

ORIGINAL ARTICLE

The Effect of Teach-Back Training on Self Management in Kidney Transplant Recipients: A Clinical Trial

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ABSTRACT

Background: Kidney transplant recipients need self-management during their lifetime, and training these patients is essential for the realization of self-management. Teach-back training (TBT) was used to receive, understand, and retain information. This study aimed to determine the effect of TBT on self-management in kidney transplant recipients.

Methods: In this clinical trial study, 84 kidney transplant recipients who referred to the clinic of Imam Khomeini Hospital in Urmia (a city in northwest of Iran), from January to March 2017, were selected through convenience sampling and randomly assigned to intervention and control groups. In the intervention group, educational content was presented for each patient with TBT in 5 sessions of 60 minutes. Data were collected before and after the intervention by a special Self-Management Questionnaire for Kidney Transplant Recipients in five areas as follows: self-monitoring, self-care behavior in daily living, early detecting and coping with abnormalities after kidney transplantation, stress management and the category of non-categorized area. This is a valid and reliable questionnaire ($\alpha=0.76$). Collected data were analyzed by independent t-test and Mann-Whitney test. Statistical analysis was performed using SPSS 20 and $P \leq 0.05$ was considered as significant.

Results: Independent t-test showed that the mean of self-management score between the control and intervention groups was not statistically significant before the intervention ($P=0.90$). The mean score of self-management increased after implementation of TBT in the intervention group compared to the control group, and the difference was statistically significant ($P=0.001$).

Conclusion: The implementation of TBT method is effective in promoting self-management of kidney transplant recipients. Therefore, it is recommended that this method should be used to train the patients to better understand the components of self-management.

Trial Registration Number: IRCT2016122817059N10

KEYWORDS: Kidney transplantation, Nursing, Self management, Teach back communication

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INTRODUCTION

The most important event to which the communities and healthcare staff are faced in the 21st century is the increasing incidence of chronic diseases,¹ among which End Stage Renal Disease (ESRD) is known as a global problem.² The prevalence rate of renal failure in the world is around 15%.³ According to available statistics, more than 24,000 people in Iran suffer from chronic renal failure, of which 48.5% are kidney transplant recipients.⁴

For most patients, kidney transplantation means a return to healthy life with a change in lifestyle. Kidney transplant recipients need constant monitoring through their lifetime. Medical and self-management follow-ups are essential for these patients. Self-management in kidney transplant patients, like other chronic diseases, includes managing the diet, emotions, and new life roles.⁵ People with kidney transplantation need self-management in the cases, such as receiving immunosuppressive drugs, infection prevention, self-control, physical activity, and nutrition management that are essential for health.⁶ Knowledge, skills and emotional support of the kidney transplant recipients is necessary to promote their self-management.^{7,8}

Kidney transplantation as a complex process requires training programs.⁵ Training of kidney transplant patients is a complex process involving a series of training activities to change the patient's behavior. Kidney transplant patients should learn new life skills, including control of vital signs, symptoms of the disease, and medication.^{9,10} The barriers to training kidney transplant patients is insufficient time to educate the patients during discharge, the complexity of educational issues, communication barriers, cultural differences, and the lack of repetition of educational concepts.¹¹ It should be considered that about 40 to 80 percent of the medical information given to patients is forgotten, and about half of the information remaining in the patient's memory is not correct.¹²

Teach-back training (TBT) is one of the effective ways to improve instructional training and promote the impact of education. This is a comprehensive, multidimensional and evidence-based approach used to receive and understand information.^{13,14} TBT method is an interactive method for education, through which the learner must be able to attain some command and ability to the extent that he/she is able to attend the art of teaching the lessons and skills learned. This method is used to eliminate the communication gap between health care providers and clients.^{13,15} The purpose of the TBT is to provide education consistent with the level of the education of the learner.¹⁶ According to the National Quality Forum, TBT method is one of 34 safe methods for training, so implementation of this method in the patient discharge program can reduce the incidence of self-management errors.¹⁷ One of the benefits of this approach is involving the patients in the learning process that supports patient-based care.^{14,18} Conducting self-management programs after kidney transplantation in most cases is limited to the use of educational pamphlets, and most programs focus on participation of patients in social support groups. Providing training in disease prevention, diet, cancer screenings and behavioral interventions for promoting medication to enhance well-being is necessary for these patients.^{19,20}

The major contribution of the care of kidney transplantation patients lies in the patients themselves. The importance of paying attention to the quality of training these people is essential in their care, and considering the complexity of the care plan for the kidney transplant recipients, there is a need to understand the patients better and more. The slightest error in their care can have harmful consequences. Therefore, the present study aimed to determine the effect of TBT on self management in kidney transplant recipients.

MATERIALS AND METHODS

This study is a clinical trial conducted during

January to March 2017. In this study, 84 kidney transplant recipients who referred to the special clinic of kidney transplantation, with about 40 referred patients per day for follow-up and medication adjustments in Imam Khomeini Hospital in Urmia, a city in the northwest of Iran were selected through convenient sampling, after obtaining written consent. The sample size was estimated considering a similar study by Oshvandi et al., reporting a mean score in the intervention group of 9.1 ± 3.2 and in the control group of 7.2 ± 2.6 .²¹ Then, the samples were randomly assigned to control and intervention groups using sealed envelope technique based on the types of cards A and B located in the envelope; in this way, the person who chose Card A was placed in the control group and those who chose Card B were placed in the intervention group. The research team and participants were blind to the result. The sample size was decided to include 36 people in each group according to the formula:

$$n = \frac{(Z_{\alpha/2} + Z_{1-\beta})^2 \times (S_1^2 + S_2^2)}{(\bar{x}_1 - \bar{x}_2)^2}$$

and also the study of Oshvandi et al. with dropout rate of 15%, statistical power of 80%, $\alpha=0.05$; the sample size for each group was calculated 42 people. It should be noted that in the control group, five samples did not complete the questionnaires at the end of the study. Post-test was performed 2 months after the intervention.

Inclusion criteria were a minimum age of 18 and maximum of 60, having reading and writing skills, minimum three months passed from kidney transplant up to 12 months, lack of severe infectious or debilitating diseases, having a telephone number to communicate, and no attendance in other classes and educational programs in the field of kidney transplantation during the study. Exclusion criteria included a minimum of two session absences and kidney transplant rejection throughout the study. In this research, a demographic information questionnaire and a Self-Management Scale for Kidney Transplant Recipients were used. Data on

gender, marriage, education, occupation, residence, income information were obtained using the demographic questionnaire.

Self-Management Scale for Kidney Transplant Recipients is a special tool for kidney transplant recipients developed by Kosaka et al. in 2013 that assesses the self-management of these patients considering concerns and issues specific to kidney transplant recipients.⁷ The questionnaire, with 24 questions, evaluates the self-management of kidney transplant patients in five domains. The items were responded through a 4-point Likert scale ranging from “not applied” to “strongly disagree”. The total scores for each domain were as follows: self-monitoring from 6 to 24, self-care behavior in daily living from 7 to 28, early detecting and coping with abnormalities after kidney transplantation from 4 to 16, stress management from 3 to 12, and the category of non-categorized questions from 4 to 16. Then, the total score of all fields was summed and the final score was obtained for the whole questionnaire. Therefore, the range of grades in this test is between 24 and 96, with a score of 24 indicating the lowest level of self-management and a score of 96 representing the highest level of self-management. In this study, the classification of grades was not considered and the mean scores were taken into account.

In the study of Kosaka et al., item internal consistency was from 0.38 to 0.79 and the item/scale discriminatory validity was satisfactory. The reliability of each dimension of Self-Management Scale for Kidney Transplant Recipients using Cronbach's alpha was between 0.61 to 0.87 and the intra-class correlation coefficients for each factor in the test-retest examination ranged from 0.86 to 0.95.⁷ In this study, this valid and reliable questionnaire was used after translation using forward and backward method. For confirmation of the content validity, the questionnaire was given to 10 professors from Urmia University of Medical Sciences, and after applying their comments, the final version was prepared. In the present

study, the reliability of the questionnaire was determined 0.76 by Cronbach’s alpha.

The information about the participants was completely confidential; the questionnaires were anonymous, and there was no potential risk for the participants in the study. The researcher explained the causes of the research and the research objectives, the voluntary nature of participation in the study and the possibility of withdrawal in the case of willingness for all participants.

Educational content was implemented with TBT method for each patient in the intervention group in at least 5 sessions of 60 minutes. It should be noted that the training was conducted individually. At the first session, each patient was evaluated using self-management educational needs checklist and targeted according to his/her needs. The second session was patient education based on self-monitoring and self-care behavior in daily living; the third session was on early detecting and coping with abnormalities after kidney transplantation; and the fourth session was on stress management and non-categorized cases. In the fifth session, the lessons focused on the subjects that the patient did not well understand. The transmission of the concepts was simple, transparent, and by emphasizing

the key points and repeating them using short sentences. The patient was then asked to express what was described in his or her own words so that we could make sure she/he understood. The researchers evaluated the cases not understood by the patient, and if the client cited more than 75% of the correct answers, it meant that the training was effective; otherwise, the process of repeating the material continued. These training sessions were conducted for three months.

This clinical trial was approved by the Center for Clinical Trials Registration and Ethics Committee of Urmia University of Medical Sciences in northwestern Iran (Ethical code IR.umsu.rec.1395.236). The control and intervention groups completed the self-management questionnaire again 2 months after the intervention. Statistical analysis was performed using SPSS 20, and Chi-square, independent t-test and Mann-Whitney tests and $P \leq 0.05$ was measured as significant (Figure 1).

RESULTS

Chi-square test showed no significant differences between the control and intervention groups in terms of demographic characteristics of gender,

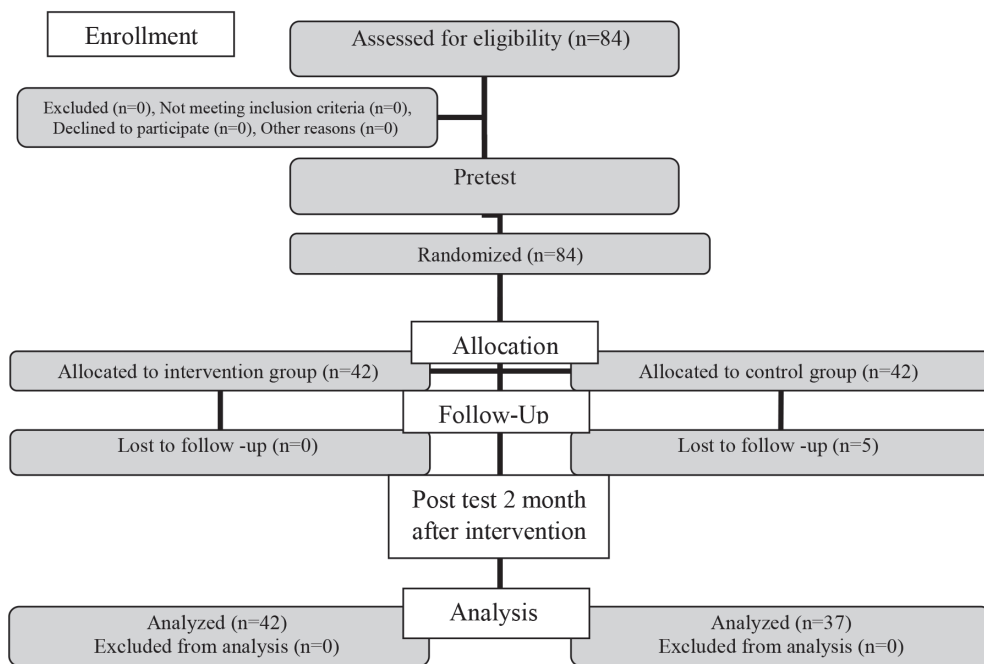


Figure 1: CONSORT flow diagram of the participants

marriage, education, occupation, residence and income ($P>0.05$) (Table 1).

Independent t-test showed no significant differences between the control and intervention groups regarding the demographic characteristics of age, the number of children, duration of transplantation, body mass index, and creatinine level ($P>0.05$) (Table 2).

Independent t-test showed that the mean score of self-management in the control and intervention groups was not significantly different before the intervention. The mean score of self-management after the implementation of the TBT program in the intervention group compared with the control group increased, which was statistically

significant. Paired t-test showed that the mean score of self-management in the intervention group was significantly different before and after the intervention ($P<0.05$) (Table 3).

Since some self-care dimensions (self-care behavior in daily living, stress management, non-categorized cases) did not have a normal distribution, Mann-Whitney test was used for comparing the mean scores them between the control and intervention groups. Independent t-test and Mann-Whitney showed that before the intervention, the mean scores of self-monitoring, self-care behavior in daily living, early detecting and coping with abnormalities after kidney transplantation, stress management, and non-categorized

Table 1: Comparison of qualitative demographic characteristics between the control and intervention groups

Variable		Control group	Intervention group	P value*
		(N=37)	(N=42)	
		N (%)	N (%)	
Gender	Male	25(67.6)	28(66.7)	P=0.93
	Female	12(32.4)	14(33.3)	
Marriage	Single	5(13.5)	11(26.2)	P=0.30
	Married	32(86.5)	31(73.8)	
Education	Primary	8(21.6)	3(7.1)	P=0.30
	High school	20(54.1)	20(47.6)	
	Diploma	4(10.8)	13(31)	
	Academic	5(13.5)	6(14.3)	
Occupation	Employed	6(16.2)	10(23.8)	P=0.23
	Housewife	11(29.7)	11(26.2)	
	Retired	4(10.8)	11(26.2)	
	Unemployed	14(37.8)	8(19)	
	Other	2(5.4)	2(4.8)	
Residence	Urban	25(67.6)	36(85.7)	P=0.05
	Rural	12(32.4)	6(14.3)	
Income	Low	22(59.5)	25(59.5)	P=0.82
	Average	9(24.3)	12(28.6)	
	High	6(16.2)	5(11.9)	

*Chi-square

Table 2: Comparison of demographic characteristics between the control and intervention groups

Variable	Control group	Intervention group	P value*
	(N=42)	(N=37)	
	Mean±SD	Mean±SD	
Age (year)	41.27±11.70	38±12.38	0.23
The number of children	2.18±1.95	1.50±1.40	0.12
Duration of transplantation (month)	5.91±2.61	7.16±3.53	0.13
Body Mass Index(kg.m ²)	26.49±3.82	25.41±4.01	0.23
Creatinine (mg.dL)	1.35±0.31	1.33±0.36	0.75

*Independent t-test

Table 3: Comparison of the mean score of self-management before and after training by TBT method between the control and intervention groups

Self-management score (24-96)	Control group (N=37)	Intervention group (N=42)	P value*
	Mean±SD	Mean±SD	
Before the intervention	74.83±9.26	75.07±8.09	t=-0.12 df=77 P=0.90
After the intervention	74.40±10.07	82.45±10.49	t=-3.46 df=77 P=0.001
P value**	T=-0.27 df=36 P=0.78	T=-3.64 df=41 P=0.001	-

*Independent t-test; **paired t-test

cases were not statistically significant between the control and intervention groups ($P>0.05$). However, the mean scores of the mentioned dimensions increased after the intervention in the intervention group compared to the control group, which was statistically significant ($P<0.05$) (Table 4).

DISCUSSION

The aim of this study was to determine the effect of TBT on self-management in kidney transplant recipients. The results of this study showed that the mean self-management score and its dimensions after the implementation of TBT method in the intervention group increased compared to the control group and this increase was statistically significant. Therefore, it could be concluded that using the educational content

of the TBT method can be presented to these patients according to their needs and based on the individuals and positive outcomes, and positive results can be obtained from the training.

In an investigation, the researcher used TBT method to teach the nurses and simulated this method to educate kidney transplant patients. The researcher concluded that after kidney transplantation surgery, TBT can improve the recovery, nutrition, fluid intake, food safety, hygiene, surgical care, prescribed medication, and control of vital signs, and can be effective in designing community-based education.¹³ In the present study, The TBT method was performed directly in kidney transplant patients and acceptable implications were obtained in all aspects of self-management in these patients. In a further interventional study, the researchers

Table 4: Comparison of the mean scores of self-management dimensions before and after the educational intervention between the control and intervention groups

Self-management dimensions		Control group	Intervention group	P value
		Mean±SD	Mean±SD	
Before the intervention	Self-monitoring (6-24)	13.67±4.15	13.69±3.58	*P=0.98
	Self-care behavior in daily living (7-28)	26.08±2.07	25.80±3.14	**P=0.52
	Early detecting and coping with abnormalities after kidney transplantation (4-16)	11.27±3.07	12.09±3.09	*P=0.23
	Stress management (3-12)	8.83±1.55	8.66±2.17	**P=0.74
	Non-categorized cases(4-16)	14.97±1.83	14.80±2.76	**P=0.48
After the intervention	Self-monitoring (6-24)	13.72±4.94	16.19±4.04	*P=0.01
	Self-care behavior in daily living (7-28)	25.48±2.66	26.73±3.67	**P=0.0001
	Early detecting and coping with abnormalities after kidney transplantation (4-16)	11.62±2.92	14.28±2.50	*P=0.0001
	Stress management (3-12)	9±1.73	9.83±2.33	**P=0.01
	Non- categorized cases (4-16)	14.75±1.46	15.40±2.06	**P=0.001

*Independent t-test; **Mann-Whitney

used the TBT method to directly teach the nurses the self-management content for heart and concluded that TBT method is an effective way to teach the self-care content related to heart failure to nurses. The purpose of practicing this method with nurses was to educate them how to teach the self-care content related to heart failure with TBT method to patients with heart failure. This was because it provides the opportunity to repeat the mentioned statements, and this repetition allows the trainer to repeat things that are not well understood by the learner, so that they are understood well by the learner;²² this is consistent with the results of the present study.

Likewise, in a different study, the use of TBT method increased the knowledge of management of hypertension in hypertensive patients in the intervention group. In this study, both groups received an educational booklet which was taught in the intervention group using TBT method, and the control group received only the educational booklet; however, in the present study, the control group did not receive any educational content.²³ In another study, the effect of TBT method on successful transfer of patients from hospital to home was studied with a clearance-process improvement approach and concluded that the use of TBT method can be effective in conveying information on the contents that the patient should handle at home.¹⁸ Since the majority of patient education in these two studies was related to self-care, the results were consistent with the present study.

According to the results of another study on the effect of the BT method on self-care behaviors in type 2 diabetic patients, the overall self-care scores of patients and the mean scores of self-care dimensions (diet, physical activity, foot care and regular use of medications) increased compared to those before the intervention.²¹ It was statistically significant and consistent with the results of the present study; in the present study, improvement in both overall self-management mean and the dimensions of self-management

were observed. Moreover, the results of another study showed that using feedback-based training on self-care in patients with heart failure resulted in a significant difference between the intervention and control groups after the intervention in the mean self-care score;²⁴ this is consistent with the results of the present study. In this study, as well as the present study, first, the educational needs of patients were assessed, and the patients were trained according to their needs. An investigation in Iran showed that the stress and anxiety levels after using TBT method, in the anxiety caused by cesarean section, in the control and intervention groups had a significant difference, and the mean stress management index in the intervention group was significantly higher than the control group.²⁵ Also, in the present study, this method had a positive and significant effect on the mental dimension of patients. Therefore, this method has been effective in controlling stress and anxiety. In a systematic review about the effect of TBT method on adherence to treatment and self-care in people with chronic illness, it was concluded that TBT had a positive effect on a wide range of self-care outcomes. Among these items, improvement of knowledge about their illness, adherence to treatment, and self-efficacy could be cited, and the method has been effective in reducing re-hospitalization, but there was little evidence of improvement in the quality of life.²⁶ According to the results of another study, the implementation of TBT method would increase the average scores in the quality of life in patients with heart failure, but this increase was not statistically significant.²⁷ However, in the present study, the mean increase in self-management was statistically significant. It can be said that the lack of a favorable outcomes from heart failure patients study was due to lack of evaluating the educational needs of patients at the beginning of the study, the lower size of the sample (n=30), and lack of the control group for comparison, whereas in the present study 84 patients were divided into two groups

of control and intervention. In addition, a study showed that patients with kidney transplantation showed more satisfaction when monitored by a physician for creatinine level and blood pressure.¹⁰ Therefore, kidney transplantation patients have a great need for monitoring their blood pressure and creatinine. Some patients had better monitoring of their blood pressure and its fluctuations with home blood pressure monitoring, and others took control of their blood pressure by the TBT method. Implementation of the TBT method improved the mean self-management of kidney transplantation patients in all its dimensions including self-monitoring, self-care behavior in daily living, early detecting and coping with abnormalities after kidney transplantation, stress management, and finally non-categorized dimension. In addition, patients were significantly improved on these dimensions; therefore, this method is an effective method for self-care education for these patients.

The follow up period for patients in this study was two months. The short-term nature of the study was one of the limitations of this study. It is suggested that a study in this field should be conducted with a follow-up period of more than two months to measure the durability of the effect of TBT on self-management of kidney recipients. Patients' psychological conditions during the control of the questionnaire were likely to affect the data of the study, so there was an attempt to fill out the questionnaire in a relaxed and quiet environment.

As the strength of this study, it was found that low-cost and accessible teach-back training has potential benefits in providing more effective education along with the routine education.

CONCLUSION

Considering the findings of this study, we recommend that TBT is effective in improvement of self-management in kidney transplant recipients such as the patient's

physical, mental, and nutritional affairs. Therefore, it is suggested that TBT should be used to promote self-management in kidney transplant recipients. By making patients familiar with the TBT method, it is possible to implement the steps and processes of TBT and enjoy the positive feedback mentioned; this has a direct impact on the improvement of patient's self-management. The authorities should also take measures to facilitate the training of these patients in ways that it results in positive outcomes. Also, further researches in the future are needed to be conducted with larger sample size and multicenter studies to obtain more evidence in effectiveness of TBT in improvement of self-management in kidney transplant recipients.

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Conflict of Interest: None declared.

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