, Dekker, Biddle, Moser, et al. 2012). The results of some studies have revealed that the patients who adapt to the medication and dietary programs also have a higher quality of life (Krueger et al., 2015; Meseri, 2014; Sezgin, & Mert, 2015).

Individuals should work with a multidisciplinary team to increase their compliance with the disease processes (Frankenstein, Fröhlich, & Cleland, 2015; Sato, 2015; Uzun, 2014). The most important task in this process falls on the nurses. The care programs in the leadership of nurses are expected to contribute positively to the process experienced by patients with HF. They are the nurses who advise patients on the compliance with the medications and diet prepared appropriately for their disease (Enç, Yiğit, Altıok, Özer, & Oğuz, 2007). Informing patients about their conditions, performing treatment and interventions to improve their beliefs, and monitoring compliance with the treatment are among the important duties of nurses. Team work in the leadership of nurses is seen to decrease mortality and morbidity (Frankenstein et al., 2015; Kim & Han, 2013).

Although numerous studies are available on HF in Turkey, no study has examined the effect of medication and dietary compliance of patients with HF on rehospitalization and quality of life. This study aimed to fulfill the deficiency in this area and guide training programs given by the nurses to the patients with HF.

Research Questions

1. What are the compliance levels of HF patients with medication and diet?
2. What is the frequency of hospitalization and level of quality of life of HF patients?
3. Does compliance with medication and diet of HF patients have an impact on rehospitalization?
4. Does compliance with medication and diet of HF patients have an impact on quality of life?

METHOD

Study Design

The study was conducted in a descriptive correlational design.

Sample

The population of the study consisted of 379 adult patients who were hospitalized at a university hospital were diagnosed with HF at least 6 months ago and had previously been hospitalized at least once. The sample consisted of 161 patients determined by calculating with sampling method with the known population. However, the study was completed with 170 patients to reduce the error margin.

Data Collection

The data were collected from December 2015 to April 2016. Patient Identification Questionnaire, Beliefs about Dietary Compliance Scale (BDCS), Beliefs about Medication Scale (BMCS), and Minnesota Living with Heart Failure Questionnaire (MLHFQ) were

used to collect the data of the study. A researcher collected the data using a face-to-face interview method by providing a quiet environment in the patient's room. The interview lasted for approximately 10-15 minutes for each patient.

Patient Identification Questionnaire: The questionnaire prepared by the researcher involved 12 questions on the sociodemographic characteristics of the patient and the health-disease characteristics.

Beliefs about Dietary Compliance Scale (BDCS): The BDCS was developed by Bennett et al. in 2001. The validity and reliability study of the scale in Turkey was performed by Oğuz, Enç, & Yiğit in 2010. The scale is a 5-point Likert type having two subscales, including benefit perception (items 1-5, 11, 12) and barrier perception (items 6-10). The total highest score of the scale is 60, and the lowest score is 12. The high score in the benefit subscale signifies that benefits are perceived more with the displaying behavior. A high score in the barrier subscale signifies that the person perceives barriers more while displaying a behavior. Cronbach's alpha values were determined as 0.71 for the benefit subscale and 0.58 for the barrier subscale (Oğuz, Enç, & Yiğit, 2010).

In this study, Cronbach's alpha values were determined as 0.75 for the benefit subscale and 0.43 for the barrier subscale.

Beliefs about Medication Scale (BMCS): The BMCS was developed by Bennett et al. in 2000. The validity and reliability study of the scale in Turkey was conducted by Oğuz, Enç, & Yiğit in 2010. The scale is a 5-point Likert type. Items 1, 2, 7, 9, 10, and 11 of the scale belong to the benefit perception subscale, whereas items 3, 4, 5, 6, 8, and 12 belong to the barrier perception subscale. The total highest score from the scale is 60 and the lowest 12. High score in the benefit subscale signifies that benefits are perceived more with the displaying behavior. The high score in the barrier subscale signifies that the person perceives barriers more while displaying a behavior. The Cronbach's alpha values were calculated as 0.74 for the benefit subscale and 0.59 for the barrier subscale (Oğuz, Enç, & Yiğit, 2010).

In this study, the Cronbach's alpha values were calculated as 0.80 for the benefit subscale and 0.62 for the barrier subscale.

Minnesota Living with Heart Failure Questionnaire (MLHFQ): The MLHFQ was developed by Rector, Kubo & Cohn in 1987. The Turkish validity and reliability study of the scale was conducted by Aşık-Özdemir in 2009. The scale is 6-point Likert type and consists of 21 items examining 2 subscales of "physical function" and "emotional dimension." Although eight of the questions (2-7, 12, and 13) are involved in the physical function dimension, five of them (17-21) are involved in the emotional dimension. The total score of the answers varies between 0 and 105. The Cronbach's alpha values of the scale are more than 0.70 for two subscales of the scale and the overall scale. The low score on the scale indicates low dysfunction, signifying the high quality of life (Demir & Özer, 2014).

In this study, Cronbach's alpha values were found as 0.88 for the physical subscale, 0.86 for the emotional subscale, and 0.90 for the overall scale.

Data Analysis

The data obtained from the study were evaluated using the statistical program. Number, percentage, and mean analyses from descriptive statistics were used in the statistical analysis of the data. Correlation analysis was used to determine the correlation between the scores of the scales. Independent-samples *t*-test, Mann-Whitney U test, analysis of variance, and Kruskal-Wallis analysis were used to compare the total and subscale mean scores of the scales used with the sociodemographic characteristics and disease status. The level of significance was accepted as $p<0.05$.

Ethical Considerations

Before starting the study, written permission from the related department of Inönü University hospital and the ethical approval (December 1, 2015, and approval no: 2015/10-6) were taken from Health Sciences Scientific Research and Publication Ethics Board of Inönü University. This study was completed in accordance with the principles determined in the Declaration of Helsinki.

RESULTS

Demographics

Of the subjects, 51.2% of the patients having an age average of 67.92±11.24 years were female, 74.1% were married, 47.6% were illiterate, 50.6% were unemployed, and 53.5% had moderate income level.

Additionally, 54.1% had class II New York Heart Association, 50% were overweight, 72.4% had a disease duration of 25 months and more, 64.1% were hospitalized two to four times, and the time passed from the previous hospitalization was more than 6 months in 60% of them (Table 1).

Table 1. Sociodemographic and medical properties of the patients (n=170)

Sociodemographic properties		n	%
Age	**Mean±SD**		
	67.92±11.24		
Gender	Female	87	51.2
	Male	83	48.8
Marital status	Married	126	74.1
	Single	44	25.9
Education	Illiterate	81	47.6
	Primary school	71	41.8
	High school and more	18	10.6
Employment status	Working	84	49.4
	Unemployed	86	50.6
Income	Poor	31	18.2
	Moderate	91	53.5
	Good	48	28.3
Medical properties			
NYHA class	II	92	54.1
	III	78	45.9
Body mass index	Normal	50	29.4
	Overweight	85	50.0
	Obese	35	20.6
Duration of illness	6-12 month	31	18.2
	13-24 month	16	9.4
	25 month and more	123	72.4
Number of hospitalizations	2-4	109	64.2
	5-7	30	17.6
	8 and more	31	18.2
Previous hospitalization time	0-6 months ago	102	60.0
	7-12 months ago	40	23.5
	13 months and more	28	16.5

NYHA: New York Heart Association; SD: Standard Deviation

Mean Scores of BDCS, BMCS, and MLHFQ

The patients included in the study had a score of 21.60±4.33 on the benefit subscale and 11.18±3.53 on the barrier subscale of the BDCS. The patients had a score of 21.70±3.67 on the benefit subscale and 18.43±3.90 on the barrier subscale of the BMCS. They had a score of 30.18±5.85 on the physical subscale, 9.19±6.35 on the emotional subscale, and a total score of 58.05±15.62 of the MLHFQ (Table 2).

BDCS, BMCS, and MLHFQ Scores with Rehospitalization Rates

The difference between the groups in the benefit subscale was found to be statistically significant compared with the mean scores that the patients obtained from BDCS benefit and barrier subscales according to the number of hospitalizations ($p<0.05$). The difference between the groups in the benefit subscale was found to be statisti-

Table 2. Means scores of BDCS, BMCS, and MLHFQ (n=170)

	Score that can be taken from the scale		Score of patients on the scale		
Scales	**Min**	**Max**	**Min**	**Max**	**Mean±SD**
BDCS					
Benefits subscale	7	35	11	35	21.60±4.33
Barriers subscale	5	25	5	28	11.18±3.53
BMCS					
Benefits subscale	6	30	6	30	21.70±3.67
Barriers subscale	6	30	8	27	18.43±3.90
MLHFQ					
Physical function subscale	0	40	11	39	30.18±5.85
Emotional subscale	0	25	0	24	9.19±6.35
Overall scale	0	105	19	95	58.05±15.62

BDCS: Beliefs about dietary compliance scale; BMCS: Beliefs about medication compliance scale; MLHFQ: Minnesota living with heart failure questionnaire; SD: Standard deviation

cally significant (p<0.05) compared with the mean scores of the patients from BMCS benefit and barrier subscales according to the number of hospitalizations. Comparing the patients' MLHFQ total scores and physical and emotional subscale mean scores according to the number of hospitalizations, the difference between the groups was found to be statistically significant (p<0.05, p<0.01). As the number of hospitalizations increased, the mean scores increased, indicating that the quality of life decreased with the increase in the number of hospitalizations (Table 3).

Table 3. Comparison of the BDCS, BMCS, and MLHFQ scores with rehospitalization rates (n=170)

	Number of Hospitalizations				
	2-4 Mean±SD	5-7 Mean±SD	Above 8 Mean±SD	F	p
BDCS					
Benefits subscale	21.85±4.08	22.70±5.25	19.67±3.73	4.361	0.014*
Barriers subscale	11.18±3.62	10.93±3.43	11.45±3.38	0.542	0.850
BMCS					
Benefits subscale	22.00±3.30	22.36±3.98	20.00±4.20	4.361	0.014*
Barriers subscale	17.99±3.79	17.20±4.13	19.80±3.67	2.711	0.069
MLHFQ					
Physical function	29.43±6.00	30.53±6.46	32.51±3.90	3.51	0.032*
Emotional subscale	8.62±6.30	8.63±6.23	11.74±6.20	3.126	0.046*
Overall scale	55.64±15.99	57.96±14.40	66.61±12.57	6.321	0.002**

*p<0.05, ** p< 0.01, *** p<0.001, F: Analysis of variance test
BDCS: Beliefs about dietary compliance scale; BMCS: Beliefs about medication compliance scale; MLHFQ: Minnesota living with heart failure questionnaire; SD: Standard deviation

Table 4. The comparison of previous hospitalization time of the patients and their scores of BDCS, BMCS, and MLHFQ scales point averages (n=170)

	Previous Hospitalization Time				
	0-6 month ago Mean±SD	7-12 month ago Mean±SD	13 month ↑ Mean±SD	F	p
BDCS					
Benefits subscale	21.44±4.19	21.77±4.15	21.96±5.17	0.198	0.821
Barriers subscale	11.38±3.76	11.10±3.42	10.60±2.79	0.162	0.583
BMCS					
Benefits subscale	21.32±3.38	22.47±3.22	22.00±5.01	1.527	0.220
Barriers subscale	18.93±3.56	18.63±4.30	18.39±4.45	2.891	0.058
MLHFQ					
Physical function	31.47±5.02	28.60±6.24	27.78±6.96	6.690	0.002**
Emotional subscale	10.49±6.45	7.70±5.31	6.60±6.27	5.870	0.003**
Overall scale	62.25±14.83	53.00±13.87	49.96±15.97	10.609	0.000***

*p<0.05, **p<0.01, *** p<0.001, F: Analysis of variance test
BDCS: Beliefs about dietary compliance scale; BMCS: Beliefs about medication compliance scale; MLHFQ: Minnesota living with heart failure questionnaire; SD: Standard deviation

Table 5. The correlation between BDCS, BMCS, and MLHFQ (N=170)

	MLHFQ	Physical function	Emotional subscale	Overall scale
BDCS	r	r	r	
Benefits subscale	−0.108	−0.062	−0.078	
Barriers subscale	0.075	0.137	0.148	
BMCS				
Benefits subscale	−0.260**	−0.257**	−0.280***	
Barriers subscale	0.264**	0.338***	0.308***	

*p<0.05, **p<0.01, ***p<0.001, r: correlation
BDCS: Beliefs about dietary compliance scale; BMCS: Beliefs about medication compliance scale; MLHFQ: Minnesota living with heart failure questionnaire

Comparing previous hospitalization time of the patients and their mean scores of BDCS benefit and barrier subscales, the difference between the groups was found to be statistically insignificant (p>0.05). Comparing the MLHFQ mean scores and previous hospitalization time of the patients, the difference between the groups was determined to be statistically significant in both subscale mean scores and the total mean scores (p<0.01, p<0.001; Table 4).

Correlation between BDCS, BMCS, and MLHFQ Scores

The correlation was found to be statistically insignificant between BDCS and MLHFQ scores of the patients (p>0.05). When the correlation between the patients' BMCS and MLHFQ scores was examined, a negative statistically significant correlation was determined between the BMCS benefit subscale and the MLHFQ physical subscale (p<0.01). A negative statistically significant correlation was found between the BMCS benefit subscale and the MLHFQ emotional subscale (p<0.01). A negative statistically high-level significant correlation was found between the BMCS benefit subscale and the MLHFQ total score (p<0.001). A positive, statistically highly significant correlation was found between the BMCS barrier subscale and MLHFQ subscale and total scores (p<0.001; Table 5).

DISCUSSION

In this study, the patients adopted the benefit behaviors from BDCS more. In a previous study, patients stated that they were generally trying to comply with sodium reduction, but 40% of the patients did not comply (Heo, Lennie, Moser, & Okoli, 2009). In another study, patients had a score of 21.41±5.08 on the benefit subscale and 13.49±3.74 on the barrier subscale of the BDCS (Sönmez & Sıdıka, 2016). The results of the present study were consistent with these studies. Since salt-restricted diet decreased the complaints, especially edema experienced by patients with HF, the patients probably adopted benefit behaviors in dietary compliance.

The patients adopted benefit behaviors more from the BMCS. Riegel and Dickson (2016) stated that patients complied with the treatment because they saw HF as a life-threatening disease. The results of the other studies were similar to those of the present study (Oğuz & Enç, 2005; van der Wal & Jaarsma, 2008). According to the result of a study, the patients had a score of 18.81±4.81 on the benefit subscale and 20.14±5.51 on the barrier subscale of the BMCS. Contrary to the present study, the patients were determined to adopt barriers more in their medication compliance in another study. (Sönmez, 2011). The patients adopted benefit behaviors in medication compliance because the medication had an immediate effect on the symptoms experienced by the patients. Medication compliances of patients were thought to be weak because of reasons such as not understanding or not listening to what was told during the discharge and being afraid of having side effects.

In this study, the patients' physical subscale mean score was high, their emotional subscale mean score was moderate, and their total score was slightly higher than the average score in MLHFQ. In the study by Aşık-Özdemir, the physical subscale score was found to be high, emotional subscale score was moderate, and the total score was above average (Aşık-Özdemir, 2009). The high score obtained from the scale indicated low quality of life. On the basis of these results, the quality of life of patients with HF was asserted to be low, especially in their physical functions. In another study, the quality of life of the patients was at a moderate level (Barutcu & Mert, 2013). The results of the present study were similar to the results of other studies (Hallas, Wray, Andreou, & Banner, 2011; Naveiro-Rilo et al., 2010). The symptoms of the patients became severe and their quality of life was affected because they remained insufficient to diagnose the symptoms they experienced and delayed applying to health centers.

In this study, the difference between the number of hospitalization and the patients' dietary compliance was found to be statistically significant. The patients with five to seven hospitalizations complied with their diet more than those who had eight and more hospitalization. Compliance with the diet, especially the sodium restriction, was seen in the studies to decrease hospitalizations (Doukky et al., 2016; Son et al., 2011; van Der Wal, Jaarsma, Moser, Veeger, van Gilst, & van Veldhuisen, 2006). As a result of the other studies, noncompliance with the diet was determined to increase hospitalization (Agra-Bermejo, González-Ferreiro, Varela-Román, Gómez-Otero, Kreidieh, Conde-Sabarís, et al. 2017; Doukky et al., 2016; Heo et al., 2009; Lennie et al., 2011). These results were consistent with those of previous studies (Uysal & Enç, 2012). The patients' having ineffective disease management could cause hospital admissions. As a result of the noncompliance with diet among the patients with ineffective disease management, symptoms become more severe, and this might be the reason for increased hospitalizations.

In the present study, the difference between the number of hospitalizations and medication compliance of the patients was statistically significant. Patients with fewer hospitalizations had higher medication compliance. According to the result of a study, the difference between the hospitalization and medication compliance was found to be statistically significant. Noncompliance with the medication increased the hospitalizations (Sönmez, 2011), which was similar to the results of the present study. In another study, researchers found that the rehospitalization of the patients who did not have the medication compliance was higher (Chung et al., 2008). Other studies suggested that noncompliance with the medication was found to increase the hospitalization (Annema, Luttik, & Jaarsma, 2009; Dilokthornsakul et al., 2012; Fitzgerald et al., 2011; McClintock et al., 2014; van der Wal & Jaarsma, 2008; Wu, Lennie, Dekker, Biddle, & Moser, 2013; Yu, Chair, Chan, & Choi, 2015). Additionally, compliance with the treatment is an important step in self-care. Self-care deficiencies such as noncompliance with the medication and diet are known to cause emergencies (Albert et al., 2014). In a study investigating the quality of life and hospitalization, people with high self-care had decreased hospitalizations and their quality of lives enhanced (Buck et al., 2015). In another study, compliance with the treatment increased the decreases in symptoms of the patients (Wu et al., 2013). Patients were thought to comply with the medication because the medication compliance in patients with HF was beneficial in relieving symptoms and keeping the symptoms under control.

In this study, as the number of rehospitalization increased, the quality of life decreased. In another study, researchers found that the patients with a higher number of hospitalizations had the lower quality of life compared with the patients with less number of hospitalizations (Zengin, Ören, Yıldız, & Çil, 2014). In another study, researchers demonstrated that as the number of rehospitalization increased, the quality of life decreased (Aşık-Özdemir, 2009). The aforementioned study results were consistent with those of other studies (Çaloğlu, 2012; Kim & Han, 2013; Naveiro-Rilo et al., 2010; Whitaker-Brown, Woods, Cornelius, Southard, & Gulati, 2017) as well as the present study. Therefore, it could be concluded that patients who were continuously hospitalized were negatively affected physically and emotionally, which adversely affected the daily lives of the patients. These reasons were thought to cause many problems and lead to a decrease in the quality of life of the patients.

The difference between the patient's previous hospitalization time and their dietary and medication compliances was found to be statistically insignificant. The studies revealed that the rehospitalization rate within 90 days after discharge was between 15% and 30% (Kim & Han, 2013; McClintock et al., 2014). In another study, researchers determined that dietary and medication compliance decreased these hospitalizations, (Krueger et al., 2015), which was different from result of the present study. This could be thought to be caused by sociodemographic characteristics and health behaviors of the patients.

In the present study, a statistically significant difference was found between the patients' previous hospitalization time and the quality of life. The quality of lives decreased when the time between the rehospitalizations after hospital discharge shortened. In the present study, 60% of the patients were rehospitalized within 0-6 months, and this group had the worst quality of life. In a study, 23.3% of the patients were observed to be rehospitalized within 30 days (Tung, Chang, Chang, & Yu, 2017). In another study-study, 78.8% of the patients were observed to be rehospitalized within 0-6 months (Sönmez & Sıdıka, 2016). In another study, researchers determined that 56.9% of the patients were rehospitalized

within 90 days (Deek, Skouri, & Noureddine, 2016). Similar results were obtained in other studies (Kim & Han, 2013; Setoguchi & Stevenson, 2009; Sudhakar, Zhang, Kuo, Alghrouz, Barbajelata, & Sharma, 2015). Previous studies found that the quality of life of the patients with HF significantly decreased as a result of shortened duration between the hospital discharge and rehospitalization and the increased number of hospitalization (Kim & Han, 2013; Özer, 2010). These hospitalizations also led to an increase in the mortality rates (Setoguchi & Stevenson, 2009). Probably, the short duration between the hospital discharge and rehospitalization prevented the patients from coping with the disease by limiting normalization on the symptoms they were experiencing.

In this study, the quality of life enhanced when the patients adopted the benefit behaviors in medication compliance. Similarly, the quality of life of the patients who adopted the barrier behaviors more in medication compliance was found to be low. Patients with HF might experience symptoms such as dyspnea and fatigue, thereby decreasing their quality of life. Drug treatment alleviated these symptoms and affected the quality of life of the patients positively (Wu et al., 2012). Noncompliance with the medication and diet decreased the benefit expected from the treatment of patients with HF and caused exacerbation of symptoms. This noncompliance also impaired the quality of life (van der Wal & Jaarsma, 2008).

A statistically insignificant correlation was found between BDCS and MLHFQ mean scores of the patients in this study. In another study, researchers did not show any correlation between the quality of life and dietary compliance in patients with HF, which was consistent with the result of the present study (Çaloğlu, 2012). Other studies showed that compliance with reduced dietary salt enhanced the quality of life (Oğuz et al., 2010; Philipson, Ekman, Forslund, Swedberg, & Schaufelberger, 2013). Noncompliance with the dietary program prepared for the patients with HF could exacerbate the symptoms. Therefore, it could be concluded that the exacerbation of the symptoms affected the quality of life of the patients negatively.

Study Limitations

The limitation of this study was that an improbable random method was used. Therefore, the results of the study could be generalized to the patients included in the study.

CONCLUSION AND RECOMMENDATIONS

This study demonstrated that the patients with HF adopted the benefit behaviors more in medication and dietary compliances and their quality of life was at a moderate level. Further, the patients who complied with the medication and dietary treatment had less hospitalization. As the number of hospitalizations increased, the quality of life of patients decreased. In addition, patients' compliances with the medication increased the quality of life.

Therefore, this study recommended that the nurses specialized in HF treatment programs should organize the medication and dietary programs of the patients and also follow up and support the patients during the compliance period. Further studies using larger sample groups in Turkey should be performed to validate the results of this study.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of İnönü University (approval no.2015/10-6).

Informed Consent: Verbal informed consent was obtained from patients.

Author Contributions: Concept – G.D.; Design – G.D. – S.Ç.S.; Supervision – S.Ç.S.; Resources – G.D.; Materials – G.D.; Data Collection and/or Processing – G.D.; Analysis and/or Interpretation – G.D. – S.Ç.S.; Literature Search – G.D.; Writing Manuscript – G.D.; Critical Review – S.Ç.S.; Other – G.D.

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