

# Investigation of the Effect of Jig-Saw Training on Care Burden of the Main Caregiver of Patients Undergoing Renal Transplantation Surgery

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## Abstract—

**Background:** Chronic diseases, including renal patients, bring a lot of psychological, social and economic burden to the family and the patient's primary caregiver. Therefore, some interventions such as education can have a significant effect on reducing the burden of care in caregivers. One of the educational methods is participatory learning, which is considered to be a jig-saw model. The aim of this study was to investigate the effect of Jig-Saw's training on the caring times of the main caregiver of patients undergoing renal transplantation surgery.

**Method:** This randomized clinical trial study was performed on 70 patients undergoing renal transplantation surgery in two groups of 35 intervention and control groups at al-ibn 'Abitaleb hospital in Zahedan, Iran. The data gathering tool was a demographic and care information questionnaire (ZARIT). After selecting the participants, the patients were randomly divided into intervention and control groups. Subsequently, in the intervention group, training was provided by the Jig-Saw method. Finally, three months after the training, the questionnaire was completed for the main caregiver. Data were analyzed using SPSS software version 22.

**Findings:** The findings showed that the mean score of caring weight in the control group before intervention was not significantly different with the three months after the intervention ( $p < 0.07$ ). But in the intervention group, the mean score of the caring burden before the training decreased significantly with the three months after the training ( $p < 0.001$ ). Also, the comparison of the two groups before intervention was not significant ( $p = 0.052$ ), but after the intervention, there was a significant difference ( $p < 0.001$ ).

**Conclusion:** The present study showed that jig-learning education in patients undergoing renal transplantation surgery has a significant effect on the care burden of their main caregivers. Therefore, it is recommended that systematic training programs be developed for these patients and their main caregivers as well as for other chronic diseases and integrated into the health system.

**Keywords—** Training, jig-saw, care load, the main caregiver, kidney transplant.

## I. INTRODUCTION

One of the biggest challenges facing health systems in the 21st century worldwide is the increasing incidence of chronic diseases and increased burden of these diseases (1). Chronic renal failure is a chronic and common illness that causes a person to continuously play the role of a patient in his life due to his health status, illness and treatment (2). The annual growth rate of this disease in Iran, according to the Center for Transplantation Management and The specific diseases of the Ministry of Health are about 11%. The annual incidence of this disease in Iran is 53 per 1 million people (3). These patients are not able to survive without replacement renal replacement therapy. Alternative treatments include hemodialysis, peritoneal dialysis, and kidney transplantation (4).

Kidney transplantation is considered as a selective therapeutic approach for the treatment of patients with end-stage renal failure, and in many cases is the most effective therapeutic strategy, which causes kidney transplantation to increase the survival of patients in the final stage of renal failure (5). The best benefit of kidney transplantation is the patient's free rein to progressive dialysis and the possibility of free life (6). At the end of 2014, the number of transplant patients in the world was around 684,000 (7). Iran has the

highest rate of kidney transplantation in the Middle East. By 2014, more than 32,000 kidney transplants have been done in Iran, and an additional 2,700-2500 cases are added each year (8). In 1988, the first kidney transplantation center in Urmia began with minimal facilities (9).

Kidney transplantation While providing complete physical rehabilitation, patients after kidney transplantation due to various side effects require frequent visits to clinics to monitor their health status. Patients who have kidney transplants may be in need of ongoing medical care due to complications of immunosuppressive drugs, and this affects the psychological, economic, and social status and, consequently, the quality of life of the individual [10]. Quality of life is a strong predictor of death in ESRD patients and is the most important measure for expressing the outcomes and health outcomes of these patients. As in recent years, the main goal of health care has been to increase survival and improve quality of life (11). Because, according to most studies, quality of life in chronic patients is lower in comparison with the general public, especially in terms of physical functioning and feeling good. Therefore, all health care personnel should have sufficient knowledge in the field of disease in order to provide patients with appropriate and standard care (12).

The effects of chronic illness not only disrupt the lives of patients, but also carers. Carers are those who, during a period

of illness and its treatment, are the most involved in caring for the patient and helping them to adapt and manage chronic illness (13). Studies show that quality of life for caregivers of patients with chronic diseases is impaired (14). Family members, spouses, friends and colleagues of a person with chronic illness also affect the condition. Fear of illness, its complications and death, feelings of helplessness, ambiguity about the future, anxiety, sadness, anger, bitch reaction, economic worries and mental stress in interpersonal relationships, including psychosocial stresses in chronic diseases (15).

Informal care, or family care services that has entered health literature since 1980, is a pillar of the long-term care system that is carried out by family members of friends and relatives (16). Family of carers include the first-degree relatives of the patient who play the main role of supporting the patient in the hospital and caring for the home (17). Caregivers during a course of illness and its treatment are the most involved in caring for the patient and helping them to adapt and manage chronic illness (18). The process of transferring care from the hospital to home care carries more care to the family (19). Care burden is a complex and general concept and is defined as a negative reaction that the caregiver experiences in providing care (20) and imbalances between care needs and other supervisory tasks. This imbalance is related to social and personal roles, physical, emotional and financial resources of caregivers (21).

Certain health interventions such as education can have a dramatic effect on reducing the mental burden of home caregivers, thus providing both a way to improve quality of life and can improve the physical and mental health of home caregivers (22). Methods of teaching to patients vary. One of these methods is a participatory teaching model (group counseling, group training, etc.) with an appropriate educational approach to use problem-solving and thinking and research according to the program, goals, and facilities (23). Different methods for collaborative learning have been identified, each of which has its own characteristics and advantages (24). The jig-wave pattern is one of them. This template contains five elements for collaborative learning success. These include face-to-face interaction, positive relationships among members, individual responsibility, participatory social skills, and group outcomes (25). Participatory learning can be understood with its contradictory explanation: passive learning. In passive learning, which often, and not exclusively, manifests itself in the method of lectures, is an accepted fundamental principle that has a brief knowledge and, in order to fill his mind with knowledge, he must sit in front of a wise person and listen to his speech (26). Persian and colleagues (2009), Mahmoudi et al. (2006), Jalilian et al. (2010) have used different education methods, quoting Firooz (2015). The common point of all of these methods has been to raise awareness and knowledge of patients (27). However, less attention has been paid to training such as reducing the care burden of caregivers (28).

Since there has been no research on the application of this method to reduce the care burden of patients under renal transplantation surgery in our country, this study aimed to

investigate the effect of this method of education on the caregiving burden of the main caregiver of patients undergoing transplantation surgery Kidney was done.

## II. METHOD

This study was a clinical trial with control group. 70 recipients of kidney transplantation from patients referring to Ali ibn Abi Taleb Hospital in Zahedan were selected randomly and assigned to two groups of 35 test and control groups. Sample size with confidence of 95%, test power of 80% and based on the results of study, Masoudi et al. (29) were determined. Patient entry criteria include a patient with at least three months of kidney transplantation, ages 18-60, having reading and writing skills, having no mental and psychological disorder leading to treatment, ability to complete a questionnaire, attending educational meetings, and having full satisfaction for attendance. Was in the research. Major caregivers included: at least 18 years of age, having reading and writing skills, lack of psychological and mental illness leading to treatment, ability to complete the questionnaire, having complete satisfaction for participation in the research. Exit criteria of the patients included the reluctance or unwillingness to attend the post-intervention phase, the reluctance to continue the study, the lack of attendance at the training sessions, even the number of sessions and the intention to change lifestyle during the next three months. And the criteria for leaving the study of the main carers included the reluctance or unwillingness to attend the post-intervention phase was to change lifestyle within the next three months.

The instrument of this study was a demographic questionnaire (containing patient's demographic information and patient's main caregiver), ZARIT's Care Burden Questionnaire. The questionnaire has 22 questions on care issues, which, based on the 5-point Likert scale, never exceeds the zero points of 4,3,2,1. The range of grades 0-88 and the increase of points means increased care burden. Caregivers 20-40 indicate a low level of care, a low to moderate 40-60 times care, a moderate to severe midwifery 60-80 times, and a high-maintenance care interval of 80-100 (30). Validity and reliability of this questionnaire have been confirmed in previous studies. The reliability of this questionnaire, quoted by Nawab, in the research by Pahlavan Zadeh et al. (31), which was performed through a re-test, was 94%.

In the next stage, educational intervention was conducted. In the Jig Saw group, the training was carried out with the content of self-care in a Jig-Saw course during three sessions with a one-week interval of 45 to 60 minutes. Participants in six groups of five, each grouping of a jig-group, were divided and a training package was given to each member of the group. Then for each member of the group, one part of the study materials was considered for study. At the next meeting, members of the groups who shared the study materials were grouped into a group called the expert group and shared the material. At the third meeting, expert group members returned to their jig-saw groups and provided what they learned to other members of the group. Finally, three months after the last training session, the ZARIT questionnaire was completed again for the caregiver's main caregiver time. It should be

noted that the control group did not receive any special training. For data analysis, using SPSS-22 software, the data were normalized using a sample of Kolmogorov-Smirnov. To compare the demographic characteristics, Chi-square test, mean of service scores, before and after the intervention in both groups, the paired t-test and the comparison of the mean of the scores of care in both groups at the time before and after the intervention from independent t-test used. The significance level of the tests is less than 0.05.

### III. FINDINGS

The results of demographic information of patients and caregivers are shown in Table I and Table II. Table III shows the comparison of mean changes in care burden before and after intervention in both groups. The findings of Table I show that there is no significant relationship between demographic characteristics of patients in both intervention and control groups, and in this regard, the groups are similar (Table I).

TABLE I. Comparison of frequency distribution of demographic characteristics of patients in two groups of intervention and control.

Variable		Intervention group N= 35	Control group N= 35	P-Value
Age		55/48±8/86	54/20±10/40	0/48
Sexuality	Man	(21/4%)15	(21/4%)15	1/00
	Woman	(28/6%)20	(28/6%)20	
Level of Education	Elementary	(21/4%)15	(11/4%)8	0/34
	intermediate	(10/0%)7	(11/4%)8	
	Diploma	(12/9%)9	(18/6%)13	
Academic		(5/7%)4	(8/6%)6	
Duration of diabetes		11/54±5/4	9/71±6/75	0/19

Findings of Table II also show that there is no significant relationship between the demographic characteristics of the main caretakers in the intervention and control groups, and in this regard, the groups are similar (Table II).

TABLE II. Comparison of frequency distribution of demographic characteristics of the main caretakers participating in the intervention and control groups.

Variable		Intervention group N= 35	Control group N= 35	P-Value
Age		45/37±13/00	47/97±11/07	0/94
Sexuality	Man	(25/7%)18	(22/9%)16	0/63
	Woman	(24/3%)17	(27/1%)19	
Level of Education	Elementary	(7/1%)5	(10/0%)7	0/20
	intermediate	0	(2/9%)2	
	Diploma	(20/0%)14	(24/3%)17	
Academic		(22/9%)16	(12/9%)9	
Relative to the patient	Mother	0	(1/4%)1	0/54
	Spouse	(34/3%)24	(35/7%)25	
	Child	(15/7%)11	11(12/9%)9	

Regarding the care burden, the results of paired t-test showed that the mean score of caring weight in the control group before intervention was not significant after three months after the intervention ( $p = 0.07$ ). On the other hand, in the intervention group, the mean score of caring weight before intervention was significantly decreased by three months after the intervention ( $p < 0.001$ ). The independent t-test for care

load in the two groups before intervention was not significant ( $p = 0.052$ ), but after intervention, there was a significant difference ( $p < 0.001$ ) (Table III).

TABLE III. Comparison of the mean of care load score before and after intervention in the studied groups.

Time Group	Before intervention	After intervention	Paired t test
	M±SD	M±SD	
Control	46/94±8/74	47/28±3/00	0/07
Intervention	42/88±7/16	32/00±3/28	P:0/001
Independent t test	0/052	P<0/001	-

### IV. RESULT AND DISCUSSION

The aim of this study was to determine the effect of education on the protective care burden of patients undergoing renal transplantation surgery. The results of the comparison of the mean score of the main caregiver's caring weight in this study showed that the score of the standard of care in the control group and intervention before intervention was not statistically significant ( $p = 0.052$ ). Also, the score of caring weight in the intervention group after training compared to Before the intervention, there was a significant difference between the two groups ( $p > 0.001$ ). In this regard, Nawab et al. (1394) conducted a research aimed at determining the effect of teaching behavioral-behavioral interventions on family care burden on family caregivers of elderly patients with Alzheimer's disease. Their results showed that the scores of care burden in the control and control groups before the intervention were not statistically significant (20). However, the score of care burden after intervention in the experimental group significantly decreased, which results of this study is consistent with the results of the present study and probably indicates that new educational methods can reduce caregivers.

In this study, Tan (2006) concluded that the participation of a family member with a patient in the classroom would increase the impact of these classes. (29). Therefore, in the classroom, in addition to the presence of the patient, the presence of the main caregiver can also contribute to the effect of training.

In a study by Navidian et al. (2010) with the aim of evaluating the effectiveness of family education on the mental burden of home caregivers, the average score of psychological burden in home caregivers of schizophrenic patients and mental disorders receiving mental health intervention was significantly reduced. The control group was reduced and the results of this study were consistent with the results of the present study and confirmed the effect of education on the reduction of caregivers weight of the main carers (32). Learning to be a patient is key to self-care behaviors in diabetics and plays an important role in managing patient health. On the other hand, in education, caregivers need to use patient-centered communication approaches along with assessment of patient perceptions in their education to improve patient adherence to self-care behaviors (30).

According to the results, the use of this method (jig-saw) in patient education has been considered and its effects have been shown to improve the level of self-care of these patients. The present study showed that education in patients

undergoing renal transplantation surgery affects their caregivers' caring burden. Although simpler educational methods can also be useful in teaching, the present study showed that the Jig-Sao method, which is a cooperative learning method, has a significant impact on the carer's care burden. Therefore, it is recommended that regular education programs be developed for these patients and other patients with chronic diseases and integrated into the health system.

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