

BÖBREK NAKLİ ALICILARINDA ÖZ-YÖNETİM GÜCÜNÜ ETKİLEYEN PARAMETRELERİN ARAŞTIRILMASI

INVESTIGATION OF PARAMETERS AFFECTING SELF-MANAGEMENT POWER IN KIDNEY TRANSPLANT RECIPIENTS

Elif DİZEN KAZAN, Onur TUNCA

Afyonkarahisar Sağlık Bilimleri Üniversitesi Tıp Fakültesi, İç Hastalıkları Ana Bilim Dalı

ÖZET

AMAÇ: Böbrek nakli son dönem böbrek yetmezliği olan hastalarda yapılabilen renal replasman tedavisi türlerinden birisidir. Hastanın yaşamını ve sağlığını idame ettirmeyi gerektiren aktiviteleri yapabilme gücüne öz-yönetim gücü denir. Öz-yönetim gücü yüksek olan hastalarda daha iyi sağlık sonuçları olması kaçınılmazdır. Bu çalışmamızda böbrek nakli alıcılarında öz-yönetim gücünü etkileyen parametreleri araştırmayı amaçladık.

GEREÇ VE YÖNTEM: Nefroloji polikliniğinden takipli ve Temmuz 2022 - Eylül 2022 tarihleri arasında nefroloji polikliniğine başvuran tüm böbrek nakli alıcıları ile görüşüldü. Öz-yönetim gücü öz-bakım ajansı ölçeği kullanılarak değerlendirildi. Öz-yönetim gücü ile korele bulunan parametreler lineer regresyon analizi ile değerlendirildi.

BULGULAR: Çalışma 128 böbrek nakli alıcısı ile yapıldı. Hastaların ortalama yaşı 44.63 ± 13.5 yıldır. Ortalama öz-yönetim gücü skoru 112.86 ± 14.6 idi. Öz-yönetim gücü ile yaş, kullanılan ilaç sayısı, nakilden sonra geçen süre ve kronik hastalık sayısı arasında bir korelasyon saptandı. Lineer regresyon modelinde öz-yönetim gücünü etkileyen en güçlü parametre yaş olarak bulundu.

SONUÇ: Böbrek nakli alıcılarında öz-yönetim gücünü etkileyen faktörlerin iyi bilinmesi ile hem greft hem de hasta sağlığını iyileştirilebilir. Demografik ve klinik bazı faktörler öz-yönetim gücünü etkileyebilir. Böbrek naklinde başarı daha çok nakil merkezine atfedilse de hastanın öz-yönetim gücünün de bu başarıya katkı sağlayabileceği akıld tutulmalı ve öz-yönetim gücünü geliştirebilecek yaklaşımlar sergilenmelidir.

ANAHTAR KELİMELEER: Böbrek nakli, Öz-yönetim, Yaş

ABSTRACT

OBJECTIVE: Kidney transplantation is one of the types of renal replacement therapy that can be performed in patients with end-stage renal disease. The power to perform activities that require the patient to maintain his life and health is called self-management power. Better health outcomes are inevitable in patients with high self-management power. In this study, we aimed to investigate the parameters affecting the self-management power in kidney transplant recipients.

MATERIAL AND METHODS: All kidney transplant recipients who were followed up from the nephrology outpatient clinic and applied to the nephrology outpatient clinic between July 2022 and September 2022 were interviewed. Self-management power was assessed using the self-care agency scale. Parameters correlated with self-management power were evaluated by linear regression analysis.

RESULTS: The study was conducted with 128 kidney transplant recipients. The mean age of the patients was 44.63 ± 13.5 years. The mean self-management power score was 112.86 ± 14.6 . A correlation was found between self-management power and age, number of drugs used, time after transplantation, and number of chronic diseases. Age was found to be the strongest parameter affecting self-management power in the linear regression model.

CONCLUSIONS: Both graft and patient survival can be improved with a good knowledge of the factors that affect self-management in kidney transplant recipients. Some demographic and clinical factors may affect the power of self-management. Although the success in kidney transplantation is mostly attributed to the transplantation center, it should be kept in mind that the self-management power of the patient can also contribute to this success, and approaches that can improve the self-management power should be applied.

KEYWORDS: Kidney transplantation, Self-management, Age

Geliş Tarihi / Received: 05.08.2022

Kabul Tarihi / Accepted: 11.11.2022

Yazışma Adresi / Correspondence: Dr. Öğr. Elif DİZEN KAZAN

Afyonkarahisar Sağlık Bilimleri Üniversitesi Tıp Fakültesi, İç Hastalıkları Ana Bilim Dalı

E-mail: elifdizen@hotmail.com

Orcid No (Sırasıyla): 0000-0003-3550-0964, 0000-0003-1958-7617

Etik Kurul / Ethical Committee: Afyonkarahisar Sağlık Bilimleri Üniversitesi Etik Kurulu (01.07.2022/8-358).

INTRODUCTION

Chronic kidney disease (CKD) is an important public health problem (1). In a patient with CKD with an estimated glomerular filtration rate of <15 ml/min/1.73 m², end-stage renal disease is mentioned and renal replacement therapy is considered. There are three types of renal replacement therapy; peritoneal dialysis, hemodialysis, and kidney transplantation. In terms of patient survival and quality of life, kidney transplantation is the best form of renal replacement therapy (2 - 5). According to the latest registry report of the Turkish Society of Nephrology, as of the end of 2019, 22.9% of patients receiving renal replacement therapy in our country consist of kidney transplant patients (6).

The ability of an individual to perform health activities to maintain life, health, and well-being is called self-management power (7). Self-management power has been shown to be associated with better health outcomes in a variety of clinical situations (8 - 10). Jamieson et al. suggested in a review that improved self-management capacity could improve transplant outcomes (11). We think that the age of the patient, the number of chronic diseases and the number of drugs used, and the time elapsed after transplantation may affect the self-management power. We also think that kidney outcomes may be adversely affected if self-management power is reduced. In this sense, there is a need to determine the parameters that affect self-management power.

In this study, we aimed to investigate parameters affecting self-management power in kidney transplant recipients.

MATERIAL AND METHODS

Patients

All kidney transplant recipients (n=154) who applied to the nephrology outpatient clinic between July 2022 and September 2022 were interviewed for the study. The study was carried out with a total of 128 patients who volunteered to participate in the study. The demographic, clinical, and laboratory parameters of the patients were recorded. Being ≥ 18 years of age,

having a history of kidney transplantation, and having a sufficient level of education to fill out the questionnaire was determined as inclusion criteria. Being <18 years of age, not having enough education to fill out the questionnaire, and not wanting to participate in the study were taken as exclusion criteria from the study.

Assessment of Self-Management Power

The exercise of the self-care agency scale was used as a self-management power scale. This scale was first developed by Kearney and Fleischer in 1979 (12). Afterward, reliability and validity studies were also carried out in our country (13). The scale consists of 35 descriptive statements. Each statement is scored between 0 and 4 points, the maximum score is 140, while the minimum score is 35. In the evaluation of the scale, patients were evaluated by grouping them as "poor self-management", "moderate self-management", "good in self-management" and "very good in self-management" in some studies, while evaluation was made on raw scores in others (14 - 17). In this study, we evaluated the scale with raw scores.

Covariates

All continuous variables were checked for the relationship with self-management power. Variables that correlated with self-management power were taken as covariates for linear regression analysis. Age was calculated via current date minus date of birth and it was used as years. The number of chronic diseases was found by adding the diagnosed chronic diseases that the patient had. The number of drugs used was calculated by adding different types of drugs used in a day. The time elapsed after transplantation was calculated as the current date minus the date of transplantation, and it is used as months.

Ethical Committee

Ethics Committee approval was received at the Afyonkarahisar Health Sciences University Ethics Committee meeting dated 01.07.2022 (code of ethics committee: 2011-KAEK-2, meeting number: 2022/8, decision number: 358).

Statistical Analysis

SPSS 26.0 package program was used for statistical analysis. Categorical variables were pre-

sented as percentages and frequencies. The conformity of continuous variables to normal distribution was checked with the Shapiro-Wilk test. Normally distributed continuous variables were presented as mean±standart deviation. Non-normally distributed continuous variables were presented as the median and interquartile range (IQR) 25-75. First Pearson correlation analysis was done for determining the correlation between self-management power and other continuous variables. Age, number of drugs used, time after transplantation, and number of chronic diseases, which were found to be associated with self-management power in the correlation analysis, were included in the linear regression analysis. All p values are bidirectional and $p < 0.05$ is considered as statistically significant.

RESULTS

The study was conducted with a total of 128 patients, seventy (54.7%) male and 58 (45.3%) female. The mean age of the study population was 44.63 ± 13.5 years. The mean self-management power score was 112.86 ± 14.6 . While 101 (78.9%) of the patients had a history of transplantation from a living donor, twenty-seven (21.1%) had cadaveric transplantation. In terms of primary diseases causing kidney loss, diabetes mellitus was found to be the most common disease with 35.9% (n= 46). **Figure 1** shows the distribution of primary diseases that cause kidney loss.

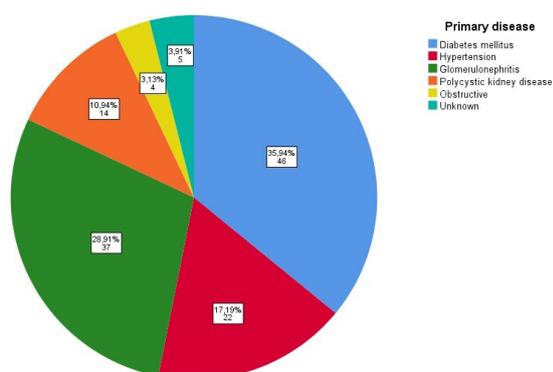


Figure 1: Distribution of the primary kidney diseases causing kidney loss

The median number of chronic diseases was 1 (IQR25-75= 1-2). Diabetes mellitus was found to be the most common comorbidity in our patients with a rate of 39.8% (n= 51). **Table 1** shows the comorbidities of the patients.

Table 1: Comorbidities of the patients

| Comorbidity | %-n |
|---------------------------|---------|
| Diabetes mellitus | 39.8-51 |
| Hypertension | 33.6-43 |
| Congestive heart failure | 3.9-5 |
| Chronic pulmonary disease | 2.3-3 |
| Hyperlipidemia | 42-32.8 |
| Coronary artery disease | 6.3-8 |

The median number of drugs used was 6 (IQR25-75= 6-7). **Table 2** shows the drugs used by the patients.

Table 2: Drugs used by the patients

| Drug | %-n |
|---|---------|
| Oral antidiabetics | 28.9-37 |
| Renin-angiotensin aldoesteron system inhibitors | 21.1-27 |
| Calcium channel blockers | 28.9-37 |
| Beta-blockers | 15.6-20 |
| Alpha-blockers | 7-9 |
| Diuretics | 12.5-16 |
| Anti-coagulants | 4.7-6 |
| Anti-aggregants | 20.3-26 |
| Calcineurin inhibitors | 93-119 |
| Mycophenolate mofetil | 5.5-7 |
| mTOR inhibitors | 76.6-98 |
| Steroids | 100-128 |
| Proton pump inhibitors | 100-128 |
| Vitamin D | 100-128 |

The laboratory parameters and self-management power scores of the patients are summarized in **Table 3**.

Table 3: Laboratory parameters and self-management power scores of the patients

| Parameter | |
|--|-------------|
| White blood cell ($\times 10^3/\mu\text{L}$) | 9.01±2.7 |
| Hemoglobin (g/dL) | 12.95±2.3 |
| Platelet ($\times 10^3/\mu\text{L}$) | 255.48±85.6 |
| Urea (mg/dL) | 53.08±10.51 |
| Creatinin (mg/dL) | 1.29±0.29 |
| Glomerularly filtration rate (ml/min/1.73 m ²) | 64.69±18.9 |
| Sodium (mEq/L) | 138.48±3.7 |
| Potassium (mEq/L) | 4.49±0.4 |
| Alanin-aminotransferase (U/L) | 20.23±22.8 |
| Self-management power | 112.86±14.6 |

The continuous variables that were found to be related to self-management power are presented in **Table 4**. **Figure 2** shows the correlation matrix of self-management power, age, number of drugs used, time after transplantation, and number of chronic diseases. **Table 5** shows the R^2 values of the parameters included in the linear regression analysis, one by one and all four together. Our linear regression model is summarized in **Table 6**. In our regression model, the strongest parameter affecting self-management power was found to be age. **Figure 3** shows the contribution of the covariates to the model.

Table 4: Pearson correlation analysis results between self management power and continuous parameters

| Parameter | Age | No. of drugs | Time after Tx | No. of chronic diseases |
|-----------------------|--------|--------------|---------------|-------------------------|
| Self-management score | | | | |
| r | -0.581 | -0.287 | -0.243 | -0.422 |
| p | <0.001 | 0.001 | 0.006 | <0.001 |
| Age | | | | |
| r | | 0.172 | 0.280 | 0.442 |
| p | | 0.053 | 0.001 | <0.001 |
| No. of drugs | | | | |
| r | | | -0.125 | 0.780 |
| p | | | 0.160 | 0.001 |
| Time after Tx | | | | |
| r | | | | 0.125 |
| p | | | | 0.269 |

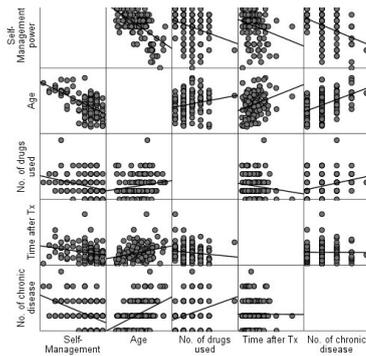


Figure 2: Correlation matrix of self-management power, age, number of drugs used, time after transplantation and number of chronic diseases

Table 5: R² values of covariates and multiple regression model

| Parameters | R ² |
|--|----------------|
| Age | 0.337 |
| No. of drugs used | 0.082 |
| Time after transplantation | 0.059 |
| No. of chronic diseases | 0.178 |
| Age+No. of drugs used+Time after transplantation+No. of chronic diseases | 0.413 |

Table 6: Multiple variable linear regression model for predicting self-management power

| Predictor | B | Standart error | p | 95% CI |
|----------------------------|---------|----------------|--------|-----------------|
| Intercept | 154.171 | 3.932 | <0.001 | 146.388/161.954 |
| Age | -0.287 | 0.055 | <0.001 | -0.396/-0.179 |
| No. of drugs used | -1.324 | 0.535 | 0.015 | -2.384/-0.264 |
| Time after transplantation | -0.020 | 0.010 | 0.049 | -0.039/0.001 |
| No. of chronic diseases | -1.826 | 0.796 | 0.023 | -3.401/-0.251 |

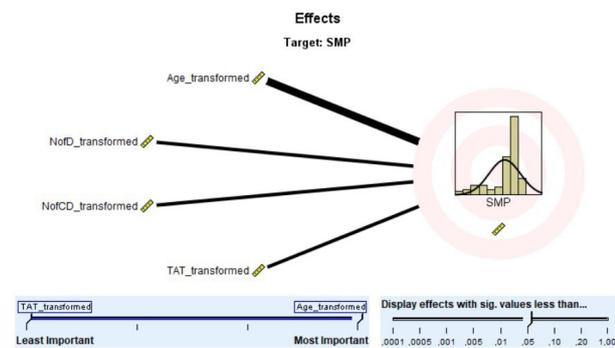


Figure 3: Contribution of the covariates to the model

DISCUSSION

Self-management skills of the recipient after kidney transplantation include taking immunosuppressive drugs, having knowledge of drug side effects, knowing methods of protection from infections, monitoring her/himself, and meeting with relevant specialists regularly (18-20). The patient's self-management power is considered valuable for maintaining health and minimizing CKD complications (21, 22). In our literature review, we could not find any study investigating the parameters that affect the self-management power in kidney transplant recipients. Our study shows that some factors such as; age, number of drugs used, time after transplantation, and number of chronic diseases may affect the patient's self-management power.

Since the chronic diseases of the patients will increase with age, the self-management power of the elderly individuals should be better, but in our study, it was determined that the self-management power decreased with aging. In fact, age was found to be the strongest factor in self-management power in our regression model. Cramm et al have shown that age influences poor health conditions (23). Studies showed that a decrease in physical activity and cognitive functions may lead to self-management problems in elderly patients (24, 25). Considering the increasing life expectancy, it seems certain that we will start to examine older kidney transplant recipients in the coming decades. It should be kept in mind that the power of self-management may decrease with aging and more frequent follow-up of elderly kidney transplant recipients may be considered.

The use of many drugs is common in the management of acute and chronic diseases. Demirbas et al. found that as the number of drugs used in the study increased, the scale of adherence to treatment decreased (26). Our study showed that the number of drugs used decreases self-management power. Polypharmacy should be considered in kidney transplant recipients and it should be considered that unnecessary drug use may lead to a decrease in self-management power.

Our study revealed that the patient's self-management power decreased as the time elapsed after transplantation increased. In a study conducted by Vankova et al., 211 kidney transplant patients were evaluated and it was found that although the compliance rates of the patients were not bad, the treatment compliance decreased as the time elapsed after the transplant increased (27). In the study of Demirbas et al., it was shown that as the duration of diagnosis of the disease increases, adherence to treatment decreases (26). We think that the decrease in the self-management power of our patients as the post-transplant time increases is due to the fact that there may be problems in their adaptation to drug use in the long term.

The current study revealed that as the number of comorbidities increases, there is a decrease in self-management power. There are many articles in the literature supporting this finding (28 - 30). While comorbidities can lead to a decrease in self-management power, they can also cause such a result with complications they cause. The increase in comorbid diseases also leads to an increase in the number of drugs that the patient should use, which may lead to a decrease in self-management power.

The two limitations of our study are that it was single-centered and the number of patients was small. However, our study is important because it is the first study to investigate the parameters affecting the self-management power in kidney transplant recipients.

In conclusion; There are some demographic and clinical factors that affect self-management power. Considering the scarcity of organ donations in our country, organ transplant recipients constitute a special patient group. Although success after kidney transplantation is usually attributed to the physician and the transplant unit, it should not be forgotten that the patient also plays an important role, especially in long-term kidney outcomes. There is a need for health policies that support the self-management power of kidney transplant recipients.

REFERENCES

1. Ammirati AL. Chronic Kidney Disease. *Rev Assoc Med Bras.* (1992). 2020;66:3-9.
2. Kang SH, Chung BH, Choi SR, et al. Comparison of clinical outcomes by different renal replacement therapy in patients with end-stage renal disease secondary to lupus nephritis. *Korean J Intern Med.* 2011;26(1):60-7.
3. Wolfe RA, Ashby VB, Milford EL, et al. Comparison of mortality in all patients on dialysis, patients on dialysis awaiting transplantation, and recipients of a first cadaveric transplant. *N Engl J Med.* 1999 ;341(23):1725-30.
4. Jansz TT, Bonenkamp AA, Boereboom FTJ, van Reekum FE, Verhaar MC, van Jaarsveld BC. Health-related quality of life compared between kidney transplantation and nocturnal hemodialysis. *PLoS One.* 2018;20;13(9):e0204405.
5. Tonelli M, Wiebe N, Knoll G, et al. Systematic review: kidney transplantation compared with dialysis in clinically relevant outcomes. *Am J Transplant.* 2011;11(10):2093-109.
6. Seyahi N, Ateş K, Süleymanlar G. Current Status of Renal Replacement Therapy in Turkey: A Summary of the 2019 Turkish Society and Nephrology Registry Report. *Turkish Journal of Nephrology.* 2021;30:105-11.
7. Lorig KR, Holman H. Self-management education: history, definition, outcomes, and mechanisms. *Ann Behav Med.* 2003;26(1):1-7.
8. Aminuddin HB, Jiao N, Jiang Y, et al. Effectiveness of smartphone-based self-management interventions on self-efficacy, self-care activities, health-related quality of life and clinical outcomes in patients with type 2 diabetes: A systematic review and meta-analysis. *Int J Nurs Stud.* 2021;116:103286.
9. Li R, Liang N, Bu F, Hesketh T. The Effectiveness of Self-Management of Hypertension in Adults Using Mobile Health: Systematic Review and Meta-Analysis. *JMIR Mhealth Uhealth.* 2020;27;8(3):e17776.
10. Lean M, Fornells-Ambrojo M, Milton A, et al. Self-management interventions for people with severe mental illness: systematic review and meta-analysis. *Br J Psychiatry.* 2019;214(5):260-8.
11. Jamieson NJ, Hanson CS, Josephson MA, et al. Motivations, Challenges, and Attitudes to Self-management in Kidney Transplant Recipients: A Systematic Review of Qualitative Studies. *Am J Kidney Dis.* 2016;67(3):461-78.
12. Kearney BY, Fleischer BJ. Development of an instrument to measure exercise of self-care agency. *Res Nurs Health.* 1979;2(1):25-34.
13. Nahcivan N. Sağlıklı gençlerde öz-bakım gücü ve aile ortamının etkisi. Doktora Tezi. İstanbul: İstanbul Üniversitesi Sağlık Bilimleri Enstitüsü, Hemşirelik Anabilim Dalı,1993.
14. Pınar R. Diyabetes Mellitus'lu hastaların yaşam kalitesi ve yaşam kalitesini etkileyen faktörlerin incelenmesi. Doktora Tezi. İstanbul: İstanbul Üniversitesi Sağlık Bilimleri Enstitüsü, Hemşirelik Anabilim Dalı, 1995.

- 15.** Bakoğlu E, Yetkin A. Hipertansiyonlu hastaların öz-bakım gücünün değerlendirilmesi. Cumhuriyet Üniversitesi Hemşirelik Yüksek Okulu Dergisi. 2000;4:41-9.
- 16.** Mollaoğlu M. Hemodiyaliz uygulanan hastalarda öz-bakım gücü ve depresyon. Nefroloji Hemşireliği Dergisi. 2005;2:55-60.
- 17.** Bakoğlu E, Şekerci K, Yaman S, Çevik M. Periton Diyalizli hastalarda Öz-Bakım Gücü. Fırat Sağlık Hizmetleri Dergisi. 2009;4:65-78.
- 18.** Akyolcu N. Patient education in renal transplantation. EDTNA ERCA J. 2002;28(4):176-9.
- 19.** Murphy F. The role of the nurse post-renal transplantation. Br J Nurs. 2007;16(11):667-75.
- 20.** Kobus G, Małyszko J, Małyszko JS, Puza E, Bachórzewska-Gajewska H, Myśliwiec M. Compliance with lifestyle recommendations in kidney allograft recipients. Transplant Proc. 2011;43(8):2930-4.
- 21.** Go AS, Chertow GM, Fan D, McCulloch CE, Hsu CY. Chronic kidney disease and the risks of death, cardiovascular events, and hospitalization. N Engl J Med. 2004;23;351(13):1296-305.
- 22.** Gill JS. Potential advantages and limitations of applying the chronic kidney disease classification to kidney transplant recipients. Am J Transplant. 2006;6(12):2821-6.
- 23.** Cramm JM, Twisk J, Nieboer AP. Self-management abilities and frailty are important for healthy aging among community-dwelling older people; a cross-sectional study. BMC Geriatr. 2014;14:28.
- 24.** Li PS, Hsieh CJ, Miao NF. A Study of Physical Activity, Frailty, and Health-Related Quality of Life Among Community-Dwelling Older Adults in Taiwan. J Nurs Res. 2020;28(6):e124.
- 25.** Davis JC, Bryan S, Li LC, et al. Mobility and cognition are associated with wellbeing and health related quality of life among older adults: a cross-sectional analysis of the Vancouver Falls Prevention Cohort. BMC Geriatr. 2015;5;15:75.
- 26.** Demirbas N, Kutlu R. Çoklu ilaç kullanan yetişkin bireylerin tedaviye uyumu ve öz-etkililik düzeyleri. Ankara Medical Journal. 2020(2):269-80.
- 27.** Vankova B, Mala-Ladova K, Kubena AA, Maly J, Sulikova SD. Immunosuppressive therapy related adherence, beliefs and self-management in kidney transplant outpatients. Patient Prefer Adherence. 2018;12:2605-13.
- 28.** Liddy C, Blazkho V, Mill K. Challenges of self-management when living with multiple chronic conditions: systematic review of the qualitative literature. Can Fam Physician. 2014;60(12):1123-33.
- 29.** Bayliss EA, Ellis JL, Steiner JF. Barriers to self-management and quality-of-life outcomes in seniors with multimorbidities. Ann Fam Med. 2007;5(5):395-402.
- 30.** Gobeil-Lavoie AP, Chouinard MC, Danish A, Hudon C. Characteristics of self-management among patients with complex health needs: a thematic analysis review. BMJ Open. 2019;24;9(5):e028344.