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Effect of illness perception promoting interventions on treatment adherence in hemodialysis patients: A randomized controlled trial

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ABSTRACT

Aims: Illness perception plays an important role in self-care behavior and treatment adherence in hemodialysis patients. So interventions that promote illness perception can cause improvement in treatment adherence of Hemodialysis patients. Hence, this study had been conducted with the aim of determining the effect of illness perception promoting interventions on treatment adherence in hemodialysis patients.
Methods: In this randomized clinical trial, 71 patients undergoing hemodialysis were allocated randomly to the intervention (n=38) and control (n=33) groups. For data collection, a two-part questionnaire consists of socio-demographic questionnaire and questionnaire of treatment adherence of hemodialysis patients (ESRD-AQ) were used. After pretest, patients in intervention group received illness perception promoting interventions individually for six sessions and control group just received routine care of the unit. Posttest was done 8 weeks after the end of intervention. The data of the study were analyzed by using SPSS-16 software and independent and paired T test.
Results: Results showed that patients participating in illness perception promoting interventions had significantly higher scores in the areas of adherence to medication (p=0.01), adherence to liquid limitation (p=0.001), adherence to dietary restriction (p=0.001) and shortening durance of the hemodialysis sessions (p= 0.04) than patients in control group.
Conclusions: illness perception promoting interventions causes improvement in some dimensions of treatment adherence in hemodialysis patients. Considering inadequate research literature, there is a need for more research in this area.

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1. Introduction

Chronic renal failure is among chronic diseases that people due to disease and its long-term treatment always play role of a patient in their

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life [1,2,3]. Prevalence of chronic renal failure in the world is 242 cases per one million people that about 8% are added to this number annually [4]. According to the reports of research center for kidney patients and kidney transplant in Iran in 2007, about 29 thousand people suffered from chronic renal failure in the country that among this number 14 thousand were treated by hemodialysis [5].

End Stage Renal Disease (ESRD) patients are treated by dialysis for providing their health. These patients face with many challenges in order to adhere treatment. Health retaining of these patients is dependent on four aspects of treatment that consist; liquid consumption limitation, dietary precautions, consuming recommended drugs and regular participation in dialysis sessions. So all of these things can be recognized as treatment adherence behaviors in Hemodialysis patients [6,7,8]. Nowadays patients' failure in adhering prescribed treatment diets is one of the most important problems of health care [9].

A review on the texts expresses that; between 20% to 80% of the patients fails in adhering treatment and changes in lifestyle [10]. Inadequate adherence of patients has severe complications such as; increase of disease intensity, death and economic burden [11].

Since the amount of adhering treatment in the ESRD patients is directly related with inappropriate clinical outcomes [12, 13, 14, 15, 16], so many researchers try to recognize effective factors on adhering treatment and explanatory models of adhering treatment. [17, 18].

One of the effective models for perceiving the role of cognitive factors in health consistency behaviors and disease outcomes is Self-Regulation Model (SRM) [19]. Self-regulation behavioral model emphasizes on the importance of behaviors related to adhering treatment. According to this model, people play a dynamic and active role in their disease perception and at the time of facing disease threat, they are always looking for returning to their last equilibrium [20]. So a person who has positive perceptions of his/her disease is able to perceive and analyze other signs and dimensions of the disease correctly and realistically that these perceptions can be effective on behaviors related to health [21]. According to this model, five dimensions of disease perception that have role in balancing people's behavior and their treatment adhering include: disease nature, disease time duration, disease outcomes, person's belief about the reasons that cause beginning of the disease and controllability of the disease [22].

Results of some studies show that negative perception related to disease has an important role in treatment adherence of the patients [19, 23, 24]. Petri et.al expressed that patient's perception about duration of the disease and its outcomes predict time of returning to work in the patients suffering from MI [25]. Also in another study, it has been reported that in the adults suffering from Fibrocystic, people's perception about controllability, disease duration time and their perception about the necessity of treatment were predictors of self-reporting of treatment adherence [26].

According to the results of the above studies, it seems that in the case of promotion of patients' perception, we can influence on disease outcomes such as; treatment adherence. On one hand, one of the mentioned limitations in the similar studies has been performance of interventions in common and group form and it was according to SRM, because every patient has unique perception about his/ her disease [18], so performing interventions in individual form in order to achieve the aims seems more appropriate. So this study had been done with the aim of assessing the effect of promoting interventions of disease perception on treatment adherence in hemodialysis patients.

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2. Methods

This clinical trial study has pretest-posttest design that had been done in two intervention and control group. The population of this study includes all the patients suffering from chronic renal failure that refer to hemodialysis unit of treatment-educational center of Ayatollah Taleghani affiliated to Medical Science University of Urmia. 80 eligible patients after preliminary studies had been chosen through sampling method and then they had been divided into two intervention and control group by simple random method and by using table of random numbers. Inclusion criteria to the study were: patients of 18 years old and higher undergoing treatment by hemodialysis at least for 6 months, having at least two sessions hemodialysis a weak. Patients who had the experience of kidney transplantation and patients who did not like to continue the study were excluded. The way of allocating samples and the process of doing work are mentioned in the diagram 1.

For data collection, a questionnaire with two parts that consists social-demographic information and the End Stage Renal Disease-Adherence Questionnaire (ESRD-AQ) of the patients undergoing hemodialysis had been used. These tools had been made by Kim et.al in 2010 (27). This questionnaire consists of 41 items that is divided into 4 areas: regular attendance at hemodialysis sessions (14 items), consuming prescribed drugs (9items), and limitation of liquid consumption (10 items) and limitation of diet consumption (8 items). Most of the questions had been graded in the form of Likret scale. These tools have been used in Iran by Khalili et.al (28) that had appropriate reliability and validity in Iranian population (Cronbach's alpha coefficient=0.75). In order to use this questionnaire in the present study, reverse translation had been used. Regarding this, the questionnaire had been translated to Persian at first, and then this translation had been translated to English again by an English language expert. According to the correspondence of two English texts, the Persian text had been corrected. In this study, after translation, face and content validity of the study had been confirmed by 12 professors of Medical Science University of Tabriz, in order to determine reliability of the tools Cronbach's alpha method had been used and after studying guide, it had been used on 15 patients (Cronbach's alpha=0.79).

In order to do patients' interventions, patients achieved promoting interventions of disease perception individually in the form of weakly face to face education, during 6 sessions of 45 minutes. These interventions had been based on 5 dimensions of disease perception and also the effect that disease perception can have in adherence behaviors of the patients. These dimensions included: nature (label and signs related to disease such as; tiredness and weakness), person's believe or reason about the causes of beginning of the disease, duration time or person's perception about duration of disease, person's expected outcomes or findings of the disease and effectiveness of control and improvement. Patients' follow-up during an eight-week period had been done after intervention and techniques of self-monitoring, verbal encouragement, goal setting (for example for increasing weight between hemodialysis sessions), feedback and evaluation of daily goal behaviors (achieving liquid and etc.), diary, successful experiences of the similar people and adjustment process of the patients about disease and hemodialysis treatment had been used. In fact interventions had been designed in order to change incorrect and negative perception that patients could have towards disease. Because of the environment of hemodialysis units and establishing a close relationship between patients in the unit, there was no possibility for doing study referring neither for the researcher nor for the patients. In order to provide education for the patients, a skilled advisor helped in promoting

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interventions of disease perception at least for two sessions. Principles and application examples that had been used in order to promote disease perception for this study were taken from last studies and it had been done by considering; cultural differences, previous interests and society norms and it had been done after evaluation of the amount of previous preparation, experiences and perceptions. Also, in order to prevent bias in performing interventions, patients of intervention and control group had been chosen from two separated shifts (patients of control group from morning shift and patients of intervention group from evening shift), in order to prevent exchange of information between two groups. Patients of control group only achieved common educations of the unit. Eight weeks after the end of the study, posttest had been done for both groups.

For analyzing data SPSS statistical software (version 16) had been used. For determining frequency, percentage, average and standard deviation of the variables, descriptive statistic had been used. Also for comparing scores of adherence to treatment regimen before and 8 weeks after intervention in every group, paired t-test had been used, and for comparing average difference of adherence to treatment regimen between posttest and pretest in intervention and control groups, independent t-test with had been used. Significant level had been considered $p<0.05$.

Table 1: Socio-demographic features of hemodialysis patients of intervention and control groups

Variables		Intervention group	control group	Statistical indicators		
		Frequency (percentage)	Frequency (percentage)			
gender	male	25(65.8)	20(60.6)	x^2 =5.08	p=0.02	df=1
	female	13(34.2)	13(39.4)			
education	illiterate	1(2.6)	2(6.1)	x^2 =62.46	p=0.02	df=1
	Lower than Diploma	26(68.4)	20(60.6)			
	Diploma	7(18.4)	5(15.2)			
	High education	4(10.5)	6(18.2)			
Marital status	married	25(67.6)	27(82)	x^2=59.5	p=0.001	df=1
	single	1(2.6)	2(6.1)			
	Lost mate	12(33.4)	4(11.9)			
Number of dialysis sessions per week	2 or less	7(18.4)	3(9.1)	t=-1.02	p=0.30	df=69
	3	30(78.9)	29(87.9)			
	4	1(2.6)	1(3)			
Dialysis time (average ± standard deviation in year		2.5±1.03	2.5±1.2	t= -0.27	p=0.78	df=69
Age (average± standard deviation in year)		47.5±12.8	48.1±11.9	t= -0.20	P=0.84	df=69

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Table 2: Comparing scores of posttest and pretest of treatment adherence in the patients of two intervention and control group

	control group (n=33)					Intervention group (n=38)				
area	pretest	posttest	df	p	t	pretest	posttest	t	p	df
Adherence to medication regimen	175.7±39.7	171.2±39.5	32	0.26	1.13	147.3±48.04	186.4±25.4	-2.48	0.01	36
Adherence to liquid limitation	153.03±55.8	151.5±55.1	32	0.74	0.32	125±68.5	153.9±45.5	-4.01	0.001	37
Adherence to diet limitation	148.4±38.4	146.9±41.3	32	0.74	0.32	140.7±47.7	168.4±35.6	-4.11	0.001	37
Shortening time of dialysis sessions	184.8±44.1	178.7±46.8	32	0.10	1.67	192.1±27.3	193.4±20.7	-1	0.32	37
Attendance in dialysis sessions	266.6±77.7	256±93.9	32	0.25	1.15	273.6±68.5	277.6±62	-1	0.32	37
Treatment adherence	928.7±171.8	904.5±183	32	0.35	1.2	913.5±147.9	989.1±108	-5.6	0.001	36

In this study, all the principles of the studies had been observed by human subjects. At first study plan had been confirmed by ethics regional committee and research of Medical Science University of Tabriz. About the way of doing the study and participants' rights, necessary awareness had been given to the patients of both groups and it has been cleared that lack of their participation in the study has no relationship with their achievement of cares and informed consent had been taken from all the participants of the study.

3. Results

Socio-demographic features of 71 hemodialysis patients participating in the study are in table 1. As it is clear in the table, there is no significant difference between patients of two groups from the approach of these features.

Assessing scores of treatment adherence in the groups showed that about patients of control group, before and after intervention, there is no significant difference in none of the dimensions of treatment adherence. On the other hand, about patients of intervention group, in all the dimensions except shortening the duration of hemodialysis session and attendance the sessions, no significant difference between pretest and posttest had been observed (Table 1).

Results showed that after disease perception promoting interventions, difference of scores average of treatment adherence in the dimension of adherence to medication regimen, adherence to liquid limitation, adherence to diet limitation and shortening dialysis sessions, between intervention and control group has been statistically significant, but there was no significant difference in the dimension of attendance in dialysis sessions (Table 2).

4. Discussion

The main aim of this study was to assess the effect of disease perception promoting interventions on treatment adherence in hemodialysis patients. This is the first study that assesses the effect of individual interventions of disease perception in the patients. Regarding this, results of the present study shows that disease perception promoting interventions leads to improvement of treatment adherence of the patients who are treating with hemodialysis. In other words if the patients have better perception of their health condition,

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treatment adherence is going to be increased in them. Broad review of the texts show that, although there are many studies that focus on recognizing factors that influence treatment adherence, there is little attention for designing, performing and testing interventions such as; disease perception promoting interventions for promoting adherence and the conducted studies had reported inconsistent results. Previous studies about this subject also confirm relationship between disease perception and treatment adherence. In a study which had been done by Kim et al (2010) on hemodialysis patients showed relationship between disease perception and treatment adherence in these patients [27].

Also, in another study that had been done by Chilot et.al (2010) disease perception had been introduced as a strong predictor of adherence to liquid limitation in hemodialysis patients. In this study adherence treatment of the patients had been studied by using average weight gain of two sessions' dialysis [29]. In contrary to the results of the study, another study which had been done by Arnold et.al (2008) on hemodialysis patients showed that there was no relationship between disease perception and adherence to liquid limitation in hemodialysis patients [30].

The present study showed that treatment adherence in "adherence to medication regimen" , "adherence to diet regimen", adherence to liquid limitation" and "shortening dialysis sessions" dimensions in intervention group, before and after achieving disease perception interventions has been significant. While in control group, none of the treatment adherence dimensions showed significant difference. Results of this study are comparable with a study which had been done by Christensen et.al (2002). In this study disease perception interventions had been performed on 40 hemodialysis patients. Results showed improvement of adherence to liquid limitation after seven or eight weeks of follow-up. In this study the amount of adherence to liquid limitation had been studied by interdialytic weight gain (IDWG) and the results has indicated decrease of the amount of IDWG, 8 weeks after achieving interventions [31].

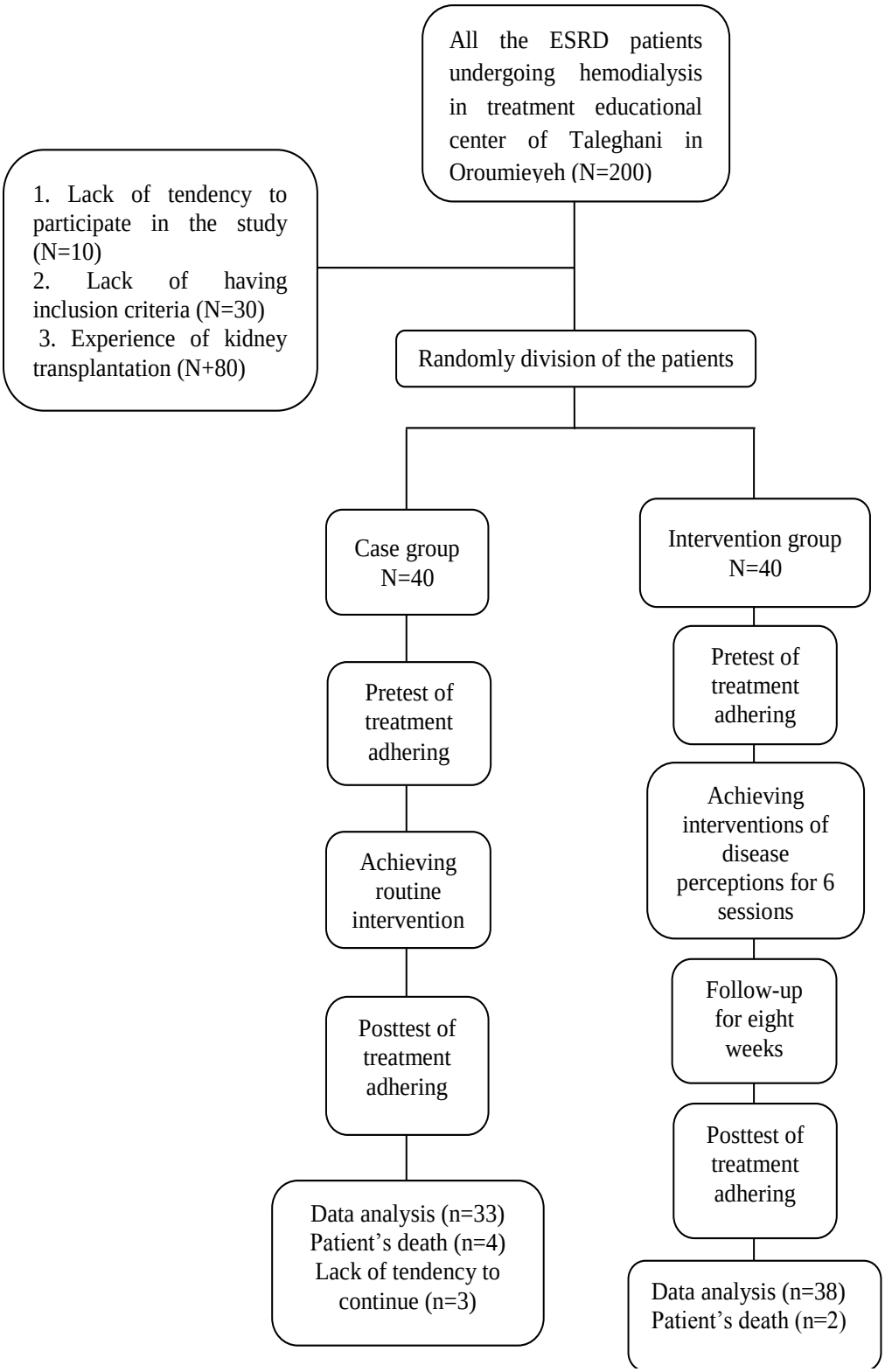
The study which had been done on the patients suffering from Myocardial Infarction, achieved changes of intervention in two time intervals had been assessed, once after the end of interventions and once three months after hospital discharge. results show that change of these patients' perception about disease is effective in improving functional consequences of these patients after Myocardial Infarction such as; (better preparation for hospital discharging , faster return to work and less experience of Angina pain) [32].

Table 3: Comparing the difference of posttest and pretest scores average of treatment adherence in the patients of two intervention and control group

Study items	Control group (n=33)	Intervention group (n=38)	Statistical indicators		
	Difference of the averages	Difference of the averages	df	t	p
Adherence to medication regimen	-4.5±22.9	12.1±29.8	68	2.6	0.01
Adherence to liquid limitation	-1.5±26.4	28.9±44.4	69	3.4	0.001
Adherence to diet limitation	-1.5±20.4	27.6±41.4	69	3.4	0.001
Shortening time of dialysis sessions	6±20.7	1.3±8.1	69	2.02	0.04
attendance in dialysis sessions	-10.6±52.6	3.9±24.3	69	1.5	0.13

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Diagram 1: Clinical trial study in the patients suffering from chronic renal failure that are treating by hemodialysis.



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As it has been expressed in SRM, disease perception can be effective in people's coping with disease and adherence or lack of adherence to treatment and prescribed recommendations. When people have adequate knowledge about different aspects of their disease and are able to manage different aspects of their disease, then they are able to have better coping with disease and treatment and in this way, they have better adherence to treatments and recommendations of treatment staff. Findings of this study confirm this point too.

5. Conclusions

In general, it can be said that hemodialysis patients due to disease nature need to have correct perception of disease and nurses can be effective in the patients' treatment adherence through interventions based on disease perception. Better treatment adherence of the patients leads to ideal management of disease and also it leads to decrease of the amount of morbidity and death in this group of patients.

This study has some limitations. The study population had been chosen from a hemodialysis center in a cold region that weather and cultural matters of the area can influence on the amount of the patients' adherence especially in liquid limitation dimension. So it is recommended that, future studies should be done on larger sample of the patients. Considering that in this study, patients after achieving interventions had been measured only one time, so it is recommended that in order to achieve to the aims in the future studies, patients' information measurement should be done in several time intervals of the interventions, in order to assess long-term effects of disease perception interventions on patients' treatment adherence. Also in this study in order to assess treatment adherence, subjective criteria and self-report tools had been used, that it is recommended in the next studies, objective tools such as; clinical or laboratory indicators should also be used for assessing patients' treatment adherence.

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