

Prediction of Depressiveness by Locus of Control, Learned Resourcefulness and Sociotropy-Autonomy in Hemodialysis Patients

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Abstract

Objective: The aims of the present study were to investigate the effects of various personality variables, namely, the locus of control beliefs, learned resourcefulness and sociotropy-autonomy in the prediction of the level of depressiveness in hemodialysis patients. The dependent variable of the study was not the depression but the level of depressiveness measured by the Beck Depression Inventory.

Method: Seventy one permanent hemodialysis outpatients in a treatment center in Ankara participated in the study [43 females and 28 males with mean ($\pm$ SD) ages of 44 ($\pm$ 9.68) and 52.6 ($\pm$ 7.8), respectively]. Beck Depression Inventory, Rotter's Internal External Locus of Control Scale, Rosenbaum's Learned Resourcefulness Scale, Sociotropy-Autonomy Scale and Demographic Information Form were given to the patients. F test and one way ANOVA were conducted to examine the effects of sex and age groups, respectively, and then Stepwise Multiple Regression Analysis was conducted for prediction of depressiveness levels.

Results: The oldest age group (defined as between 56-70 ages) and females had higher depressiveness scores. External locus of control and low level of learned resourcefulness, an indicator of ineffective coping skills were the predictive variables of depressiveness in hemodialysis patients when age, sex, and total length of time on dialysis were controlled. On the other hand, other personality variables, sociotropy and autonomy were not significant predictors.

Conclusion: Female patients and patients in the older age group were significantly more depressive, consistent with the literature, and the results were discussed in the light of the related literature.

Key Words: Hemodialysis, sex, depressiveness, locus of control, learned resourcefulness, sociotropy-autonomy

INTRODUCTION

End stage renal disease is a chronic disease with treatment options of either life-long hemodialysis or renal transplant (Tsay and Healstead 2002). During the dialysis treatment, patients face with multiple stresses. In addition to a total dependence to a machine and care takers, patients have to cope with a disease that restricts and renders himself/herself unfit. They usually have many losses, with all their activities being hindered (Ozatalay 1990), and the quality of their lives is poor (Mollaoglu and Arslan 2003). It is plausible that poor quality of life is, in part, due to concomitant depression (Vazquez et al 2005). Özgür et al (2003) found that physical wear secondary to hemodialysis caused deteriorations in psychological and social parameters and the level of depression

in the patient group was higher than the cut-off point determined for the population. According to Kimmel (2002), the stress factors in dialysis patients include dietary restrictions, long duration of each dialysis session, functional restrictions, loss of job, loss of role, alterations in sexual functions, effects of the disease, effects of the treatment and fear of death. Whether or not all these stress factors cause a depressive mood in dialysis patients with or without other variables awaits further investigation since dialysis per se is not sufficient for a long life.

Many authors believe that having a chronic disease coupled with numerous restrictions patients face with during the course of the disease can cause physical wear as well as psychological problems. Depression standing at the forefront, mental disorders (Sagduyu and Erten

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1998) and depressive mood are frequently observed (Elal and Krespi 1999; Kimmel and Peterson 2005). Frequency of major depression among hemodialysis varies between 5-8.1% (Craven et al 1987; Hinrichsen et al. 1989; Smith et al. 1985), whereas minor depression is observed in 17.7% of the cases (Hinrichsen et al. 1989).

Locus of control is one of the personality dimensions which refers to the beliefs that people's experiences or what happens to them is either a consequence of their behaviors (internal reinforcement) or controlled by external forces (external reinforcement) and there is a debate as to whether they have a significant effect on the occurrence of depression in dialysis patients (Rotter 1966). While people with internal locus of control believe that their behaviors cause the events, those with external locus of control believe that external factors such luck or fate determine the events (Dag 2002). External locus of control is generally related to psychopathology (Dag 1992). Having internal locus of control may manifest itself with the belief that the disease can be kept under control. Locus of control has been reported to be a predictor of depression in these patients (Meijer et al. 2002).

In the present study on dialysis patients, in addition to the locus of control, other personality variables such as learned resourcefulness (coping) and sociotropy-autonomy were also included in the research. Some studies carried out in the Western countries reported findings about the roles of "coping strategies" personality variable in hemodialysis patients (Mok and Tam 2001). To the best of our knowledge, there are no studies that addressed the sociotropy-autonomy variable in such a sample of patients nor are there any studies in Turkey addressing these two factors. However, based on personal observations and experts' opinions, we believed that compliance variable might also be related to these personality factors. Learned resourcefulness is a concept that refers to how effectively an individual uses cognitive coping strategies and the capacity of self-control when confronted with a stressful situation (Rosenbaum 1980; Dag 1991b). This term, in a broader sense, is known as a coping strategy (Folkman and Moskowitz 2004). Sociotropy and autonomy, on the other hand, signifies whether a person is autonomous or dependent to other people (Beck et al. 1983). Similarly, besides being dependent to dialysis machines, the belief that they need the care of other people during their treatment process might also affect the depressive mood in dialysis patients. A moderate relation between sociotropy and depression has been re-

ported (Alford and Gerrity 2003). Prompted by the fact that studies carried out in Turkey did not focus on these personality variables, the present study was designed to determine the effects of locus of control, learned resourcefulness and sociotropy-autonomy personality variables on the level of depressiveness when the effects of age, sex and the length of time on dialysis was controlled for. The level of depressiveness score calculated by the Beck Depression Inventory was the dependent measurement of the study. If we accept the argument that an increase in depressive affect and consequent depression can influence the progress of hemodialysis treatment and patient's compliance to the treatment, and observe that certain personality traits increase level of depressiveness in hemodialysis patients, then this would contribute to developing more effective treatments and increasing quality of life.

METHOD

Sample

Seventy one hemodialysis patients who regularly had dialysis in a private dialysis center in Ankara participated in the study. Subjects included patients with end-stage renal disease who regularly had dialysis 3 times a week, were alert to give verbal or written answers to the scales, and had no other physical illness besides renal disease. Among 97 patients who attended the dialysis center, 26 were excluded from the study due to certain variables that could confound the analysis such as age (being a child or aged 70 years and over), physical disability (absence of a leg), hearing disability, and absence of a literate relative at home who could help the patient who was unable to complete the scales in the dialysis center due fatigue.

There were 43 (60.6%) females and 28 (39.4%) males, with mean ($\pm$ SD) ages of 44 ($\pm$ 9.68) and 52.6 ($\pm$ 7.8) years, respectively. Sex ($n_{\text{female}} > n_{\text{male}}$) and age ($X_{\text{female}} < X_{\text{male}}$) differences in the sample can be attributed to small sample size, which was a consequence of short duration of the study, and natural demographical characteristics of the patients. Sixty subjects of sample (83%) were married, 12 (17%) were single. The level of education was elementary school in 39 (53.5%), secondary school in 17 (24.3%), high school in 10 (14.2%) and university/college in 6 (8%) subjects. Mean length of time on dialysis among female subjects was 4.5 ($\pm$ 2.1) years while that among male subjects was 7.3 ($\pm$ 3.4) years. Other physical disease and medications they used were not controlled.

Data gathering tools

Beck Depression Inventory (BDI). Beck Depression Inventory measures somatic, emotional, cognitive and motivational signs in depression. The aim of this Inventory is not to diagnose depression but to measure the degree of depressive symptoms objectively. The Inventory comprises 21 items with four choices. Maximum score for each item is 3 and, therefore, the highest score can be 63. Higher total scores indicate an increase in the level of depressiveness. Studies carried out in Western countries reported reliability coefficients ranging between .60 and .87. Adaptation studies to Turkish by Hisli (1988; 1989) found the split-half reliability coefficient of the Inventory as .74 while the validity study calculated the correlation coefficient between MMPI-D Scale as .63 (Savasir and Sahin 1997).

Rotter's Internal/External Locus of Control Scale (RIELCS). It is a scale that measures internal-external dimension of generalized control expectancies of individuals; the general expectations or beliefs with regard to the extent to which reinforcements are under self-control or under the influence of external forces (luck or fate) (Rotter 1966). The scale comprises 29 items with two choices, 23 of which are scored to generate a score between 0 and 23. Higher scores denote external locus of control. Studies to adapt the scale to Turkish showed that Cronbach Alfa internal consistency coefficient was .71 and test-retest reliability was .83. In the same study, criterion-related validity of the scale was found to be $r=.69$ ($p<.001$) (Dag 1991a).

Sociotropy-Autonomy Scale (SOCAUTS). The scale assesses two personality traits, namely sociotropy that refers to being dependent to other people and autonomy, which refers to independence from others (Beck et al. 1983). The 60-item scale uses a 5-point Likert scale. Sociotropy and autonomy dimensions are assessed by 30 items each. A score between 0–150 can be obtained for each dimension; a higher point showing stronger dimension. Studies carried out in Turkey reported .70 - .83 internal consistency for sociotropy and .81 for autonomy. Studies addressing the validity of the scale found that sociotropy subscale could differentiate patients from normal groups and that it was closely related to depression. Autonomy subscale, on the other hand, did not differentiate patients from normals. It has been argued that further studies are required to increase the sensitivity of autonomy sub scale with regard to susceptibility to depression (Sahin et al. 1993; Savasir and Sahin 1997).

Rosenbaum's Learned Resourcefulness Scale (RLRS).

This scale assesses how effectively a person uses cognitive coping skills to manage stress and self-control abilities (Rosenbaum 1980; Dag 1991b). Composed of 36 items, the scale is scored using a 5-point Likert scale to generate a score between 0 and 180. Higher the scores, stronger the learned resourcefulness. Studies conducted in Turkey revealed that Cronbach Alfa internal consistency coefficient of the scale was .78. Correlations between items were in the range of .11 and .51 and all correlations were significant. Furthermore, the study on the criterion-related validity of the scale found a significant relation ($-.29$) between the scale and Totter's Internal/External Locus of Control Scale (Dag 1991b).

Data gathering form. Name, sex, date of birth, age at first dialysis, occupation and level of education of patients participated in the study was filled in by the researcher.

METHOD

Each subject had dialysis for four hours, three times a week. First author of the present study, who was working in the private hemodialysis center, interviewed all patients eligible to participate in the study, explained the objectives of the study, got their consents and asked whether they felt all right to fill in all questionnaires without leaving any items unanswered. Majority of the subjects filled in the questionnaires during the dialysis session. As a result of low blood pressure, five patients took the questionnaires home, filled them in at home and returned them later. None of the patients denied participation in the study.

Statistics

F test and one-way ANOVA were carried out to investigate the effects of sex and age groups on depression score and post hoc Tukey test to identify the source of difference between age groups. Age groups were constructed by dividing the age range into 3 equal parts of 15 years. Therefore, subjects were allocated into one of three groups: 24-39 ($n=31$); 40-55 ($n=16$); 56-70 ($n=24$). Stepwise Multiple Regression Analysis was used to predict the level of depressiveness. Pearson's correlation coefficients were calculated to demonstrate the correlations between variables not entered in the equation.

FINDINGS

Scores that subjects got in each scale, sex, age, total length of time on dialysis were entered into statistical analyses. Mean ($\pm$ SD) of all continuous variables are presented in Table I.

Table I. Means and Standard Deviations of continuous variables with regard to sex.

Variables	Female		Male	
	X	SD	X	SD
Length of time on dialysis (years)	4.5	2.1	7.3	3.4
Age	44	9.68	52.6	7.8
Beck Depression Inventory score	22.18	13.82	15.39	4.81
Locus of control scale score	10.91	2.49	7.71	2.48
Learned resourcefulness	125	17.22	123.43	13.18
Sociotropy scale score	83.27	15.90	68.57	18.16
Autonomy scale score	77.82	17.19	71.93	8.9

Age variable was divided into three groups (Group 1: 24-39 years; Group 2: 40-55 years; Group 3: 56-70 years). One-way ANOVA performed to look at the effects of age on the level of depressiveness revealed significant differences between means ($F_{(2,68)} = 12.426$, $p < .01$, $\zeta^2 = .29$). The relation between independent and dependent measurements was strong and age explained 29% of the increase in the level of depressiveness. Post hoc Tukey test was performed to determine the source of this difference between age groups. Results of this analysis and descriptive statistics are presented in Table II.

As shown in Table II, mean score of the subjects in the 56-70 age group was significantly higher than the 24-39 and 40-55 age groups, i.e. subjects in the 56-70 age group were more depressed.

F test was used to examine the effects of sex on the level of depressiveness and a significant difference between two groups was found [$X_{\text{female}} = 18.14$ ($S = 12.06$) > $X_{\text{male}} = 11.14$ ($S = 3.19$)] ($F_{(1,69)} = 8.969$, $p < .01$, $\zeta^2 = .115$), indicating that females were more depressed than males.

In line with the principal aim of the study, Stepwise Multiple Regression Analysis was carried out, taking the level of depressiveness in dialysis patients as predicted variable while age, sex, total length of time on dialysis were taken as control variables and personality variables (locus of control, learned resourcefulness, sociotropy and autonomy) as predictor variables in the first block. Findings of this analysis are summarized in Table III.

In predicting depressiveness scores, age, sex and total length of time on dialysis were entered into the first block as control variables and, as seen in Table III, length of time on dialysis and age explained 8.8% and 7.2% of

the variance in depressiveness scores, respectively. Though there was a significant difference in the F test, sex could not enter the equation. In the second block, two of the four different personality variables were entered the equation as predictors. Learned resourcefulness and locus of control explained 11.1% and 5.5% of the variance in depression scores, respectively. By this way, 32.7% of the variance in depression scores was accounted for. When the control variables were removed, learned resourcefulness and locus of control explained 16.6% of the variance. Increases in the proportion variance by the variables that entered the equation were also significant.

Pearson's correlation coefficients for all variables were calculated to reveal the correlations between variables that were not introduced into the equation and presented in Table IV. Significant correlations between variables varied between .25 and .66.

DISCUSSION

When we look at the etiology of depression in dialysis patients, we find a complex situation. Numerous losses are involved, including loss of function of a vital organ such as the kidneys, loss of physical abilities, cognitive skills, certain roles in the family and work and sexual functions. It has been postulated that all these losses and certain medications used for dialysis can cause depression. Further, depression can affect the patient's benefit from the treatment, compliance to the treatment, nutrition and alter the immune system (Kimmel 2002). It has also been reported that depression in these patients is a predictor of death (Lopes et al. 2002). Moreover, signs of depression overlap with certain signs of chronic renal disease and this complicates studying depression in di-

Table II. Mean depressiveness scores and standard deviations of age groups and the results of Tukey test.

Age group	X	SD	24-39	40-55	56-70
24-39	14,00	8,76		NS	
40-55	9,00	1,95			NS
56-70	22,61	11,68			*

NS= Not significant

(*) $p < .05$

alysis patients (Kimmel 2001; Kimmel et al. 1993). The findings on the level of depressiveness among hemodialysis patients of the present study should be interpreted by keeping in mind this obstacle.

We found that depressiveness scores of female dialysis patients were significantly higher than males. There are discrepancies in the results of studies that investigated depression in dialysis patients. Despite some studies reporting that males suffered from depression significantly more than females, there are also studies reporting no significant difference in the level of depression between males and females (Astan 2001; Akman et al. 2004).

When we examined whether or not there was a significant change in the level of depressiveness with age, we found that patients between the ages of 56 to 70 years were more depressed than younger patients. It has been argued that elderly dialysis patients demonstrated more depressiveness than their healthy peers (Kimmel 2002). In the present study, functional deteriorations and weaknesses and having a chronic health problem were observed with depression. Similar to the signs of aging, signs of chronic medical conditions overlap with the signs of depression, rendering the research difficult (Kimmel 2002; Kutner et al. 2000). However, one can argue that, as people get older, signs of depression increase the risk of physical problems. Studies which showed an increase in the frequency of dialysis sessions with age also argued that certain functional losses observed in elderly patients were also observed among people who were in the same age group but not dialysis patients, suggesting that these deteriorations could be expected (Kutner et al. 2000). A comparative study by Kutner and colleagues (2000) showed that dialysis patients aged 60 years and over were more depressed than their peers who were not dialysis patients. During the follow-up studies, authors concluded that patient group was less likely to benefit from the depression treatment.

In another study from Holland that focused on de-

pression in elderly subjects who were not dialysis patients found that elderly males with low level of education, functional losses, cognitive impairment and other chronic diseases had higher level of depression (Beekman et al. 2000). Reviewing related publications identified two variables with the power of independently predicting the onset of depression, namely chronic medical condition and having an external locus of control to be common in many studies (Beekman et al. 2000). Of note here, is the detection of the onset of depression. If a chronic disease that started earlier in life and certain personality traits such as having an external locus of control facilitate development of depression later, then the importance of the total length of time on dialysis also becomes evident. We found in the present study that total length of time on dialysis had a positive relation with the level of depressiveness. In the multiple regression analysis which sex, age and total length of time on dialysis were entered as control variables, total length of time on dialysis was the first predictor and explained 8.8% of the variance in depressiveness scores. In agreement with previous studies, age was the second predictor and explained 7.2% of the variance in depression scores. A negative relation between the total length of time on dialysis and age ($r = -.32$) was observed, indicating that younger patients in this sample had dialysis for longer times. Though sex significantly correlated with depression score ($r = .29$), it did not enter the equation as a predictor.

The roles of certain personality traits in predicting the level of depressiveness in dialysis patients were explored. Since the effects of age, sex and the total length of time on dialysis on depression scores are well documented in the literature, these variables were entered into the first block of the analysis as control variables to observe the effects of personality traits. In the second block, four different personality variables were entered into the analysis. Learned resourcefulness, locus of control, sociotropy and autonomy were entered into the analysis successively and learned resourcefulness and locus of control were includ-

Table III. The results of Stepwise Multiple Regression Analysis to identify the roles of age, sex, total length of time on dialysis and personality variables in predicting the depressiveness scores.

Variables	R	R ²	R ² (corrected)	Beta	R ² change	F change	F change significance
FIRST BLOCK							
1. Total length of time on dialysis	.297	.088	.075	.297	.088	6,793	.011
2. (+) Age	.400	.160	.136	.283	.072	5,909	.018
SECOND BLOCK							
3. (+) Learned resourcefulness	.521	.272	.240	-.426	.111	10,395	.002
4. (+) Locus of control	.572	.327	.287	.246	.055	5,507	.022

Excluded variables at the end of the analysis: Sex, in the first block; sociotropy and autonomy in the second block.

ed in the equation as predictors. Learned resourcefulness and locus of control explained 11.1% and 5.5% of the variance in depressiveness scores, respectively. These two personality variables together explained 16.6% of the variance. This percentage is the remaining ratio when age, sex and total length of time on dialysis was controlled for. In a study, coping and locus of control have been reported as predictors of depression in these patients (Meijer et al. 2002).

Some studies carried out in the West reported findings related to the roles of coping strategies in hemodialysis patients demonstrating depressive reactions (Mok and Tam 2001). Parallel to low learned resourcefulness, avoidance coping is associated with depressive reactions (Welch and Austin 2001). Hemodialysis patients have been reported to use emotion-oriented coping strategies more than ??? (Ersoy-Kart and Güldü 2005). Takaki and colleagues argued that any interference to alter the coping strategies in these patients could result in changes the level of depressive signs (Takaki et al 2004). If the results of research in the literature are analyzed, one would expect to find a negative relation between coping skills and the level of depression in dialysis patients with high level of learned resourcefulness. Our findings are in support of these findings. Herken and coworkers reported a heavy use of coping strategies in dialysis patients (Herken et al. 2000).

Evans and colleagues (2000) argued that external locus of control could influence depressive signs during chronic diseases, causing a sense of despair and stress. Studies that addressed locus of control in dialysis patients reported an association between internal, rather than external, locus of control and better compliance to treatment while belief that health is controlled by “powerful others”, i.e. external locus of control showed a positive

association with low level depression (Strickland 1978). Strickland’s review article (1978) reported that dialysis patients with internal locus of control demonstrated a more compliant function, took the responsibilities of their behaviors, had more information on their illnesses and put more efforts to improve their health habits.

Despite a significant relation of .29 between autonomy variable and depression score, autonomy did not enter the equation as a predictor. Sociotropy variable, on the other hand, showed a non-significant relation of .11 with depression scores. We did not find any study on hemodialysis patients in the literature to compare this result to but in normal samples, a moderate relation has been found between the level of depressiveness as demonstrated by BDI scores and sociotropy but not with autonomy (Alford and Gerrity 2003).

When personality variables (“permanent, consistent behavioral patterns”) are mentioned, they are, by definition, referred to features that are relatively stable, set in early ages and not easily changed by oneself or other interferences. When the literature was reviewed, locus of control, learned resourcefulness and sociotropy-autonomy variables fit into this description. In thousands of research, they were always taken as independent variables (For a review, see Dag 1992). In the present study, the level of depressiveness was the dependent variable. Since the variability of it is well known, the analysis focused on to what extent it can be predicted by permanent personality variables. In other words, the possibility that learned resourcefulness can change according to the level of depressiveness is out of the question within this definitional framework.

The negative association between age and the total length of time on dialysis makes why learned resourcefulness decreased with the length of time on dialysis

Table IV. Pearson's correlation coefficients between the variables.

(1) Depressiveness	-						
(2) Locus of control	.25*	-					
(3) Learned resourcefulness	-.41***	.15	-				
(4) Sociotropy	.11	.10	-.02	-			
(5) Autonomy	.25*	-.03	.01	.66***	-		
(6) Total length of time on dialysis	.30*	.24*	-.61***	-.50***	-.28*	-	
(7) Age	.16	-.23	.31**	.39***	.63***	-.32**	-
(8) Sex	.29*	-.54***	-.05	-.40***	-.20	-.13	-.18
	(1)	(2)	(3)	(4)	(5)	(6)	(7)

(*) $p < .05$; (**) $p < .01$; (***) $p < .001$

understandable. Coping strategies representing learned resourcefulness are less developed in patients who had chronic renal failure in younger ages than those who had the disease later and this can be attributed to having enough time to develop such strategies before the illness occurs. It is known that in normal samples, there is a negative association between learned resourcefulness and psychopathologies, including depression (Dag 1992). Finding that the external locus of control was a predictor when predicting the level of depressiveness in dialysis patients lends support to the findings of Cauce (1992) cited in Astan (2001). A positive association between external locus of control and the level of psychological signs, including the level of depressiveness, in normal samples is also known (Dag 1992). Moreover, as the proportion of patients who believe in external locus of control increases with the total length of time on dialysis (.24; $p < .05$), it is possible that these patients start to believe that the progress of their diseases is determined not by them but by external factors.

Beck and colleagues (1983) argued that sociotropy-autonomy dimension of personality may be a predisposing factor at the beginning of depressive periods. However, even though it did not turn out to be a predictor, a significant positive relation between depression and autonomy was a noteworthy finding of the present study. Studies in the normal population found female gender and sociotropy predispose for depression. Savasir and Sahin (1997), reviewing validity-reliability studies of Turkish versions of commonly-used scales, concluded that further studies were required for autonomy dimen-

sion. They also found in construct validity study that a close association existed between sociotropy and depression and argued that further studies were necessary to enhance the sensitivity of autonomy subscale to detect vulnerability to depression (Savasir and Sahin 1997). Despite the fact that autonomy and sociotropy are two opposite personality dimensions, we found that they were positively associated with each other (.66) and this raises doubts on the differentiation power of the scale. However, this can be due to small sample size of the present study.

Small sample size and possibility of some biases in the patient population should be taken into consideration when interpreting the results of the present study. It is obvious that results of a study would be generalizable if gender factor and other demographic factors are balanced. We were unable to recruit enough patients due to time constraints and business practices of dialysis centers. We suggest future studies be carried out using a bigger sample size and quality and quantity of the relations between patients and their relatives (caregivers) be addressed. It would also be useful to include a comparison group comprising subjects with other chronic diseases such as diabetes and hypertension. Diagnosing depression clinically rather than using scale-based level of depressiveness, would improve the external validity of findings in future studies. By implementing these suggestions, it would be possible, in a single design, to examine how specific the level of depression observed in dialysis patients is to this problem. Moreover, psychological disorders other than depression observed in dialysis patients

can be studied as a separate research. Finally, examining depression-related factors in a population comprised of child, adolescent and young dialysis patients would be beneficial due to inherent features of these periods.

Based on the results of this study, if we accept the idea that increase in depressive signs and consequent depression can alter the progress of hemodialysis treatment and patient's compliance to the treatment, and observe that certain personality traits increase level of depressiveness in hemodialysis patients, then this would contribute to developing more effective treatments and increasing quality of life. Hemodialysis is a procedure that restricts the daily lives of patients and depression occurs or the level of depressiveness increases in patients dependent on this procedure, as demonstrated by empirical studies. More severe depression has been found in females and elderly dialysis patients. How long patients are undergoing dialysis is a determinant in this relation. Though depression was not diagnosed clinically, these findings were supported. With regard to the possible effects of

certain personality variables on the level of depressiveness in dialysis patients, we established that low learned resourcefulness, which reflects coping skills, and external locus of control belief were predictors of the level of depressiveness while sociotropy-autonomy were not. Though correlations were observed with regard to these variables, there was no conclusive finding. We recommend resolving the problems related to the measurement of these dimensions be prioritized.

The objectives of psycho-social programs to be administered to patients and caregivers in hemodialysis centers should be to lower the level of depression, increase compliance to treatment and quality of life. To achieve this goal, interventions to increase coping skills and enrich self-control experience with inclusion of daily life arrangements can be recommended. Depression is known to persist during follow-ups if additional treatment for depression is not given to these patients (Soykan et al. 2004). Therefore psychiatric interventions are required in these patients.

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