

Nonadherence Behaviors and Some Related Factors in Kidney Transplant Recipients

Abstract

Background: Kidney transplantation is the renal replacement therapy of choice for most patients with end-stage renal disease (ESRD), however, adherence to the recommended lifestyle is critical for a positive prognosis. The purpose of this study was to assess adherence to immunosuppressive therapy and lifestyle recommendations along with some related factors among kidney transplant patients. **Materials and Methods:** In this descriptive analytical study, all patients completed a questionnaire regarding medication intake and lifestyle recommendations (preventing of infection, self-monitoring, prevention of cardiovascular disease (CVD), and sun protection). The participants were divided into 4 groups according to the level of adherence (good, partial, poor, and nonadherent) indicated in their responses. **Results:** Most kidney recipients were adherent to their drug prescriptions, but were partial, poor, or nonadherent regarding lifestyle recommendations. Increased passage of time since transplantation and low family support and educational level resulted in nonadherence. Men showed greater adherence to medication intake than women. Patients with lower number of drugs and reported drug side-effects illustrated better adherence to medication intake. Women adhered to infection protection recommendations more than men, and older and married patients adhered to cardiovascular prevention recommendations more than others. However, younger patients showed greater adherence to self-monitoring recommendations, and singles, young individuals, and women were adherent to sun protection recommendations. **Conclusions:** Nonadherence is common among kidney transplant recipients. Thus, it is necessary to determine patients who are at risk of nonadherence and to introduce more educational programs to improve their adherence and their quality of life (QOL).

Keywords: Adherence, Iran, Kidney transplantation nursing

Introduction

Chronic kidney disease (CKD) is the cause of approximately 60 million deaths annually worldwide.^[1] Kidney transplantation is the preferred treatment for most patients with this disease.^[2] Studies have shown that, during the first 2 years after transplantation, 20–68% of the patients experience kidney transplant rejection.^[3] Today, the need for long-term use of immunosuppressive drugs to prevent transplant rejection has been confirmed.^[4] However, these medications cause complications such as different inflections,^[5] weight gain, and cardiovascular disease (CVD);^[6] these drugs also have adverse effects on the skin.^[7] To reduce these complications and to maintain the transplanted kidney, patients' adherence to the recommended lifestyle is essential.^[8] The World Health Organization (WHO) considers adherence as the correspondence

between the behavior of a patient and the medical team recommendations.^[8,9] These recommendations include taking medication, following the prescribed diet, and making lifestyle changes.^[10] Increased risk of transplant rejection with minimum diversion from the prescribed regimen,^[11] shortage of organ donors, long duration of remaining on the transplant waiting list, and the economic costs of dialysis render the need to follow the medical recommendations imperative.^[12] Therefore, patients are trained before being discharged from the hospital regarding the new lifestyle, including follow-up visits, prevention of infection, diet, use of immunosuppressive therapy, physical activity, recording self-monitoring, and sun protection items.^[13] Various studies have shown that patients who undergo kidney transplantation do not follow these recommendations accurately;^[13,14] therefore, it is essential

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that health care providers, especially nurses, pay particular attention to this issue. Adherence to recommended lifestyle is affected by various factors including socioeconomic factors along with those related to treatment.^[15] Nurses, in addition to identifying nonadherence in patients, have an important role in identifying its risk factors and creating ways to support these patients.^[14]

Available sources indicate that the adherence of patients who have undergone kidney transplantation to the treatment regimen and factors affecting it have not been studied in Iran. Therefore, this study aimed to determine patients' manner of adherence to kidney transplantation regimens and factors affecting it.

Materials and Methods

This was a descriptive analytical study conducted in 2014. The study population included kidney transplant recipients who referred to the Hazrat Abolfazl Charity Center in Isfahan, Iran. The participants were 183 patients randomly selected among kidney transplantation patients who were older than 18 years, for whom at least 3 months had passed since their transplant, who lived with their families, had no problem in obtaining the medication, had the ability to understand and speak Persian language, and did not have mental retardation. After explaining the purpose of the study to the patients and obtaining their consent, the questionnaires were completed. Patients who did not respond fully to the questions were excluded. Finally, statistical analysis was performed on 170 patients. The data collection tool was a 3-part, researcher-made questionnaire. The first part contained 13 questions regarding demographic characteristics, the second part consisted of 10 questions regarding information about the disease and treatment, and the third part contained 54 questions in relation to the adherence of patients to medical prescriptions, infection control, monitoring signs of rejection, and the prevention of CVD and skin cancer. Each question of the third part was scored on a 5-point scale ranging from 0 to 4. The number 4 represented the best state and 0 represented the worst state. The total scores ranged from 0 to 216. To analyze the data, the obtained scores of patients in each part were converted into a number between 0 and 100 using mathematical proportion, and then, the adherence of the patients was determined according to this score. In every part, obtaining scores of 96–100 showed good adherence, 71–95 partial adherence, 51–70 poor adherence, and less than 50 showed nonadherence. To determine the content and face validity of the questionnaire, it was given to 7 professors of the School of Nursing and Midwifery, Isfahan University of Medical Sciences, Iran, and 3 nephrologists. The reliability of the questionnaire was confirmed through test–retest on 10 patients, with an interval of 4 weeks between the two tests, correlation coefficient of 91%, and Cronbach's alpha of 77%, and these patients were excluded from the sample list. The data obtained by the questionnaire were

quantitative and qualitative data. For data analysis, all the information obtained from the questionnaires were initially coded and analyzed using the Statistical Package for the Social Sciences software (version 20, SPSS Inc., Chicago, IL, USA) using descriptive and inferential statistics (mean, standard deviation, and frequency), Pearson correlation coefficient, Spearman's correlation coefficient, independent *t*-test, and one-way analysis of variance. In this study, $P < 0.05$ was considered to be significant.

Ethical considerations

The participants were informed of the goals of the study and signed a written informed consent. The research project has been approved by the ethics committee of Isfahan University of Medical Sciences.

Results

The results of the study showed that the mean age of the participants was 40.2 ± 12 . The majority of the participants were men (55.3%), 67.6% were married, and they were all covered by insurance. The mean duration of the time passed since the transplantation was 5.21 ± 3.67 years, the mean number of medications used in 24 hours was 13.74 ± 4.57 , and the mean number of the side-effects reported was 2.42 ± 1.57 . Sixty nine patients (40.6%) reported an effective family support. Participants reported their education level as high school or university (47.7%), elementary (44.1%), and illiterate (8.2%).

A total of 99 out of 170 patients showed good adherence to medications intake and others were partially adherent. Men constituted the majority of patients with good adherence (58%). These patients also used fewer medications, reported fewer side-effects, a shorter duration had passed since their transplant, had higher education level, and received stronger family support.

Most patients (78.8%) had partial adherence to the prevention of infection. In cases of avoidance of public transportation use, contact with patients with infections and crowded places, and tooth brushing, good adherence was observed in 8.8, 16.5, 5.9, and 2.4% of cases, respectively. Women's performance in the prevention of infection was better than men.

The majority of the participants (79.4%) did not have transplant rejection symptoms. Moreover, 93.5% of the patients had timely attendance in outpatient clinics, and 84.7% underwent renal function control experiment. Less than 10% of the participants with transplant rejection symptoms controlled rejection symptoms through measurement of weight and daily fluid intake and output, body temperature, and feeling the transplant area. Patient adherence was inversely correlated with age.

The adherence of patients to the prevention of CVD was relative, and none of the participants consumed drugs or alcohol. In addition, 11 patients smoked before the

transplant and 8 patients quit smoking after the transplant. Half of the patients followed the diet, however, only 11.2% performed regular exercise. Among the patients, 41.2% had excess weight (Body mass index (BMI) = 25–29.9 kg/m²) and 8.2% were obese (BMI >30 kg/m²). The adherence of older patients and married participants to CVD prevention was better than other patients.

Most participants (62.4%) did not follow the treatment recommendations regarding the prevention of skin cancer; only 21.2% used sunscreen and less than 9% used hats and gloves for sun protection. However, 70.6% wore covered clothing when leaving the house. Patients' adherence to this dimension of the treatment was inversely related with age. Single patients had better adherence compared to married patients.

Table 1 demonstrates the patients' adherence to each of the dimensions of recommended lifestyle.

In all dimensions of the recommended lifestyle, there was a direct relationship between participant's adherence and levels of education and family support, however, as more time passed after the transplant, adherence decreased.

Discussion

After kidney transplantation, adherence to lifestyle recommendations (taking medication, preventing of infection, self-monitoring of rejection signs, referring to outpatient clinics, healthy eating, physical exercise, and sun protection) is critical for a positive prognosis. Complications caused by nonadherence among these patients leads to increased rates of mortality.^[16] Nonadherence of patients to immunosuppressive drugs was the cause of approximately 15–60% of transplant rejections.^[17] The results showed that most patients had good adherence to taking medication and various studies have confirmed these findings.^[4,13,15,18] Patients adherence in this study was higher than that reported in the study by Shabany Hamedan *et al.*,^[19] which might be due to increased awareness of the patients regarding the importance of taking certain medications. Patients' adherence was affected by various factors.^[15] Men's adherence to medication use was better than that of

women.^[4,14,17] This finding was also confirmed in this study since women often do not take their medications due to the side effects.^[20] Similar to the findings of Denhaerynck *et al.*, it was found that married patients had better adherence to medication use compared to single patients.^[21] Patients who used more medication had lower adherence to using drugs. This result was consistent with the studies by Morales *et al.*^[22] and McCune.^[17] Therefore, fewer medications with higher efficacy should be used. The results also showed that individuals who observed more side effects had lower adherence to medication use. The results of the study by Shellmer *et al.* also confirmed this finding.^[9]

However, Prihodova *et al.* reported a higher number of side effects in patients with greater adherence. Patients who used medication observed better performance of the transplanted organ, and despite experiencing side effects, they still used the medications.^[18] Therefore, educating the patients about the side effects as well as the importance of using drugs, despite the complications that are not life-threatening, is necessary. The results of the present study indicated that the patients who were greatly supported by their family compared to other patients had good adherence to using medications, which is in agreement with other studies.^[10,18] Family support could provide benefits for the patients which friends' support could not.^[12] Another finding of this study was that low level of education was associated with reduced medication compliance, which was similar to the findings of Prihodova *et al.*^[18] The results of the study by Gheith *et al.* indicated that adherence was not associated with education level.^[14] Medication adherence of patients in this study was not associated with age and income. The lack of effect of age on the adherence of patients to medication might be due to the fact that all the patients in this study were over 18 years of age and children and adolescents were not included in the study.

Prevention of infection was another component of the treatment regimen for these patients.^[23] The results of the present study showed that the patients had partial adherence to infection prevention. This finding was similar to that of Gheith *et al.*^[14] As more time had passed since the transplant, the adherence of patients to infection prevention significantly decreased. This result could be due to the lack of continuing education in these patients. Germani *et al.* stated that, except in the use of immunosuppressive drugs, women followed the lifestyle changes better, such as the prevention of infection, compared to men.^[4] The results of the present study also showed that women had significantly better adherence to the prevention of infection compared to men.

The easiest way to examine the transplanted kidney is to perform renal function tests, recording transplant rejection signs, and referring to outpatient clinics when necessary.^[13] The results showed that most patients visited the clinics based on schedules, and renal function tests

Table 1: Distribution of kidney transplant recipients according to level of adherence

Parameters	Patients' level of adherence, n (%)			
	Good	Partial	Poor	Nonadherent
Medication	99 (58.3)	71 (41.7)	0	0
Prevention of infection	3 (1.8)	155 (91.1)	12 (7.1)	0
Self-monitoring	0	2 (1.2)	33 (19.4)	135 (79.4)
Prevention of cardiovascular disease	0	134 (78.8)	36 (21.2)	0
Sun protection	0	16 (9.4)	48 (28.2)	106 (62.4)
Total score (%)	0	42.90	51.70	0

were performed; this result was similar to the study by Germani *et al.*^[4] Similar to the results of the study by Kobus *et al.*, only a few of the symptoms of rejection were recorded.^[13] In general, the patients did not show adherence to transplant rejection symptoms monitoring, and this was consistent with the results of the study by Gheith *et al.*^[14] The results also indicated that younger patients' adherence to the transplant rejection symptoms monitoring was better compared to other patients, however, monitoring of transplant rejection symptoms was not significantly associated with other features. The lower adherence of the elderly was due to problems such as forgetfulness, less ability to learn, greater impact of the disease on their bodies, transportation difficulties for going to the clinic, and low life expectancy.

According to the Organ Transplant Union, approximately 50% of the patients were obese^[6] because immunosuppressive drugs are associated with the risk of obesity and CVD.^[23] The results showed that approximately half of the patients were obese or were overweight, and this was similar to the findings of Kobus *et al.*^[13] For the prevention of CVDs, diet and exercise is recommended.^[23] Half of the participants in this study were observed to comply with the recommended diet, and this result was similar to the results obtained in the studies by Dew *et al.*^[24] and Gheith *et al.*^[14] In the prevention of CVD and following the recommended diet, the elderly and married patients had better adherence compared to the young and single patients. Single and young individuals consume more fast food; however, family monitoring, particularly by the spouse, was effective in consuming appropriate food according to dietary recommendations. Older patients were more accustomed to diets due to chronic diseases such as diabetes. The results showed that a small percentage of patients engaged in regular exercise, which was consistent with the results of Gheith *et al.*;^[14] this shows the importance of greater attention to this issue. Low rate of sports activities in the present study can be attributed to the low per capita of sporting activities among Iranians. For the prevention of CVDs, lack of smoking and alcohol consumption is necessary.^[25] The results of the present study showed that none of the participants consumed alcohol and the smoking rates were very low in these patients. The results of the study by Dew *et al.* also showed low levels of consumption of alcohol and cigarettes in patients who had undergone kidney transplantation.^[24]

Skin protection against the sun is essential for patients due to the side effects of immunosuppressive therapy.^[7] The study findings indicated that the patients did not comply with this dimension, and this result was consistent with that of the studies by Gheith *et al.*^[14] and Firooz *et al.*^[26] Ulrich *et al.* stated that one reason for the nonadherence of patients was economic problems.^[27] The results of the present study showed no significant relationship between income and patients adherence to sun protection. The

least amount of training can also be effective because patients who receive systematic training in this respect have better compliance than other patients.^[28] Regarding sun protection, single and young patients had significantly better adherence, which was consistent with the results of the study by Gheith *et al.*^[14] This could be due to younger patients' greater attention to their appearance.^[14] The results also showed that women's adherence to using sunscreens was significantly better than men. This finding was similar to that of Gheith *et al.*^[14] and Kobus *et al.*^[13] The lower rate of adherence among men to sunscreen use was because of the whitening effect of these creams and the difficulty of rubbing it on the skin due to having a beard.^[25]

The results of the study showed that, as more time passed after the transplant, adherence to the different dimensions of recommended lifestyle decreased, and this finding is consistent with other studies.^[4,17,29] This could be related to the mental state of the patients, achieving self-control in managing the symptoms,^[4] and patients becoming tired because of the long-term adherence to the diet plan.^[29]

The study of adherence of patients using self-reported method was one of the limitations of this study. It is suggested that further research be conducted on the adherence of patients who have undergone organ transplantation through methods such as studying the blood levels of immunosuppressive drugs or parental monitoring. Studies on the comparison of adherence to treatment regimen in patients who have undergone kidney transplantation and other organ transplantations are also recommended.

Conclusion

The results of this study indicated that patients' adherence to recommended lifestyle was poor. Furthermore, the adherence of patients to each dimension of the treatment was associated with certain demographic characteristics and treatment features such as time passed since the transplant, levels of education, family support, marital status, and gender of the patients. Considering the importance of patients' adherence to the recommended lifestyle, it is necessary that all patients, especially patients at risk of no-adherence, be trained regarding post-transplant issues in order to prevent the complications of nonadherence and the patients' return to the dialysis cycle, as well as to improve patients' quality of life.

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Conflicts of interest

There are no conflicts of interest.

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