Evaluation of Daily Life Activities and Life Qualities of Ventricular Assist Device Installed Patients*

Ventrikül Destek Cihazı Takılan Hastaların Günlük Yaşam Aktiviteleri ve Yaşam Kalitelerinin Değerlendirilmesi*

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Abstract

Conscious and professional nursing practices both during hospitalization period and after discharge have a great importance for preventing the possible complications with Ventricular Assist Device (VAD) and for maximizing the life quality. This research was conducted for the purpose of evaluating the daily life activity levels and the life qualities of the ventricular assist device installed patients.

The research is a cross-sectional type descriptive research and it was conducted with 31 ventricular assist device patients who accepted to participate the research. It was used Patient Identification Form, SF 36 Life Quality Scale, KATZ Daily Life Activities Scale and EQ-5D General Life Quality Scale for data collection. Research data was collected from the VAD installed patients who come for their medical examinations to cardiovascular polyclinics and who have not been discharged yet after the transaction through face to face interviews by creating a noiseless and peaceful environment between the dates of May 2015 and November 2015. The data obtained from the study was evaluated through SPSS 20 package program. In the data evaluation, it was used Mann Whitney U and Kruskal Wallis-H Tests, Chi-square analysis, Fisher's Exact Test and Pearson Chi-square analysis. In evaluating the result, the significance level was evaluated as $p < 0.05$.

It was specified that 80.6% (n=25) of the patients who participated the study experienced rehospitalization and the reasons of rehospitalization of 35.5% (n=11) is infection, of 25.8% (n=8) is thrombus and of 22.5% (n=7) is device problems. It was seen that 70.9% of the patients felt themselves good after the device installation. While the life qualities of the patients were founded as median according to the SF 36 Life Quality Scale and EQ-5D General Life Quality Scale, it was identified that 71.0% (n=22) of them perform their daily life activities independently according to the KATZ Daily Life Activities Scale.

It was identified that the patients became more independent, felt their health better and their life quality is increased than before the VAD.

Keywords: nursing, heart-assist devices, quality of life, nursing care

Özet

Ventrikül Destek Cihazı (VAD) ile gelişebilecek komplikasyonları önlemek ve yaşam kalitesini en üst düzeye getirmek için, hem hastane sürecinde hem de taburculuk sonrası dönemde bilinçli ve profesyonel hemşirelik uygulamaları büyük önem taşımaktadır. Bu araştırma VAD takılan hastaların günlük yaşam aktivite düzeylerini ve yaşam kalitelerini değerlendirmek amacıyla yapılmıştır.

Kesitsel tipte tanımlayıcı olan araştırma VAD takılan, araştırmaya katılmayı kabul eden 31 hasta ile gerçekleştirildi. Veri toplama aracı olarak Hasta Tanıtım Formu, SF 36 Yaşam Kalitesi Ölçeği, KATZ Günlük Yaşam Aktiviteleri Ölçeği ve EQ-5D Genel Yaşam Kalitesi Ölçeği kullanıldı. Araştırma verileri Mayıs 2015–Kasım 2015 tarihleri arasında VAD takılan, kalp damar cerrahisi polikliniklerinde kontrollerine gelenler ile işlem sonrası hastaneden henüz taburcu olmayan hastalardan, gürültüden uzak ve rahat bir ortam yaratılarak, yüz yüze görüşme ile toplandı. Çalışmadan elde edilen veriler SPSS 20 paket programında değerlendirildi. Verilerin değerlendirilmesinde Mann Whitney U ve Kruskal Wallis-H Testleri, Ki-Kare analizi, Fisher's Exact Test ve Pearson Ki Kare analizleri kullanıldı. Sonuçlar yorumlanırken anlamlılık düzeyi $p < 0.05$ olarak değerlendirildi.

Çalışmaya katılan hastaların %80.6'sının (n=25) yeniden hastaneye yatış yaptığı ve bu yatış nedenleri arasında %35.5'inin (n=11) enfeksiyon, %25.8'inin (n=8) trombus ve %22.5'inin (n=7) cihaz sorunları olduğu saptandı. Hastaların %70.9'unun cihaz takıldıktan sonra kendilerini daha iyi hissettikleri görüldü. SF 36 Yaşam Kalitesi Ölçeği ve EQ-5D Genel Yaşam Kalitesi Ölçeğine göre hastaların yaşam kaliteleri orta olarak bulunurken, KATZ Günlük Yaşam Aktiviteleri Ölçeğine göre de %71.0'inin (n=22) bağımsız olarak günlük yaşam aktivitelerini gerçekleştirdikleri saptandı.

VAD öncesine göre hastaların daha bağımsız hale geldiği, sağlıklarını daha iyi buldukları ve yaşam kalitelerinin arttığı saptandı.

Anahtar Kelimeler: hemşirelik, kalp destek cihazları, yaşam kalitesi, hemşirelik bakımı

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INTRODUCTION

According to World Health Organization (WHO), cardiac insufficiency is defined as a syndrome emerged as a result of the filling the ventricles with blood and/or the breakdown of their blood pumping property due to the structural and/or functional failure of the heart (1,2). It is reported that there are 5 million cardiac insufficiency patients and it is added 550.000 new cardiac insufficiency cases per year in United States of America (USA) (3, 4). It is estimated that there are 800.000 cardiac insufficiency patients and 3.000 of these patients have end-stage cardiac insufficiency in Turkey.

When there is no option for any other treatment in cardiac insufficiency patients, the last treatment option for extending the recovery and increasing the life quality is the heart transplantation. In Turkey, the heart transplantation rate is 1.1 per one million population for the year of 2010 (5). It was performed nearly 54.000 heart transplantations across the world until today. The number of patients waiting for organ transplantation is approximately one billion (5, 6). This situation necessitates to make live the patients during while they are waiting for transplantation as well as turning towards alternative treatment methods. Especially the technological progress increased in the recent period causes a rapid development of mechanical circulatory supports, an increase in surgical techniques such as ventricular assist device (VAD) implantation and an extensity in using these techniques.

The symptoms of the patients can be minimized through VAD, and the VAD affects the pressure/volume relation of the relevant circulatory system about the disease positively, it causes reductions in the wall thickness of left ventricle and the volumes, it reduces the antibodies of anti-adrenoceptors as well as increasing the response against adrenaline, making regress the left ventricle hypertrophy, and restoring the patients to a condition of performing their daily life activities easefully (7-11).

Even though the life qualities of the patients increase seriously after the VAD surgery, it also has negativities such as that it has many complications which increase mortality, that it is unfeasible to uninstall the device when it can not find any donor, and that it does not enable a complete recovery (9, 10, 12, 13). For this reason, conscious and professional nursing practices both during hospitalization period and after discharge have a great importance for preventing the possible complications and for maximizing the life quality. It is thought

that this study will make a significant contribution for the nurses in giving efficient, qualified and evidence-based care about the VAD because of that there is no enough literature resource due to the fact that VAD is a recently increasing treatment in Turkey.

MATERIAL and METHODS

This research was conducted for the purpose of evaluating the Daily life activity levels and the life qualities of the ventricular assist device installed patients as a cross-sectional type research. For conducting the research, it was received ethical approval from Ankara Yıldırım Beyazıt University Ethical Committee (15324997/176) and written permissions from Başkent University Ankara Hospital (31220125/222), Ankara University Cebeci Research and Application Hospital (53756990-806.01.03[806.01.03]17769) and Turkey Yüksek İhtisas Education and Research Hospital (B.10.4.İSM.4.06.00.15.1-PKK 619) and it was received written consent from the patients after informing them. The study was carried out in accordance with the principles of the Helsinki Declaration.

Because of that VAD device installation transaction has begun in 2012 in the city the research was conducted, the research population was consisted of all the patients to whom the VAD is installed (46 patients) between the years of 2012 and 2015. The reason why these hospitals were chosen for the study is that the VAD installation is performed only in these hospitals. 2 of the patients did not accept to participate the study, 12 of them could not be contacted because of they did not come for their medical examinations for the reason that they are out of town, and 1 patient was left out of the sample because of being 0-10 years old. For this reason, the research sample consists of 31 patients who volunteer for participating the research and meet the research criteria. Research data was collected from the VAD installed patients who come for their medical examinations to cardiovascular polyclinics and who have not been discharged yet after the transaction through face to face interviews by creating a noiseless and peaceful environment between the dates of May 2015 and November 2015. The application of surveys and scales took for 15-20 minutes. When the patients did not understand the questions, they were explained by the researcher.

Data was collected through using Patient Identifica-

Table 1. Distribution of the socio-demographical features of the patients (n=31).

Demographic features	n	%
Gender		
Female	7	22.6
Male	24	77.4
Age groups		
10-20	9	29.0
21-30	2	6.5
41-50	9	29.0
51-60	11	35.5
Educational status		
Illiterate	1	3.2
Primary education	19	61.3
High school	6	19.4
University	5	16.1
Marital status		
Married	18	58.1
Single	13	41.9
Working status		
Working	6	19.4
Not working	20	64.5
Stop working	5	16.1
Smoking		
Yes	4	12.9
No	16	51.6
I quit	11	35.5
Concomitant diseases *		
Diabetes mellitus	4	12.9
Hypertension	5	16.1
Cholesterol	3	9.7
Other (inguinal hernia, migraine, breast cancer, hypotension etc.)	6	19.3
BMI (body mass index)		
<18.5 (thin)	6	19.3
18.5-25.0 (normal)	13	41.9
25.0-30.0 (overweight)	9	29.0
>30.0 (obese)	3	9.8
Compliance to diet program		
Complying with diet	27	87.1
Not complying with diet	4	12.9
Surgery date (how many months before)		
0-6	11	35.5
7-12	9	29.0
13-18	4	12.9
19-24	2	6.5
25 and over	5	16.1
Hospitalization period (month)		
0-1	16	51.6
1-2	10	32.3
2 and over	5	16.1
Rehospitalization		
Yes	25	80.6
No	1	3.3
Not discharged	5	16.1
Rehospitalization frequency after discharge (n= 25)		
1	14	56.0
2	6	24.0
3	5	20.0
Reason of hospitalization*		
Infection	11	35.5
Thrombus	8	25.8
Device problem	7	22.5
Other (hemorrhage, gynecological diseases, medical examination etc.)	10	32.3

* More than one option was marked

tion Form which includes information about the individual and the diseases prepared as a result of the literature review (14-23), SF 36 Life Quality Scale, KATZ Daily Life Activities Scale and EQ-5D General Life Quality Scale. The patient identification form has 18 questions in total including 10 questions about the socio-demographical features of the patients and 8 questions about the features of the disease.

SF 36 Life Quality Scale was developed by Ware in 1987 (24) and its validity-reliability study was conducted by Koçyigit et al. in our country (25). The scale consists of 36 items and 8 dimensions. These dimensions are; physical function (10 items), social function (2 items), role limitation due to physical functions (4 items), role limitations due to emotional problems (3 items), mental health (5 items), energy/vitality (4 items), pain (2 items), and general perception of health (5 items) (26).

KATZ Daily Life Activities Scale (GYA) was developed by Katz et al. (1963) (27) and its validity-reliability study and Turkish adaptation were conducted by Kaplan (28). This scale consists of 10 titles including cleaning, shopping, transportation, food preparation, etc. (27, 29).

EQ-5D General Life Quality Scale was developed by Euro Qol group which is the Western Europe Life Quality Research Society (30) and its validity-reliability for Turkish was conducted by Kahyaoglu (2009) (31). The scale consists of two sections. EQ-5D General Life Quality Scale consists of 5 dimensions including mobility, self-care, usual activities, pain/discomfort, and anxiety/depression. It is calculated the index score ranging between -0.59 and 1 from its 5 dimensions. In the score

function, while 0 score indicates the death and 1 score indicates the perfect health, negative scores indicates the situations such as the blackout, living bedridden etc. EQ-5D General Life Quality Scale is a Visual Analogue Scale by which the individuals give values about their present health status between 0 and 100, and mark them on a thermometer-like scale. It is obtained life quality scores ranging between 0 and 100 through the scale (30).

Data analysis was conducted in SPSS 20 (Statistical Package for the Social Sciences) package program. In the data evaluation, it was used Mann Whitney U and Kruskal Wallis-H Tests, Chi-square analysis, Fisher's Exact Test and Pearson Chi-square analysis. In evaluating the result, the significance level was evaluated as $p < 0.05$.

LIMITATIONS OF THE RESEARCH

The limitations of the study are that some of the patients with VAD living outside the province and not being able to come to their controls regularly and grouping is not possible due to the small number of patients and therefore the wide age range.

RESULTS

In Table 1, it was identified that 77.4% ($n=24$) of the patients are male, 22.6% of them ($n=7$) are female; 35.5% of them ($n=11$) are in the age group of 51-60. It was specified that 64.5% of the patients ($n=20$) are primary school graduate and lower, 19.4% ($n=6$) are high school graduate, 16.1% ($n=5$) are university graduate; and 58.1% of them ($n=18$) are married (Table 1).

It was identified that 29.0% ($n=9$) of the patients experienced asthenia, 25.8% ($n=8$) experienced charging problem about the device, 19.4% ($n=6$) experienced pain and tachycardia; and the rate of incidence of other problems which are grouped as blackout, respiratory disorder, nausea and vomit is 25.8% (Figure 1).

In Figure 2, while 54.8% ($n=17$) of the patients feel themselves better as regards before VAD; 9.7% of them ($n=3$) express that they feel themselves worse as regards before the surgery.

The life qualities of the patients were found as median according to SF 36 Life Quality Scale, and EQ-5D General Life Quality Scale, and it was seen that 71.0% ($n=22$) of the patients perform their daily life activities independently according to the KATZ Daily Life Activities Scale (Table 2).

In Table 3, the majority of those who fulfill their self-care needs except washing/bathing dependently before VAD can fulfill their need independently after VAD ($p > 0.05$). As for the patients who were independent before VAD, it was identified that 35.0% ($n=7$) of them are independent, 65.0% ($n=13$) of them are dependent in their washing/bathing needs; and as for the patients who were dependent before VAD, it was identified that 45.5% ($n=5$) of them are independent and 54.5% ($n=6$) of them are dependent in their washing/bathing needs ($p > 0.05$) (Table 3).

The scores of the primary education graduate and lower patients on physical condition and physical role limitation which are two of sub-steps of SF-36 Life Quality Scale are significantly lower than the scores of high school graduate and higher patients ($p < 0.05$).

Figure 1. Distribution of the common problems in the patients after VAD ($n=31$)

*More than one option was marked. **Blackout, respiratory disorder, nausea, vomit

Figure 2. Distribution of patients' perception of their present health status as regard before VAD (n=31).

There is statistically significant difference between their EQ 5D index scale score and their educational status ($p<0.05$). EQ 5D index scale score of the high school graduate and higher patients is significantly lower than the primary education graduate and lower patients.

It could not be found an expected statistical significance because of the research is based on a small sample group. However, the results indicate that the patients became more independent, they felt their health better and their life quality increased as regards before VAD. In this context, it is thought that long-term or end-stage therapeutic

VAD installation has positive influences on life quality.

DISCUSSION

Some complications to be seen after recovery in the patients in post-VAD surgery period (13, 32, 33). In various studies, it was seen that infection (14, 18), thrombus and infection (19, 34), hemorrhage (21), and hemorrhage and thrombus (35) are among these complications. It was identified that the majority of the patients participated in our research re-hospitalized with some complications after discharge, and 56.0% of them were re-hos-

Table 2. Distribution of SF 36 Life Quality Scale, EQ-5D General Life Quality Scale and KATZ Daily Life Activities Scale scores (n=31).

SF-36 Questionnaire Form	Ave±SD*		Median		Min	Max
Physical function	28.87±15.95		35.0		0	50.0
Physical role limitation	19.35±32.73		0		0	100.0
Emotional role limitation	23.66±34.63		0		0	100.0
Pain	66.28±17.91		72.8		18.2	81.8
Mental health	41.51±9.30		43.3		23.3	56.7
Vitality (energy)	34.68±16.19		29.2		0	62.5
General health	38.97±8.26		40.0		24.0	56.0
Social function	55.65±30.08		62.5		0	100.0
EQ-5D General Life Quality Scale						
EQ 5D index scale	0.32±0.17		0.3		0.08	0.8
EQ 5D VAS (Visual Analogue Scale) scale	69.35±20.36		70.0		30.0	100.0
Katz Daily Life Activities Scale	Dependent		Partly Dependent		Independent	
	n	%	n	%	n	%
Cleaning	6	19.4	9	29.0	16	51.6
Shopping	6	19.3	6	19.3	19	61.4
Transportation	4	12.9	13	41.9	14	45.2
Food Preparing	6	19.4	4	12.9	21	67.7
Bathing	3	9.7	16	51.6	12	38.7
Dressing	1	3.2	10	32.3	20	64.5
Visiting the toilet	1	3.2	6	19.4	24	77.4
Transfer	1	3.2	5	16.2	25	80.6
Continence	0	0	5	16.2	26	83.8
Nutrition	0	0	4	12.9	27	87.1
General Scoring	1	3.2	8	25.8	22	71.0

*Ave±SD: Average±Standard deviation

pitalized once and 44.0% of them were re-hospitalized more than once. It is seen that 35.5% of the hospitalization reasons is infection, 25.8% is thrombus, and 22.5% is device problems. While this situation is consistent with the literature, it makes us think that a comprehensive and effective nursing care for the patients including the post-discharge period is quite important, that the complication rate will increase in parallel with this care, and that it will prevent rehospitalizations in the least.

VAD installed patients can perform many activities which they could not do previously because of the cardiac insufficiency such as cycling, walking and dancing, they can return their previous life styles, and they become more independent (19, 36, 37). As in the studies on VAD installed patients of Dew et al. (2000), Grady et al. (2003) and Kitko et al. (2015), most of the patients (70.9%) express that they feel themselves better after the installation of device (16, 22, 38). This situation makes us think that there is a reduction in the symptoms of the physical, psychological and sociological problems faced by the patients in spite of the negativities accompanying the device (such as the charging and cable problem of the device) and therefore

re there is an improvement in their life qualities. Our finding indicates how the life of the patients improve even with a device that have a similar prognosis except transplantation as well as indicating how it is important to raise the awareness of the society about organ transplantation. It is thought that the life quality of the patients will improve in emotional, physical and social dimensions correspondingly.

The patients have not been fulfilling their self-care needs easily because of the symptoms caused by the cardiac insufficiency (39, 40, 41). The patients become more independent with reduction in symptoms, moving easily, and the oxygen supply after VAD (7, 13). In the study conducted by Granegger et al. (2016) on Left Ventricular Assist Device (LVAD), it was specified that the patient can perform their daily life activities like healthy people after the LVAD installation (23). In the study conducted by Casida et al. (2011) for the purpose of researching and defining the life styles of 9 LVAD installed patients, they rank the external factors such as battery or cables among the reasons of the difficulties of the patients to maintain their hygiene habits (17). In our research, it was specified that the patients who perform their eating

Table 3. Comparison of the patients through their self-care needs of the patients before VAD and after VAD (n=31)

Before VAD	After VAD				Chi-square Test
	Independent		Dependent		
	n	%	n	%	p
Eating/Drinking					1*
Independent (n=27)	26	96.3	1	3.7	
Dependent (n=4)	4	100.0	0	0	
Washing/Bathing					0.537*
Independent (n=20)	7	35.0	13	65.0	
Dependent (n=11)	5	45.5	6	54.5	
Dressing/Tidying up					0.106*
Independent (n=20)	12	60.0	8	40.0	
Dependent (n=11)	10	90.9	1	9.1	
Toilet					1*
Independent (n=19)	16	84.2	3	15.8	
Dependent (n=12)	11	91.7	1	8.3	
Bed activities					0.188*
Independent (n=25)	25	100.0	0	0	
Dependent (n=6)	5	83.3	1	16.7	
Walking					1*
Independent (n=19)	17	89.5	2	10.5	
Dependent (n=12)	11	91.7	1	8.3	

* Because of that 20% of the expected value in the cells is less than 5, it was conducted Chi-square analysis with the help of Monte Carlo Simulation

and drinking activity dependently before VAD started to perform that activity 100.0% (n=4) independently after VAD. Similarly, it was found that the majority of the patients who dress, visit the toilet, walk and do bed activities dependently (%90.9, %91.7) before VAD started to perform these activities independently after VAD. It was identified that only 65.0% of the patients who fulfill their bathing need independently before VAD became dependent after VAD. While these findings are consistent with the literature, it is thought that the situation of becoming dependent in bathing self-care need is due to not being accustomed to the device and the fears about the device such as the possibility of splashing water on the device or stepping on the device cable.

It is seen recoveries in hepatic and renal functions during at least 4-5 weeks after VAD implantation. The symptoms of VAD installed patients decrease, many of them start to perform their daily life activities easily, and their life qualities increase (36, 37). In the study conducted by İşkesen et al. (2007) on the patients who have undergone coronary artery surgery, and in the study conducted by Bektaş (2014) on the patients who have undergone open heart surgery in the recent year, SF 36 Life Quality scale score was evaluated as median (20, 42). In the study conducted by Buendia et al. (2011) for the purpose of examining the relation between the functional capacity and the life quality in heart transplant patients, the average score of EQ 5D VAS Scale was specified in the 2nd month as 78.93 ± 16.10 , in the 6th month as 83.80 ± 11.30 and in the 12th month as 83.30 ± 11.10 (43). However, in our study, the life quality of the patients was specified as median according to SF 36 Life Quality Scale, and EQ-5D General Life Quality Scale. The studies in the literature which evaluate the life qualities of the patients through the SF 36 life quality are consistent with our research findings. This situation indicates that the life qualities of the patients increased after the cardiac surgeries. In line with the literature (16, 20, 36, 37, 42, 43), when the scores given by the patients about their present health status are examined, it is seen that while the patients who have acute coronary syndrome evaluate their health as worse as regards VAD installed patients, the patients who have undergone heart transplantation feel themselves better as regards VAD installed patients. One of the aims of installing VAD is to provide a bridge towards heart transplantation, and this result shows parallelism with the literature.

In the study of Özer (2002), it was specified that the

life quality of the patients with high educational status is lower than those who literate or illiterate (15). In the study of Özdemir (2009), there are significant relations between the educational status and some dimensions of life quality (44). The sub-dimensions of physical function and vitality (energy) in SF-36 scale of literate patients was found significantly low. In our study, it was seen that the more the educational level increases the more life quality increases according to SF 36 Questionnaire Form and it was found a statistical significance ($p < 0.05$). Similarly, there is a statistically significant difference between EQ 5D scale score and the educational status of the patients ($p < 0.05$). It was seen that the EQ 5D index scale score of the high school graduate and higher patients is significantly lower than the score of the primary education graduate patients. Yet, the score given by the high school graduate and higher patients for their health was founded as higher, and it was identified that the more the educational status of the patients increases the more their independency level increases in Katz Daily Life Activities Scale. In our study, it was found that while the more the educational level increases the more the life quality increases according to SF-36 Questionnaire Form and Katz Daily Life Activities Scale, the life qualities of those who have a high educational level was found as lower in EQ 5D life quality. While these findings are consistent with the literature, it indicates that the more the educational level of the patients increases the more their life quality increases, and they can perform their Daily life activities more independently.

CONCLUSION

As a result of the study, it can be recommended that it can be conducted studies with more participation in parallel with the increase in device installation, it can be conducted further studies for evaluating the VAD device and the life qualities of the patients because there are limited number of studies about the VAD device and the life qualities of the patients, it can be given trainings to the nurses on the VAD device, its indications, its contraindications and patient care through giving in-service trainings and organizing certification programs and courses.

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