

**Original Article**

# The effects of artistic and social activities during hemodialysis on the life quality, pain perception, anxiety status of the patients and intradialytic complications



Hemodiyaliz sırasında gerçekleştirilen sanatsal ve sosyal faaliyetlerin hastaların yaşam kalitesi, ağrı, kaygı durumları ve intradiyalitik komplikasyonlar üzerindeki etkileri

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**ABSTRACT**

**Introduction:** We aimed to investigate the effects of social and artistic activity support on quality of life, pain perception, and anxiety status in hemodialysis (HD) patients and the relation between occupational therapy and frequent complications of HD.

**Methods:** Volunteer instructors trained 22 patients participated in this study for wood painting for 4 hours/day, 2-3 days a week for six months. The State-Trait Anxiety Inventory (STAI I and STAI II) and Visual Analog Scale were applied before the social activity and at the 6th month. The quality of life evaluated with Short Form-36.

**Results:** The patients who participated in the social activity more than 25 hours formed the study group (n=9), and those participated less than 25 hours made control group (n=13). There were significant differences in initial and 6th month values in both STAI I and STAI II scores of the study group, and only in STAI II score in the control group (p=0.008, p=0.015, p=0.003, respectively). In the study group, while STAI I and II mean was 49.9 and 52.8 in the first month, respectively, it decreased to 30.0 and 38.8 in 6th month, respectively. In the control group, in the first month mean of STAI II score was 56.9 and it decreased to 45.3 in the sixth month. The mean of physical function capacity from SF-36 parameters increased from 73.9 to 84.4 (p=0.026) in the study group and from 47.7 to 75.8 (p=0.002) in the control group. The difference between study and control group was statistically significant (p = 0.029).

**Conclusions:** Our results support that social and artistic activities during HD have positive effects on chronic HD patients in terms of physical functioning level.

**Keywords:** Kidney failure chronic, quality of life, test anxiety scale

**ÖZ**

**Giriş:** Sosyal ve sanatsal etkinlik desteğinin hemodiyaliz (HD) hastalarında yaşam kalitesi, ağrı algısı ve anksiyete durumu üzerindeki etkilerini ve mesleki tedavinin HD sırasında sık görülen komplikasyonlarla ilişkisini araştırmayı amaçladık.

**Yöntem:** Gönüllü eğitmenler, bu çalışma için 22 katılımcıyı 6 ay boyunca, haftada 2-3 gün, günde 4 saat ahşap boyama aktivitesi çalıştırdılar. Sosyal aktivite öncesi ve 6. ayda Durumluluk ve Sürekli Kaygı Ölçekleri (STAI I ve STAI II) ve Vizuel Analog Skala uygulandı. Yaşam kalitesi Kısa Form-36 ile değerlendirildi.

**Bulgular:** Sosyal aktiviteye 25 saatten fazla katılan hastalar çalışma grubunu (n=9) oluştururken, kontrol grubu (n=13) aktiviteye 25 saatten daha az katılanlardan oluşuyordu. Çalışma grubunun hem STAI I ve hem de STAI II skorlarında, kontrol grubunda ise sadece STAI II skorlarında ilk ve 6. ay değerleri arasında anlamlı farklılıklar vardı (sırasıyla p=0,008, p=0,015, p=0,003). Çalışma grubunda sırasıyla STAI I ve II ortalamaları ilk ay 49,9 ve 52,8 iken, 6. Ayda sırasıyla 30,0 ve 38,8'e düştü. Kontrol grubunda ilk ay STAI II skoru ortalaması 56,9 olup, 6. Ayda 45,3'e düştü. SF-36 parametrelerinden fiziksel fonksiyon kapasitesinin ortalaması çalışma grubunda 73,9'dan 84,4'e (p=0,026), kontrol grubunda 47,7'den 75,8'e (p=0,002) yükseldi. Çalışma ve kontrol grubu arasındaki değişim istatistiksel olarak anlamlı bulundu (p = 0,029).

**Sonuç:** Sonuçlarımız, HD sırasında sosyal ve sanatsal aktivitelerin fiziksel işlev düzeyi açısından kronik HD hastaları üzerinde olumlu etkileri olduğunu desteklemektedir.

**Anahtar kelimeler:** Böbrek yetmezliği kronik, yaşam kalitesi, anksiyete değerlendirme ölçeği

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## Introduction

Chronic kidney disease (CKD) is defined as structural or functional anomalies of the kidney and/or the glomerular filtration rate (GFR) of less than 60 ml/min/1.73 m<sup>2</sup> for 3 months or longer [1]. Patients with stage 5 CKD having GFR less than 15 ml/min/1.73 m<sup>2</sup> should be closely monitored in terms of renal complications and the need for renal replacement therapy (RRT) [2]. In the CKD prevalence study conducted in our country, the prevalence of CKD in the general adult population was reported as 15.7% and the prevalence of stage 5 CKD was 0.15% [3]. According to these data, it is estimated that CKD affects about 7.3 million adults and that 2.4 million people of these are between the stages 3 and 5 [4].

Renal replacement therapies applied to patients with stage 5 CKD include renal transplantation, hemodialysis (HD), and continuous peritoneal dialysis (CAPD). The most common dialysis method with about 90% is HD all over the world [4]. HD is a machine-dependent RRT method performed in a dialysis center 3 times a week for 4 hours, while CAPD is an RRT method continuously performed 24 hours by the patient himself [5]. The fact that both treatment methods are chronic and troublesome brings together deterioration in the biological, psychological and social well-being in patients with stage 5 CKD who are followed by RRT. Studies conducted in this area reveal that psychological factors take an important place among the factors affecting survival of patients [6].

The use of art in therapy dates back to ancient times. Using art materials and the productive process enables people to solve emotional conflicts. It also increases social skills, awareness and self-esteem. These activities reduce anxiety and improve problem solving skills [7,8].

In this study, we investigated the effects of social and artistic activity support on quality of life, pain perception, and anxiety status in stage 5 CKD patients treated with HD as RRT, and the relation of occupational therapy with frequent complications during HD (intradialytic).

## Methods

This study was designed as a Quantitative Experimental Research. 22 of 35 patients with CKD who received chronic HD therapy in dialysis center at Ankara Numune Training and Research Hospital (ANTRH) Nephrology Clinic between November 2016 and May 2017 aged 18 to 70 years and who agreed to participate and met the inclusion criteria were included in the study. 2 patients were excluded since they refused to participate; 3 people were excluded since they were foreign citizens and had adaptation/communication problems; 1 patient was excluded due to adaptation/communication problem; and 7 patients were excluded since they changed the dialysis center and got lost during follow-up. The inclusion criteria were identified as follows: to be older than 18 years, to receive HD therapy for at least 6 months in the ANTRH programmed HD unit, to be mentally competent to answer the questions, and to agree to participate in the study. Exclusion criteria included major depression, mental retardation, schizophrenia, presence of bipolar disorder, alcohol and/or substance abuse, pregnancy, and history of trauma within last 6 months. The ethics committee approval required for the study was taken from Ethics Committee of Ankara Numune Education and Research Hospital (Date:28.12.2016 No: E-16-1174). All patients who agreed to participate in the study were informed and signed the voluntary approval form.

The social activities applied to the patients during the study period were carried out with the support of Ankara University Health Vocational School, and Cankaya Public Education Center and Evening Art School with the project. Volunteer trainers trained and guided the patients for wood painting activity for 4 hours of sessions, 2-3 days a week. Activities were performed in the HD room, at the bedside of the patient, during HD therapy. Since the patient is attached to the machine from the arm for vascular access required for the dialysis procedure, the activities were performed with one hand. Since the patients were connected to the HD machine from their arm for vascular access required for the dialysis procedure, the activities were performed with one hand. Patients' participation in the activity was voluntary and the hours they participated were noted. Patients were grouped into two as; control group (n = 13) who participated the activity less than 25 hours, and the study group (n = 9) those participated equal to or over 25 hours based on the average activity attendance duration.

Before the social activity and at the 6th month, the researcher applied a sociodemographic data questionnaire, the State-Trait Anxiety Inventory (STAI I and STAI II), Visual Analog Scale (VAS) and pain status and evaluated the quality of life with Short Form-36 (SF-36). The Turkish validity study of STAI scales was done by Öner et al., and the validity of SF-36 scale-Turkish version was done by Pinar et al [9,10]. In the sociodemographic data questionnaire prepared by researchers after reviewing literature, patients' age, gender, occupation, retired or active working, marital status, family type, his/her caregiver, and living environment of the patient were questioned. Information about the number and frequency of intradialytic complications they experienced during a total of 8 months period, 2 months preceding the activity and 6 months of activity period, were gathered from the patient file in the HD center.

## Statistical analysis

SPSS (Statistical Package for Social Sciences) (SPSS Inc, Chicago, Illinois) for Windows Version 18.0 package program was used for statistical analysis in the study. The conformation of the numerical data to normal distribution was tested by Shapiro-Wilk test. Parametric tests were applied to data with normal distribution, while non-parametric descriptive statistical tests were used for those which do not conform to the normal distribution. In sociodemographic data, chi-square test was used for the comparison of nominal data between the groups. Fisher Exact test was used when there were fewer than 5 participants in the groups. The Wilcoxon test was applied to evaluate and compare the results of STAI I, STAI II, VAS pain scores and SF-36 parameters initially and at the end of the study between the study and control groups. For the comparison of the initial and final values between the two groups, two-way ANOVA test for repeated measures was used. The number of complications experienced was calculated separately for each month and two-way ANOVA test for repeated measures was used for statistical analysis of the change between months.

## Results

The patients who participated the social activity more than 25 hours formed the study group (n=9), while the control group (n=13) was consisted of those who participated the activity less than 25 hours. Male gender ratio was 44% (4 in 9) in the study group, while it was 85% (11 in 13) in the control group. The mean participation duration of the patients was  $25.1 \pm 5.3$  hours (min: 0 -max: 80 hours).

The study and control groups were comparable in terms of gender, age, marital status, family type and HD treatment duration (Table 1).

**Table 1.** Sociodemographic aspects

Characteristics	Study group (n = 9)	Control group (n = 13)	p value
Gender (% (n))			
Female	56% (5)	15% (2)	0.074 <sup>a</sup>
Male	44% (4)	85% (11)	
Marital status (% (n))			
Married	22% (2)	69% (9)	0.080 <sup>a</sup>
Single-widowed	78% (7)	31% (4)	
Family type (% (n))			
Nuclear family	78% (7)	46% (6)	0.203 <sup>a</sup>
Extended family	22% (2)	54% (7)	
Age (mean $\pm$ SD)	$39.4 \pm 4.5$	$50.7 \pm 3.2$	0.051 <sup>b</sup>
Dialysis duration (months) (mean $\pm$ SD)	$64.1 \pm 19.2$	$66.8 \pm 21.4$	0.744 <sup>b</sup>

Notes: <sup>a</sup>Fisher's exact test; <sup>b</sup>Mann-Whitney U test.

When the groups were examined as a whole, 4 of the patients were doing their own care, 6 of the patients' spouses, 11 patients' first degree relatives were supporting their daily activities, and 1 patient had no proximity of blood with his caregiver. Three of them were working actively in their profession, and 19 patients were not.

In the evaluation of STAI I, STAI II, VAS scores and the SF-36 parameters within and between groups at 0 and 6 months; there was a significant difference in STAI I and STAI II scores in the study group between initial and 6th month values, while there was a significant difference only in STAI II score in the control group between initial and 6th month evaluations ( $p=0.008$ ,  $p=0.015$ ,  $p=0.003$ , respectively). There was also a significant difference between the study and control groups in STAI I score between baseline and 6th month evaluation ( $p<0.001$ ) (Table 2).

**Table 2.** STAI I, STAI II and VAS results and level of significance after six months' intervention (whole group)

Group Variable	Study Group (n=9)			Control Group (n=13)			Study x control group's p value <sup>b</sup>
	Initial scores	Final scores (6 <sup>th</sup> month)	p value <sup>a</sup>	Initial scores	Final scores (6 <sup>th</sup> month)	p value <sup>a</sup>	
<b>STAI-I</b>	$49.9 \pm 13.5$	$30.0 \pm 4.4$	<b>0.008</b>	$44.6 \pm 10.1$	$42.5 \pm 11.0$	0.401	<b>&lt;0.001</b>
<b>STAI-II</b>	$52.8 \pm 7.6$	$38.8 \pm 11.6$	<b>0.015</b>	$56.9 \pm 12.4$	$45.3 \pm 12.5$	<b>0.003</b>	0.629
<b>VAS</b>	$1.5 \pm 2.2$	$2.2 \pm 1.4$	0.260	$2.8 \pm 3.2$	$2.5 \pm 1.6$	0.836	0.317

Notes: Study Group >25 hours; Control Groups  $\leq 25$  hours; <sup>a</sup>Wilcoxon test; <sup>b</sup> two-way repeated measures ANOVA; Bold values indicate statistical significance

When the SF-36 parameters were analyzed, a significant improvement was observed in the study group after 6 months of intervention in physical function, physical role strength, social functioning, and mental health scores ( $p=0.026$ ,  $p=0.024$ ,  $p=0.041$ , and  $p=0.020$ , respectively). In the control group, there was a significant difference in physical function, exhilaration, social functioning, emotional role, mental health from baseline to the 6th month evaluation ( $p= 0.002$ ,  $p= 0.005$ ,  $p=0.028$ ,  $p=0.042$ , and  $p=0.009$ , respectively). Only change in physical function parameter was statistically significant between the groups ( $p=0.029$ ) (Table 3).

**Table 3.** SF-36 survey results and level of significance after six months' intervention (whole group)

Group Variable	Study Group (n=9)			Control Group (n=13)			Study x control group's p value <sup>b</sup>
	Initial scores	Final scores	p value <sup>a</sup>	Initial scores	Final scores	p value <sup>a</sup>	
Functional capacity	$73.9 \pm 31.0$	$84.4 \pm 26.7$	<b>0.026</b>	$47.7 \pm 37.3$	$75.8 \pm 25.0$	<b>0.002</b>	<b>0.029</b>
Physical aspects	$36.1 \pm 45.2$	$75.0 \pm 28.0$	<b>0.024</b>	$25.0 \pm 43.3$	$50.0 \pm 39.5$	0.108	0.392
Pain	$78.7 \pm 17.6$	$76.0 \pm 20.5$	0.684	$67.5 \pm 27.3$	$65.5 \pm 17.0$	0.753	0.918
General status of health	$40.2 \pm 18.1$	$52.8 \pm 20.3$	0.161	$40.5 \pm 22.4$	$43.5 \pm 22.0$	0.237	0.123
Vitality	$51.7 \pm 17.0$	$65.0 \pm 17.0$	0.062	$35.8 \pm 25.6$	$50.0 \pm 23.1$	<b>0.005</b>	0.904
Social aspects	$52.7 \pm 20.5$	$65.1 \pm 20.7$	<b>0.041</b>	$46.9 \pm 21.8$	$54.6 \pm 17.4$	<b>0.028</b>	0.380
Emotional aspects	$44.4 \pm 52.7$	$77.8 \pm 44.1$	0.083	$12.8 \pm 31.9$	$33.2 \pm 43.0$	<b>0.042</b>	0.468
Mental health	$53.3 \pm 11.0$	$65.3 \pm 14.2$	<b>0.020</b>	$48.0 \pm 15.0$	$58.8 \pm 13.2$	<b>0.009</b>	0.824

Notes: Study Group >25 hours; Control Groups  $\leq 25$  hours; <sup>a</sup>Wilcoxon test; <sup>b</sup> two-way repeated measures ANOVA; Bold values indicate statistical significance.

When the complications in the last 8 months and the associated outcomes of the participants were evaluated; there was no significant difference between the groups in terms of frequency of complications per session and frequency of complications within months. The comparison of the distributions of complications in the months between the groups is shown in Table 4.

**Table 4.** Relationship between complications during hemodialysis and occupational activity support (last 8 months)

Group Variable	Study Group (n=9) Mean $\pm$ SD <sup>b</sup>	Control Group (n=11) Mean $\pm$ SD <sup>b</sup>	Study x control group's p value <sup>a</sup>
Unable to complete HD session	13.3 $\pm$ 2.760	14.7 $\pm$ 4.122	0.471
Interruption to HD session	17.8 $\pm$ 5.056	10.9 $\pm$ 2.397	0.198
Muscle cramps	19.8 $\pm$ 6.986	13.4 $\pm$ 3.938	0.245
Hypotension	13.7 $\pm$ 6.885	14.0 $\pm$ 3.384	0.463
Nausea and vomiting	2.7 $\pm$ 1.222	1.6 $\pm$ 0.675	0.521
Other	1.2 $\pm$ 0.493	0.6 $\pm$ 0.208	0.127

Notes: Other; fever, headache, chest and back pain, itching. Study Group >25 hours; Control Groups  $\leq$ 25 hours. <sup>a</sup> Two-way repeated measures ANOVA; <sup>b</sup> Complications' means total of before 2 months and during 6 months occupational activity; SD, Standard deviation

## Discussion

In our study where the effects of social and artistic activity support on the life quality, anxiety status and intradialytic complications in chronic HD patients were evaluated, it was shown that social and artistic activities had significant effects on the patients' physical functioning. Previous studies have reported that psychological factors significantly influence the survival in chronic HD patients who are under increased risk of impairment in biological, psychological and social well-being [6]. There are few studies investigating the effectiveness of social activities implemented in patients receiving HD therapy. The use of art materials and the productive process make an important contribution to accomplish the emotional conflicts of people. It also improves social skills, and increases awareness and self-esteem. These activities reduce anxiety and improve problem solving skills [7].

Patients on chronic HD therapy are more likely to have anxiety disorder due to many factors such as machine dependence, length of dialysis, disruption of physical condition and family order, or complications. Cetinkaya et al. have found the mean scores of the emotional state and continuous anxiety scale as 37.0 and 48.4, respectively in patients under HD treatment [11]. Senturk et al. reported these values as 38.0 and 44.6 [12]. In our study, we found the scores for the emotional state and continuous anxiety scale as 49.9 and 52.8 in the study group, and 44.6 and 56.9 in the control group, respectively, before the intervention. The results of repeated measurement at the 6th month were 30.0 and 38.8 in the study group, and 42.5 and 45.3 in the control group, respectively. Statistical analysis within the groups showed significant differences in the emotional state and anxiety scale values of the study group between the baseline and 6th month values. In a study by Midilli et al., a significant improvement was observed in STAI I scores compared to the control group in patients under HD who were listening music at the 30th minute of music listening compared to the pre-dialysis value [13]. In a study by Babamohamadi et al., the combined mean STAI values showed significant improvement at the 1st month of the study compared to the control group in the study group who recited Quran [14].

When the results of the SF-36 survey were analyzed, there was a significant improvement in the physical functioning parameters at the 6th month compared to baseline values in the study group. In the study group, significant improvements were observed in the physical function, physical role strength, social functioning and mental health parameters at the 6th month when assessed within the group. In the control group, there was a significant improvement in physical function, vitality, social functioning, emotional role strength and mental health parameters at 6 months according to baseline. In a study by Mariotti et al., hemodialysis patients were given occupational therapy during the HD session. The occupational therapy activities in this study included painting on the canvas chosen by the person him/herself, various hand work, chess, checkers, and domino. In this study, no significant difference was found between the study and control groups in any parameters of SF-36 after 5 months of activity application. While there was no significant difference in the mental health parameters in the study group between the baseline and 5th month, significant improvement was found from the baseline to the 5th month values in the pain perception parameters of the control group. When women and men were evaluated separately in this study, significant improvement was observed in pain perception parameters at the 5th month in the study group compared to the control group in women [15]. There are few studies in the literature to evaluate the effect of activity therapy during HD on quality of life. We think that nondifference between the groups and the improvement in the control group at the end of the study may be due to the fact that our dialysis center is small and that study and control groups have received HD treatment at the same session. When the questionnaires were reviewed again, it was observed that the patients described 'pain' as the pain they experienced during the vascular access to connect to the HD machine at the beginning of the treatment.

Intradialytic hypotension, one of the most common complications in chronic HD patients, is observed in 10-30% of each HD sessions [16]. In our study, the frequency of hypotension per session during the 8-months of follow-up period was found to be 6.4% in the study group and 5.2% in the control group. The pathogenesis of muscle cramps, another common complication, is unknown. Its frequency is reported as 5-20% [16]. The incidence of muscle cramps during the study was 4.4% in the study group and 5.5% in the control group. Nausea and vomiting due to dialysis is another common complication that can be caused by many different factors, the most common cause of which is hypotension. Its incidence has been reported to be 5-15% [16]. In our study, this complication was observed 0.8% in the study group and 0.6% in the control group. Other common side effects related to dialysis were headache (5%), itching (5%), back pain (2-5%), and fever and shivering (2%) [16]. Since these complications were rarely encountered in our study, they were all assessed together under the title of 'other complications' and its incidence was 0.3% in the study group and 0.3% in the control group. At the end of 8 months, no significant difference was found between the groups with

respect to the distribution of any complications within months. These results may be related to the few frequent occurrences of intradialytic complications in the study population.

## Limitations

Limitations of our study include a relatively small sample size, short follow-up period, and performing dialysis of the control group and the study group at the same session.

## Conclusion

According to the results of our study, engage in artistic or social activities during hemodialysis sessions, lead to decrease in patients' state anxiety scores. Only the physical aspect parameter on the quality of life scale was found to be significantly different compared to the control group. Although detected significant improvement in trait anxiety and from SF-36 parameters physical aspect, social aspect, mental health at the end of 6 months, it was not different from the improvement in this control group. Our results support that this program is effective to reduce the anxiety of patients. However, a serious cost is required to implement such a program in hemodialysis centers. Literature data is not sufficient to recommend the dissemination of this program. Future research in this area should focus on replication of the study results with larger samples and implementation of personalized programs.

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