



# Integrated Treatment Methods Applied for Fatigue in Hemodialysis Patients

## Hemodiyaliz Hastalarında Yorgunluğa Yönelik Uygulanan Bütünleşik Tedavi Yöntemleri

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### ABSTRACT

Chronic kidney disease (CKD), which is an important public health problem both in the world and in our country, is characterized by the irreversible loss of kidney functions, and many organs and systems are affected. Hemodialysis (HD), in addition to being a treatment that should be applied until the end of life and prolonging life unless successful kidney transplantation is performed, also causes the emergence of biological, psychological, social and economic problems arising from the treatment. Fatigue, which is one of the frequently encountered problems related to its biological dimension, affects the daily life activities of the individual and reduces the quality of life. Fatigue is defined as an irresistible feeling of exhaustion and occurs in situations such as accumulation of waste materials, muscle weakness, inflammatory process, fluid-electrolyte imbalance, anemia. It is important to combine pharmacological and integrated treatment methods with a qualified and comprehensive nursing care in the control of fatigue caused by CKD or HD. While drugs for anemia and depression are often used in pharmacological treatment for relieving fatigue; in integrated treatment, programming of daily activities, helping the individual, exercise, relaxation, yoga, acupressure, hypnosis, reflexology, aromatherapy and massage are used. In this study, it is aimed to provide information about effective, integrated treatment methods on fatigue experienced by patients undergoing HD.

**Keywords:** Nursing, hemodialysis, fatigue, integrated treatments

### ÖZ

Dünyada hem de ülkemizde önemli bir toplum sağlığı problemi olan kronik böbrek yetmezliği (KBY), böbrek işlevlerinin geriye dönüşsüz kaybı sonucunda ortaya çıkan ve beraberinde pek çok organ ve sistemin etkilendiği bir tablodur. Hemodiyaliz (HD) tedavisi, başarılı böbrek transplantasyonu yapılmadıkça yaşamın sonuna kadar uygulanması gereken ve yaşam süresinin uzamasını sağlayan bir tedavi olmasının yanı sıra tedaviden kaynaklı biyolojik, psikolojik, sosyal ve ekonomik sorunların da ortaya çıkmasına sebep olmaktadır. Biyolojik boyutuyla ilgili sıklıkla yaşanan sorunlardan yorgunluk, bireyin günlük yaşam aktivitelerini olumsuz etkileyerek yaşam kalitesini düşürmektedir. Yorgunluk, karşı konulamayan bir tükenme duygusu olarak tanımlanmakta ve daha çok atık maddelerin birikmesi, kas güçsüzlüğü, inflamatuvar süreç, sıvı-elektrolit dengesizliği, anemi gibi durumlarda ortaya çıkmaktadır. KBY ya da HD tedavisine bağlı olarak ortaya çıkan yorgunluğun kontrolünün sağlanmasında farmakolojik ve bütünleşik tedavi yöntemlerinin nitelikli ve kapsamlı bir hemşirelik bakımı ile birleştirilmesi önemlidir. Yorgunluğun giderilmesi ya da hafifletilmesine yönelik yapılan farmakolojik tedavide sıklıkla anemiye ve depresyona yönelik ilaçlar verilirken, bütünleşik tedavide ise günlük aktiviteleri programlama, bireye yardımcı olma, egzersiz, relaksasyon, yoga, akupresör, hipnoz, refleksoloji, aromaterapi ve masajdan yararlanılmaktadır. Bu çalışmada, HD alan hastaların deneyimlediği yorgunluk üzerine etkili, bütünleşik tedavi yöntemleri hakkında bilgi verilmesi amaçlanmıştır.

**Anahtar Sözcükler:** Hemşirelik, hemodiyaliz, yorgunluk, bütünleşik tedaviler

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## Introduction

Chronic kidney disease (CKD), regardless of the etiology of the underlying kidney disease, is a progressive and irreversible condition characterized by a decrease in the glomerular filtration rate (GFR) below 60 mL/min/1.73 m<sup>2</sup>, in which many organs and systems are affected (1). In this disorder, there is a decrease in GFR, which indicates the rate of removal of waste materials from the body, along with irreversible losses in the functions of regulating the fluid-electrolyte balance of the kidney and fulfilling metabolic-endocrine functions (2).

The results of epidemiological studies conducted in different countries on CKD show similarity (3,4) and according to these results, the rate of CKD in the world varies between 10-16% (5). Although most of them are in developed countries, more than 2 million people all over the world continue to live with dialysis and kidney transplant treatments (6) and this number is expected to double in the next 10 years (5). In Turkey, the rate of CKD in the adult population is 15.7%. According to the Chronic Renal Disease In Turkey-CREDIT study, the incidence of the disease in men is 12.8% and in women 18.4%. In addition, it has been determined that the incidence of the disease increases with age, and the risk of CKD is much higher in those residing in the Marmara and Southeastern Anatolia regions and rural areas (7).

According to the classification made by the National Kidney Foundation-Kidney Disease Outcomes Quality Initiative/NKF-KDOQI in 2002, CKD consists of 5 stages (5,7). The first stage is the stage in which GFR ( $\geq 90$  mL/min/1.73 m<sup>2</sup>) is not affected, but the patient has symptoms of proteinuria/albuminuria or changes in kidney imaging. In the second stage, GFR (60-89 mL/min/1.73 m<sup>2</sup>) regresses with kidney damage, in the third stage, GFR (30-59 mL/min/1.73 m<sup>2</sup>) regresses moderately and functional losses become biochemically evident. In the fourth stage, there is a severe regression in GFR (15-29 mL/min/1.73 m<sup>2</sup>) and the uremic picture becomes evident. In the fifth stage, called end stage renal disease (ESRD), GFR falls below 15 mL/min/1.73 m<sup>2</sup> and renal replacement therapies (RRT) become mandatory (5,7).

Renal replacement therapies (RRT): Hemodialysis (HD) includes peritoneal dialysis and kidney transplantation. In our country, according to the Joint Report of the Ministry of Health and the Turkish Society of Nephrology, it was stated that the number of patients undergoing RRT increased from year to year, and as of the end of 2019, a total of 83,783 patients, including pediatric patients, were administered RRT, and the most common form of RRT was HD with a rate of 73.21% (8).

## Hemodialysis

Hemodialysis is the process of purifying the blood taken from the patient from excess fluid and electrolytes (9), along with uremic toxic substances, through a semi-permeable membrane and HD machine (10). In order to perform the HD procedure, the patient needs an arteriovenous fistula/graft or a central catheter that can provide adequate blood flow (approximately 300-600 mL/min in an adult). By providing anticoagulation in one of these ways,

the blood taken to the extracorporeal (outside the body) area is purified from excess fluid, electrolyte and metabolic wastes as a result of filtering towards the dialysis solution moving in the opposite direction and on the other side of the dialyzer while passing through the semipermeable membrane (9,10).

Hemodialysis is a form of treatment that should be applied until the end of life unless successful kidney transplantation is performed (11). The patient is included in the dialysis program 2 or 3 times a week, for an average of 4 or 6 hours, considering creatinine clearance, residual renal function, and clinical status (12).

## Problems Experienced by Patients Due to Hemodialysis

In addition to being a form of treatment that prolongs life expectancy, HD also causes biological, psychological, social and economic problems arising from treatment (13). It is stated that patients entering HD are more likely to face malnutrition, inflammation, repeated hospitalization and death compared to other individuals, since it is a primary disease that basically causes kidney failure, and this situation negatively affects general well-being and quality of life (14). At the same time, patients face with negativities such as being dependent on a machine and institution, dietary restriction, social isolation, deterioration in body image, sexual problems, differentiation in family roles, economic problems, difficulties in daily life and social activities, lack of communication with healthcare professionals, and inability to do their job. It is emphasized that the tendency to depression increases in individuals (15). In addition, patients may face acute and chronic complications arising from the HD procedure. While hypotension, cramps, nausea-vomiting, head-chest-back pain, itching and fever-chills are counted among the acute complications (16); dialysis dementia, acceleration in cardiovascular diseases, pericarditis, pleural effusion, uremic bone disease, hypertension, aluminum intoxication, thrombosis, anemia, and hepatitis B and C are among the chronic complications (17).

In the literature, it is stated that patients receiving HD mostly experience fatigue problems (18,19). In a study conducted by Usta and Demir (18) on patients receiving HD, they determined that 52.2% of the patients had fatigue problems in the pre-HD period, 43.3% during HD and 84.4% after HD. Murtagh and Weisbord (19) reported in a systematic review that patients receiving dialysis treatment experienced fatigue problems between 12% and 97%.

## Fatigue and Nursing Care in Individuals Receiving Hemodialysis

Fatigue, which is frequently experienced by patients, is defined as an irresistible feeling of exhaustion and occurs mostly in conditions such as accumulation of waste materials, muscle weakness, inflammatory process, fluid-electrolyte imbalance, and anemia (17,20).

Fatigue is a problem that needs to be intervened early, since it negatively affects the patient's quality of life as well as being

life-threatening (21). Therefore, in nursing care, nurses should carefully define the fatigue experienced by the patients, and identify the problems that develop due to fatigue through observation. In addition, by making a detailed evaluation after the determination of the problems; they should determine the effects of the problem on the daily living activities of the patients and make applications to reduce the effects on the patients. In nursing practices; planning activities and determining priorities (22), supporting daily activities at the point where they cannot perform, having active passive exercises, ensuring regular and correct use of prescribed drugs in case of anemia and depression, and enabling patients to share their experiences about fatigue with group meetings (23). In addition, exercise, relaxation, yoga, acupressure, hypnosis, reflexology, aromatherapy and massage are among the interventions for fatigue (24-57). These initiatives are listed below.

### **Exercise**

In patients with CKD, there is a decrease in muscle strength and cardiovascular capacity together with the decrease in kidney functions. With decreasing cardiovascular capacity, aerobic exercise capacity also decreases. This is an important factor affecting mortality in patients with CKD. It is stated that aerobic exercise has positive effects on this factor and reduces fatigue (24-27). Salehi et al. (28) aimed to determine the effect of mini-bike exercise for 20 minutes twice a week for 3 months on fatigue in patients receiving HD in their randomized controlled research; they found a significant decrease in the fatigue level of the intervention group compared to the control group at the third month and 1 month after the intervention. Other studies have shown that exercise may be beneficial in relieving fatigue in patients receiving dialysis (29-31).

### **Relaxation**

Relaxation is a method in which relaxation is achieved by performing stretching and relaxation exercises on the muscles. Amini et al. (32) investigated the effects of progressive muscle relaxation (PMR) and aerobic exercise (AE) on fatigue, sleep quality, and anxiety in patients receiving HD. PMR and AE were applied to the groups other than the control group for 60 days, and especially when PMR was compared with AE, it was found that PMR was more effective in fatigue, sleep quality and anxiety (32).

### **Yoga**

It is the fusion of the body, mind and spirit to form a single whole. It is a philosophy that aims to bring happiness, success and enlightenment through physical, mental and spiritual discipline by increasing the flexibility of the body (33). Yurtkuran et al. (34) performed their randomized controlled study in patients receiving HD. They made the experimental group do yoga-based exercise for 30 minutes/day twice a week for 3 months, and they evaluated the fatigue, pain management, sleep disturbance, grip strength and some biochemical values (urea, creatinine, alkaline phosphatase, cholesterol, erythrocyte and hematocrit), and stated that yoga was effective on them.

### **Acupressure (Shiatsu)**

It is a massage technique applied to the acupuncture points on the fingers and palms and the energy-carrying meridians in the body, based on traditional Chinese Medicine, consisting of the words shi = finger and atsu = pressure. It is also called needle-free acupuncture (35). Cho and Tsay (36) examined the effect of acupressure on fatigue and depression in patients with ESRD in Taiwan. They applied acupressure to both lower extremities of the experimental group for 12 minutes, 3 times a week for 4 weeks, and they stated that depression and fatigue levels decreased in the experimental group compared to the control group (36). Sabouhi et al. (37) applied acupressure treatment to both hands and legs and waist for 20 minutes, 3 days a week for four weeks in their study examining the effect of acupressure on fatigue in patients receiving HD, and they stated that acupressure was an integrated treatment that reduced fatigue. Eglence et al. (38) applied acupressure treatment to the leg of the patient for 25 minutes, 3 times a week for 4 weeks in their study investigating the effect of acupressure treatment on fatigue in patients receiving HD, and they found that the experimental group had a lower fatigue rate than the control group.

### **Hypnosis**

It is a state between sleep and wakefulness, in which changes in perception, memory, emotion and thought can occur, which creates a tendency for suggestion through gaze or other means (39). Untas et al. (40) found that anxiety, depression, fatigue, and sleepiness decreased after hypnosis in their study examining the effects of hypnosis on anxiety, depression, fatigue, and sleepiness in patients receiving HD.

### **Reflexology**

Reflexology is the stimulation of nerves and blood circulation by applying deep pressure to the reflex points corresponding to all parts of the body, and it activates the nerve energy blocks in the body and ensures a balanced distribution of energy throughout the body. It is preferred because the points where the organs are reflected on the hands and especially on the feet are wider (41). Özdemir et al. (42) applied three sessions of reflexology treatment to the experimental group after HD, each session lasting 30 minutes, for a total of one week in their study to evaluate the effect of foot reflexology on fatigue, pain, and cramps in patients receiving HD. They found that reflexology reduced cramp levels. Unal and Akpınar (43) applied reflexology and back massage for 30 minutes before HD twice a week for 4 weeks to patients in the reflexology and back massage groups in their study examining the effectiveness of reflexology and back massage in increasing the sleep quality of patients undergoing HD and relieving fatigue, and they found that reflexology and back massage improved sleep quality and reduced fatigue. Roshanravan et al. (44) examined the effect of foot reflexology on fatigue in patients receiving HD by forming intervention, placebo and control groups, and they found that the fatigue level of the intervention group decreased significantly after the reflexology application, there was no significant difference in the placebo group, and there was a significant increase in the fatigue in the control

group. Bazzi et al. (45) applied reflexology to the experimental group for 30 minutes, twice a week for 5 weeks in their study examining the effect of foot reflexology on the severity of fatigue in patients receiving HD, and they found a significant difference between the control group and the intervention group, and they found that reflexology reduced fatigue. Ahmadidarrehshima et al. (46) applied foot reflexology and back massage 2 days a week for a total of 3 weeks in their semi-experimental research examining the effect of foot reflexology and back massage on the severity of fatigue in patients receiving HD, and at the end of the application, it was stated that the fatigue level was lower in the group that received foot reflexology than the group that received back massage. In a study conducted by Sharifi et al. (47), in which they examined the effect of foot reflexology on the severity of fatigue in patients receiving HD, they stated that reflexology significantly reduced the level of fatigue in the experimental group compared to the control group.

### Aromatherapy

It is performed as a result of taking essential oils obtained from plants, usually by skin route or inhaler (48). Kang and Kim (49) examined the effects of hand massage with aromatic oils on the pruritus, fatigue and stress of patients undergoing HD. They applied aroma hand massage to the hand of the experimental group without arteriovenous fistula 12 times for 5 minutes and stated that aroma hand massage was an effective nursing intervention to reduce pruritus, fatigue and stress in patients undergoing HD (49). Muz and Taşçı (50) applied two-minute aromatherapy (lavender oil and sweet orange) by inhalation before going to bed for a month to the patients in the intervention group receiving HD, and at the end of the fourth week, they found a significant decrease in the fatigue level of the patients in the intervention group compared to the patients in the control group.

### Massage

By stimulating the sensitive receptors in the skin and subcutaneous tissue, massage provides relaxation of the muscles, accelerates the blood and lymph circulation, ensures the removal of metabolic wastes such as BUN, creatinine, uric acid, lactic acid, and has a relaxing and energy-increasing effect by stimulating the parasympathetic nervous system (51-53). With its psychosedative effect, it also reduces the feeling of fatigue (53). Hasankhani et al. (54) found that back massage applied for 10 minutes, 3 days a week for 4 weeks to patients receiving HD significantly reduced the level of fatigue. Shahdadi et al. (55) applied back massage to the experimental group for 10 minutes, twice a week for 3 weeks in their study examining the effect of back massage on fatigue in patients receiving HD, and they reported that fatigue in the experimental group decreased significantly. Lee (56) applied hand massage to the experimental group for 5 minutes, 3 times a week for 4 weeks in his study examining the effect of hand massage on fatigue, stress and depression in patients receiving HD, and he found that hand massage reduced the level of fatigue and stress. Habibzadeh et al. (57) applied foot massage for 20 minutes, 3 times a week for 8 weeks to patients who received

HD and they stated that the mean fatigue score of the group that received classical foot massage decreased significantly, and that there was a significant decrease in the level of fatigue in the experimental group compared to the control group.

### Conclusion

As can be seen from the statistical values announced by the Turkish Society of Nephrology, the number of patients receiving RRT is increasing in parallel with the increase in the number of patients with CKD every year. This situation also increases the possibility of reflection of the biological, psychological, social and economic problems that occur in the patient due to both the disease and dialysis to the society. In this respect, the nurse has a key position in solving the existing or potential problems of the patients. The nurse, who undertakes the holistic, comprehensive and qualified care of the patients, can use integrated treatment methods as well as pharmacological methods to solve the biological problems seen in the patient. The nurse can also solve the patient's problem by utilizing integrated treatments, especially in reducing the level of fatigue.

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