

## Labor Force Participation in Patients with Hemodialysis and Peritoneal Dialysis Treatment

### Hemodiyaliz ve Periton Diyalizi Tedavisi olan Hastalarda İşgücüne Katılım

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#### ABSTRACT

**Background:** The prevalence of End-Stage Renal Disease (ESRD) has significantly increased in developing countries and similar to the worldwide trend, the number of incident Chronic Kidney Disease (CKD) stage 5 patients is also increasing in the Iran. This study aims to compare the Labor force participation in patients with hemodialysis and Peritoneal Dialysis (PD) treatment.

**Method:** The cross sectional study was conducted on 208 patients referred to dialysis centers of north of Iran and Tehran, between January 2015 and January 2016. A checklist was designed to gather data of labor participation and socio-economic status of patients. In addition Kidney Disease Quality of Life (KDQOL) questionnaire was used to calculate mental and physical health of patients. All statistical analysis were done using STATA SE software version 13.1.

**Results:** The study highlights several findings including the higher mental and physical health quality of life, higher average monthly income in PD employed patients. Also, the type of treatment had significant relationship with labor force participation and it was higher for patients using peritoneal dialysis.

**Conclusion:** It seems the government and especially ministry of health and medical education should give more attention to inform the public about the advantages of PD and especially its positive impact on employment of patients

**Key Words:** Peritoneal dialysis, Hemodialysis, Labor force, Employment

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#### ABSTRACT

**Amaç:** Gelişmekte olan ülkelerde Son Dönem Böbrek Hastalığı (SDBH) prevalansı önemli ölçüde artmıştır. Dünyadaki trendlere benzer şekilde, İran'da meydana gelen Kronik Böbrek Hastalığı (KBH) evre 5 hasta sayısı da artmaktadır. Bu çalışma hemodiyaliz ve Periton Diyaliz (PD) tedavisi olan hastalarda işgücüne katılımını karşılaştırmayı amaçlamaktadır.

**Yöntem:** Kesitsel çalışma Ocak 2015-Ocak 2016 arasında İran'ın eyaletinin diyaliz merkezlerine sevk edilen 208 hasta üzerinde gerçekleştirilmiştir. Hastaların iş gücü katılımı ve sosyo-ekonomik durumu hakkında veri toplamak için bir kontrol listesi tasarlandı. Ayrıca hastaların zihinsel ve fiziksel sağlıklarını hesaplamak için Böbrek Hastalığı Yaşam Kalitesi (KDQOL) anketi kullanıldı. Tüm istatistiksel analizler STATA SE yazılım versiyonu 13.1 kullanılarak yapıldı.

**Bulgular:** Çalışma PD istihdam hastalarda yaşam daha yüksek zihinsel ve fiziksel sağlık kalitesi gibi çeşitli bulgular, yüksek ortalama aylık geliri vurgulamaktadır. Ayrıca, tedavi türünün işgücüne katılımı ile anlamlı bir ilişkisi vardı ve periton diyalizi kullanan hastalarda daha yüksekti.

**Sonuç:** Hükümetin ve özellikle Sağlık ve Tıp Eğitim Bakanlığının kamuoyunun PD'nin avantajları ve özellikle hastaların istihdamı üzerindeki olumlu etkisi hakkında bilgilendirilmesi için daha fazla dikkat göstermesi gerektiği görünüyor.

**Anahtar Sözcükler:** periton diyalizi, hemodiyaliz, işgücü, istihdam

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## INTRODUCTION

End-stage renal disease is a chronic condition with three dominated methods to treat the patients including peritoneal dialysis (PD), hemodialysis (HD) and transplant surgery (1). The latter is most effective and also too expensive. According to studies, total patient survival is similar for PD and HD patients, and often, it seems that patient choice determines the modality (2). This is confirmed by the United States renal data system 2012 Annual Report. However, patients have different problems in the various dimensions of their life (3). An important aspect is the occupational situation. The employment status is an important factor that affects the quality of life in these patients. Loss of employment is not unusual among dialysis patients, and associated with negative outcomes, such as anxiety, depression, isolation, and loss of self-confidence (4). Studies show that patients with successful kidney transplant have the high employment rate, while PD patients have better employment rates than HD patients (5).

As seen worldwide, the prevalence of ESRD has significantly increased in developing countries and similar to the worldwide trend, the number of incident CKD stage 5 patients is also increasing in the Iran (6). The growing rate of ESRD in Iran is 6% annually, and the hemodialysis is the prevalent modality in the country (7). In Iran, the most frequent causes of ESRD are diabetes mellitus, hypertension, cystic and congenital disorders, glomerulonephritis, urinary tract infections, vasculitis, tubule-interstitial nephritis and pregnancy related (6). Alternative renal replacement therapy in Iran is HD 48.5%, PD 3%, and kidney transplantation 48.5% (8). Although, HD is the most used modality in the country, PD has several advantages including the possibility of it being offered in the remotest of locations and being significantly more affordable than HD in most cases and, in result PD patients can have better occupation position because of the low need for going to medical centers (3).

There are limited data about the Labor force participation in patients utilizing HD and PD treatment. We performed a cross-sectional analysis for comparing the occupational status of these two group of patients referred to dialysis centers of Northern provinces of Iran.

## Methods

This cross sectional study was conducted on 208 patients (106 patients utilizing HD treatment and 102 patients utilizing PD treatment) referred to dialysis centers of north of Iran. These patients were referred to provinces of north of Iran, contained Guilan, Mazandaran, Golestan and Tehran between January 2015 and January 2016. Inclusion criteria of study contained: Patients were at working age (18-65 years old). Exclusion criteria contained housewives and those patients were not economically active before suffering with dialysis illness and those patients which had other important chronic diseases like heart disease. Diabetic patients were not excluded from the study because most of patients added in the study suffered with diabetes.

A checklist was designed to gather data of labor participation and socio-economic status of patients. In the checklist, some questions about date of birth, income, suffering with chronic diseases, education status, gender, type of dialysis treatment, etc. were added. In addition KDQOL-SF questionnaire was used to calculate mental and physical health of patients. KQQOL SF questionnaire has two dimension of physical and mental health and its Persian version reliability and validity was confirmed in a cross sectional study in Iran (9). First to calculate sample size, a pilot study was done at 30 patients and the sample size was calculated 198 patients and increased to 208 patients for having more accuracy. In this study participation of labor force contained those population who work more than 8 hours each week (part time or full time) and earn money from their work. The study was confirmed ethically in Guilan University of Medical Sciences. To compare labor force participation of HD and PD treated patients logistic regression models were used. The model is shown below:

$$lfp_i = \beta_0 + \beta_1 trt_i + \beta_2 phy_i + \beta_3 mnt_i + \beta_4 inc_i + \beta_5 edu_i + \beta_6 sex_i + \beta_7 dib_i + \beta_8 age_i + \varepsilon_i$$

Where in the model *lfp* is labor force participation (LFP) of each patient (0= not working more than 8 hours a week, 1= working more than 8 hours), *trt* is treatment method (0= hemodialysis method, 1= peritoneal dialysis method), *phy* is the score of physical health derived from KDQOL questionnaire, *mnt* is mental health score of KDQOLSF questionnaire, *inc* is income of the patient, *Edu* is the level of education contained illiterate, primary education, secondary education, high school education and university degrees, *sex* is gender of the patient contained 0 for males and 1 for females and *age* was the age of patients. *Dib* is suffering with diabetes contained 0= not suffering with diabetes and 1= suffering with diabetes. All statistical analysis were done using STATA SE software version 13.1.

## RESULTS

Table 1 shows descriptive statistics of study. As shown in the table, physical quality of life in patients utilizing HD treatment was 35.574 and for patients of PD was significantly higher (39.127). In addition mental health quality of life for PD patients was significantly higher than HD patients (40.187 vs 37.633). Overall quality of life of PD patients and HD patients were 38.60 and 36.52 respectively which showed higher quality of life of PD patients. In addition average monthly income for employed patients was 343.1 US\$ for HDs and 401.9 US\$ for PDs which showed significantly higher for PD treated patients. Average age of patients received HD treatment was 51.5 years old and those received PD treatment was 47.01 years old. No differences in percentage of diabetes illness were found between two groups (58.8% for HD and 56.6% for PD patients). LFP rate for patients using HD treatment was 49.01% while it was 69.81% for PD treatment and the results showed LFP for patients using PD treatment was statistically higher compare to those using HD treatment.

Table 1: Descriptive statistics

variable	Mean	SE	Mean	SE	P-value	test
	hemodialysis		peritoneal			
physical quality of life	35.574	0.565	39.127	0.694	0.0001	t-test
mental quality of life	37.633	0.867	40.187	0.636	0.0178	t-test
overall quality of life	36.524	0.528	38.605	0.536	0.0062	t-test
average monthly income (US\$)	343.1	145	401.9	213	0.0248	t-test
average age	51.50	1.468	47.018	1.705	0.0480	t-test
percentage of diabetes	%58.8	0.049	%56.6	0.048	0.7460	X <sup>2</sup> -test
Labor force participation	%49.01	0.049	%69.81	0.044	0.0022	X <sup>2</sup> -test

Table 2 shows the results of logistic regression estimations of the labor force participation model of data used in this study. As shown in the table 2, type of treatment had significant relationship with LFP and it was higher for patients utilizing PD (OR=6.81, P-value=0.001). LFP was significantly less in female patients compare to men (OR=0.233, P-value=0.014).

No significant relationships were found for physical health, education level and age. While in patients suffered diabetes the likelihood of going to work was less and it was significant at 90% confidence interval. (OR=0.3124, P-value=0.062).

In addition by increase in income, LFP increased significantly in the patients (OR=1.0211, p-value=0.000) and by increase in mental health LFP increased too (OR=1.0214, P-value=0.022). Pseudo-R<sup>2</sup> test results for testing goodness of fit of the model showed that the model was designed well (statistics=0.5738) and the

results of Variance Inflation Factor test (VIF) showed that the was very low collinearity between explanatory variables of the study (VIF= 1.29)

**Table 2.** The results of logistic regression estimations of the labor force participation model

Lfp	Odds Ratio	SE	P-value	LL	UL
trt (peritoneal)	6.8172**	4.0445	0.001	2.1311	21.8077
phy	0.9713	0.0416	0.497	0.8931	1.0564
mnt	1.0214**	0.0338	0.022	0.8552	0.9880
sex (female)	0.2338**	0.1384	0.014	0.0733	0.7459
Inc	1.0211**	0.0033	0.000	1.0147	1.0276
Age	0.9891	0.0202	0.591	0.9502	1.0295
edu	base-illiterate				
primary	1.0358	0.6460	0.955	0.3050	3.5171
secondary	1.1290	0.7445	0.854	0.3100	4.1117
high school	1.8824	1.6926	0.482	0.3231	10.9672
university degree	6.5607	20.2440	0.542	0.0155	2776.1400
Dib (suffered diabetes)	0.3124*	0.1949	0.062	0.1655	1.4101
constant	0.1577**	0.4253	0.493	0.0008	31.1421

\*\* Significant at 95% confidence interval.

\* Significant at 90% confidence interval.

## DISCUSSION

This study highlights several findings including the higher mental and physical health quality of life, higher average monthly income, and the higher LFP rate in PD employed patients. Similar to our study, the rate of employment for PD patients was higher in China, Finland and Spain (10-13). Some studies showed that lack of understanding about the disease resulting a low rate of occupation in ESKD patients (14). Moreover some studies suggest that a number of factors such as older age, concurrent chronic diseases, female gender, poor health insurance coverage; and low or no erythropoietin usage before ESKD associated with unemployment (15).

Modalities of dialysis utilization is different in other parts of the world. For instance the Mexico has the highest utilization of PD, where it is estimated that 72% of prevalent dialysis patients were on PD in 2005 (16). Studies have showed that PD patients are more likely to be employed than HD patients (5). However, because of the cross-sectional nature of the research, it is difficult to conclude whether dialysis modality influenced employment status, or whether employment status had an influence on the choice of dialysis modality (17, 18). Differently, Lakshimi reported that there is no difference between PD and HD in the loss of employment of patients (19). As our study showed PD is associated with retaining of employment and greater income compared to HD. This shows a positive role for PD in preservation of socioeconomic status and potentially other patient centered outcomes (4). Although most studies show the positive association between PD and high income of patients but the proportion of patients that choose this modality is less than what is expected. For example, in the India awareness of interviewed HD patients about PD was low (19) that we can conclude that the low knowledge of public is a reason low employment of patients. Although it seems that patients with transplanted kidney can have better employment opportunities, surprisingly a study in the USA showed that the chance for preserving the job decreases especially for patient with public insurance, moreover, the chance to find a job for unemployed patients after transplantation is low even in privately insured patients (20).

Given that low level of patients' information and also their perception about the advantages of PD result in choosing HD (21), it is recommended that the advantages of PD be educated to patients. It seems the government and especially ministry of health and medical education should give more attention to inform the public about the advantages of PD and especially its positive impact on employment of patients.

The study has limitations. First, we have not asked about the attitudes of patients about the type of work that they like to do. So, it is recommended that future studies explore the patients' desired jobs. The findings of this option can help policy makers to develop appropriate job opportunities for patients. Second, we have not asked the patients about the loss of work related to the modality of dialysis. So getting the information about this option can help policy makers to emphasize on the better kind of dialysis for patients to have less loss of work. Third the selection of dialysis treatment method was not voluntary and in some cases the physicians prescribed to select the method due to the patient clinical features.

### Conflict of interest

No conflict of interest was declared by the authors.

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