Psychosocial characteristics and self-reported functional status in patients on maintenance dialysis in Hungary

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Abstract. Aims: This survey was conducted to assess psychosocial problems and functional status among patients on maintenance dialysis in Hungary. Methods: All adult patients (n = 4,321) receiving maintenance dialysis in the 56 dialysis centers in Hungary in 2006 were approached to participate in a national, cross-sectional survey. Patients completed a brief self-reported questionnaire. Socio-demographic parameters, disease-related information and data about functional status were collected. Self-rated health and depressive symptoms were also assessed. Results: Mean age was 62 ± 14 y; 52% were males. The prevalence of diabetes was 30%. 46% of participants reported having depressive symptoms. Significant functional limitation was frequent. In multivariable regression models, female gender, poor self-reported finances, less education, history of acute myocardial infarction (AMI) or cerebrovascular disease, the presence of visual or hearing impairment and difficulties with basic activities of daily living were independently associated with the presence of depressive symptoms. In a separate model, age, dialysis vintage, history of AMI or cerebrovascular disease, the presence of visual or hearing impairments, difficulties with basic activities of daily living and also having depressive symptoms were independently associated with self-rated health score. Conclusions: Chronic dialysis patients in Hungary have disadvantaged socioeconomic status, frequent depressive symptoms and many functional limitations. Professional psychosocial help would be particularly important for this underprivileged patient population in addition to high quality dialysis to optimize outcomes.

Introduction

Chronic kidney disease (CKD), and end-stage renal disease (ESRD) in particular is associated with substantially impaired Health Related Quality of Life (HRQoL) [1, 2]. HRQoL of patients with CKD is determined by the complex interplay of psychosocial factors in addition to disease severity and treatment-related factors [2, 3, 4, 5].

Demographic characteristics and comorbidity of the ESRD population have changed dramatically over the last 2 decades. Physical inactivity and decline in physical and cognitive functioning [5, 6] are all very frequent in patients with advanced CKD. The combination of these clinical manifestations has been identified as the "frailty phenotype" [7]. Frail patients are frequently unable to independently perform basic daily activities and functions

such as walking, bathing, and getting dressed. Functional impairment and frailty are recognized markers of disability, indicators of rehabilitation and determinants of caregiving needs and health care costs. They are also important predictors of HRQoL and clinical outcomes of patients with CKD [8, 9, 10, 11].

In addition to disease severity and comorbidity, psychosocial variables are important predictors of HRQoL [2, 8]. Socioeconomic status (SES), best assessed by the level of education or financial status, and also perceived social support determine the resources the patient is able to mobilize to cope with chronic disease [12]. Depression is one of the most common psychological problems among ESRD patients treated with dialysis and is also an important determinant of quality of life [2] and mortality [1, 4].

Lack of social support is particularly prevalent among patients with ESRD. Greater levels of perceived social support are associated with reduced levels of depressive effect, a lower perceived burden of illness, and a higher satisfaction with life [13]. In previous studies, inconsistencies in the relationship between social support and well-being have been observed among patients with kidney disease [14]. Seeman concluded that social relationships have the potential for both health-promoting and health-damaging effects [15]. While it is generally assumed that interventions aimed at increasing social support are beneficial [16], findings of Hoth et al. suggest that individual differences should be considered [14].

Functional status, psychosocial characteristics and their association with quality of life have not been systematically assessed in the Hungarian dialysis population, whereas these data would be important to assess the need for appropriate psychosocial care and to identify high-risk patient groups for targeted psychosocial intervention. The Board of the Hungarian Society of Nephrology, therefore, decided to organize this cross-sectional survey to assess the frequency of psychosocial problems, functional impairments and disability and their association with sociodemographic characteristics of patients requiring maintenance dialysis in Hungary. The association between the above characteristics versus self-rated health status, a marker of HRQoL, was also analyzed.

Subjects and methods

Sample of patients and data collection

All chronic dialysis patients 18 years or older (n = 4,321) receiving dialysis for at least 1 month in any of the dialysis centers in Hungary (n = 56) on May 1, 2006 were approached to participate in a national, cross-sectional survey. Data were collected between July 1, 2006 and September 30, 2006.

Participants completed a brief self-reported questionnaire. Assistance to complete the questionnaire was available upon request by the patient. Questionnaires were completed during the dialysis sessions.

The study was approved by the Ethics Committee of Semmelweis University Budapest. Before enrollment, the patients received detailed written and verbal information regarding the aims and protocol of the study and signed informed consent.

Sociodemographic parameters collected were: age, gender, level of education, marital status, occupational status, living status and perceived financial situation (good, fair, poor). Dialysis-related data included dialysis modality (hemodialysis or peritoneal dialysis), dialysis "vintage", i.e., time elapsed since starting dialysis treatment and transplantation wait-listing status.

Patients were asked if they had ever had any of the following conditions: acute myocardial infarction (AMI), cerebrovascular disease, diabetes mellitus and limb amputation at any level.

We also asked patients if they suffered from visual or hearing impairments, or had significant problems with mobility. Answers were measured on a Likert scale, with possible answers as following: Not at all, Somewhat, Moderately, Very much, I don't know. Limitations of activities of daily living (difficulties in climbing stairs, walking, bathing and getting dressed) were assessed by items from the Physical Functioning subscale of the SF-36 questionnaire.

Assessment of depressive symptoms

Two questions, "Have you often been bothered by feeling down, depressed, or

Table 1.   Characteristics of the Hungarian chronic dialysis population by gender.

Characteristic	Total sample (n = 3,563)	Women (n = 1,696)	Men (n = 1,858)	p value
Age, years (mean ± SD)	62 ± 14	64 ± 14	60 ± 14	< 0.001
Level of education (%)				< 0.001
≤ 8 y	43.5	57.8	30.3	
8 – 12 y	45.4	34.8	55.0	
> 12 y	11.1	7.3	14.6	
Marital status (%)				
Married or common-low	56.9	43.1	69.4	< 0.001
Living status (%)				< 0.001
Alone	18.0	24.3	12.3	
With family	79.2	72.4	85.3	
In institution	2.8	3.3	2.4	
Self-reported financial situation (%)				0.02
Good	39.4	36.8	41.8	
Fair	40.1	42.3	38.2	
Poor	20.4	20.9	20.0	
Occupation (%)				0.04
Full-time employed	2.8	1.5	3.9	
Part-time employed	3.1	1.4	4.6	
Homemaker	1.2	2.1	0.3	
Retired	46.3	53.2	40.0	
Disability pension	46.1	41.5	50.4	
Unemployed	0.5	0.3	0.8	
Occupation < 65 y (%)				0.001
Full-time employed	5.0	3.1	6.3	
Part-time employed	5.4	3.1	7.2	
Homemaker	1.4	2.8	0.4	
Retired	14.0	17.0	11.8	
Disability pension	73.3	73.6	73.0	
Unemployed	0.9	0.4	1.2	
Comorbidities (presence, %)				
Diabetes	30.2	30.7	29.8	NS
Acute myocardial infarction	19.0	16.1	21.7	< 0.001
Cerebrovascular disease	18.8	19.3	18.4	NS
Limb amputation	8.4	5.9	10.7	< 0.001
Limitations in everyday activities (%)				
Walking without help	58.4	65.3	52.1	< 0.001
Climbing stairs	68.4	75.0	62.4	< 0.001
Bathing/clothing without help	43.9	51.0	37.3	< 0.001
Functional impairments (%)				
Mobility	44.1	48.7	39.9	< 0.001
Visual	43.8	49.4	38.8	< 0.001
Auditory	17.2	17.2	17.2	NS
Total time on dialysis, months				
median (interquartiles range, IQR)	30 (46)	32 (50)	28 (42)	0.003
Transplantation waitlisting (%)	19.2	14.8	23.1	< 0.001
Renal replacement therapy modality (%)				NS
Hemodialysis	92.9	93.6	92.2	
Peritoneal dialysis	7.1	6.4	7.8	

hopeless?" and "Is this something which you would like help for?" were used to detect depressive symptoms.

Previously, a screening tool for depression using two questions from the original Primary Care Evaluation of Mental Disorders (PRIME-MD) questionnaire [17] has been developed to screen major depression in primary care settings. These questions had good sensitivity and specificity for depression [18]. Arroll et al. have since extended these questions by adding a help question

and validated this simple tool; positive response to either screening question plus the help question had a sensitivity of 96% and a specificity of 89% [19].

Assessment of self-rated health

The Hungarian version of the EuroQol Visual Analog Scale (EQ VAS) was used to measure self- perceived health of patients. On this 20 cm scale the respondent rates his/her health state by drawing a line from the box marked "Your health state today" to the appropriate point on the EQ VAS (0-100). The EQ VAS [20] records the respondent's self-rated health on a vertical scale where the extremes of the scale are labeled "Best possible health" and "Worst possible health".

Statistical analysis

Statistical analysis was carried out using the SPSS 13.0 software. Continuous variables were compared using Student's t-test or the Mann–Whitney U-test, and categorical variables were analyzed with the χ^2-test or Fisher exact-test, as appropriate. Correlation analysis was performed using Pearson correlation analysis.

The factors associated with the presence of depressive symptoms were examined using multivariate logistic regression. To analyze factors independently predicting self-rated health, multivariate linear regression with the EQ VAS score as dependent variable was used. Independent variables were selected on a theoretical basis in both models. Variables that are known to be associated with depressive symptoms and self-rated health status from previous research or based on clinical experience were entered into the models.

Results

Basic characteristics and socioeconomic status (SES)

758 (18%) of the 4,321 patients approached refused to participate or did not fill in the questionnaire completely (nonparticipants). Participants were somewhat younger than nonparticipants (62 ± 14 vs. 66 ± 15, p < 0.001) and more

likely to be male (52 vs. 47%, p < 0.01). No further data from nonparticipants were available for comparison. The final study population, therefore, consisted of 3,563 individuals.

Basic characteristics of the study sample are shown in Table 1. Elderly individuals over 60 years of age accounted for 60% and subjects over 70 years of age accounted for 33% of all chronic dialysis patients enrolled in this survey (not shown).

Only 6% of the sample and 10% of patients younger than 65 years old had full- or part-time jobs (Table 1). Patients with less education were more likely to report poor financial situations (23% vs. 16% vs. 10%, education ≤ 8 y vs. 8 – 12 y vs. > 12 y, respectively, p < 0.001).

25% reported that they may not fill their prescriptions occasionally because of lack of money. Both poor self-reported financial situations (50% vs. 27% vs. 10% for poor vs. fair vs. good self-reported financial situation, respectively, p < 0.001) and less education (30% vs. 23% vs. 15% for ≤ 8 y vs. 8 – 12 y vs. > 12 y, respectively, p < 0.001) were associated with not filling prescriptions for financial reasons.

Dialysis modality and transplant waitlisting

Median (interquartile range, IQR) dialysis vintage was 32 (50) vs. 28 (42) months in women vs. men (p = 0.003). 7% of all participants were on peritoneal dialysis (PD). There were no gender differences in the modality of renal replacement therapy. Patients on PD, however, were better educated (> 12 y: 17% vs. 11%, ≤ 8 y 26% vs. 45% for PD vs. HD, respectively; p < 0.001) and were more likely to report better financial situations (good: 48% vs. 39%; poor: 12% vs. 21% for PD vs. HD, respectively; p < 0.001).

Significantly more men vs. women (23% vs. 15%, p < 0.001) were on the transplant waitlist. Male gender (odds ratio (OR) and 95% confidence interval (CI): 1.46 (1.19 – 1.8) and having more than 8 years of education (OR (95%CI): 1.90 (1.50 – 2.33)) were significantly associated with greater odds of being waitlisted even after adjustment for age, presence of diabetes, history of AMI and stroke.

Table 2. Predictors of having depressive symptoms – logistic regression model.

	AOR	95% CI for AOR		p value
Age (1 year increase)	0.994	0.987	1.001	0.09
Gender (female vs. male)	1.42	1.19	1.69	< 0.001
Self-reported financial situation				
Good	1			Ref
Fair	1.45	1.21	1.74	< 0.001
Poor	1.59	1.27	1.98	< 0.001
Education (y)				
8 or less	1.96	1.62	2.379	< 0.001
9 – 11	1.53	1.23	1.904	< 0.001
12 or more	1			Ref
Family situation				
married/spousal relationship	1			Ref
never married	1.13	0.84	1.54	0.41
divorced/widowed	1.29	0.92	1.81	0.13
RRT modality (HD vs. PD)	1.38	0.995	1.91	0.05
Dialysis vintage (1 month increase)	0.998	0.996	1.00	0.05
Comorbidities (presence vs. absence)				
Diabetes	1.11	0.93	1.81	0.25
Acute myocardial infarction	1.32	1.07	1.62	0.009
Stroke	1.34	1.09	1.65	0.006
Limb amputation	1.23	0.91	1.67	0.18
Impairments (presence vs. absence)				
Visual	1.36	1.15	1.62	< 0.001
Hearing	1.59	1.27	1.98	< 0.001
Limitations in everyday activities (presence vs. absence)				
Bathing/clothing	1.44	1.22	1.71	< 0.001

AOR = adjusted odds ratio, 95% CI = 95% confidence interval.

Functional limitations, depression and self-rated health

44% of the patients reported moderate or severe impairment of their mobility. The frequency of moderate-severe visual impairment was 44%, and 17% of the participants reported moderate-severe hearing impairment. Almost half of the population (44%) reported that they needed help with bathing or getting dressed (Table 1). More female patients versus males reported limitations in these activities (Table 1).

46% of all patients reported having depressive symptoms. 16% of the participants would have wanted help for their mood problems. Patients with depressive symptoms were significantly older (63 ± 14 y vs. 61 ± 14 y, respectively, p = 0.001). The proportion of patients reporting depressive symptoms was significantly higher in women vs. men (53% vs. 40%, p < 0.001) and among sin-gle/separated/widowed vs. married patients (50% vs. 43%, respectively; p < 0.001).

The mean ± SD EQ VAS score was 55 ± 21 in our sample. Men reported significantly better self-rated health than women (mean ± SD EQ VAS score 56 ± 20 vs. 54 ± 21, p < 0.001). EQ VAS score showed a weak but significant negative correlation with age (rho = −0.166, p < 0.001). Patients who reported depressive symptoms had significantly lower scores on EQ VAS (48 ± 20 vs. 61 ± 19, for patients with vs. without depressive symptoms, p < 0.001).

Multivariate analysis

A logistic regression model was built to assess the independent association between the presence of depressive symptoms (dependent variable) versus socio-demographic and clinical characteristics. In this multivariate regression model female gender, poor self-reported finances, less education, history of AMI or stroke, presence of visual or hearing impairment and difficulties with basic activities of daily living were significantly and independently associated with the presence of depressive symptoms (Table 2).

In a multivariable linear regression model, we also analyzed independent associations between the above independent variables and the presence of depressive symptoms versus self-rated health status assessed by the EQ VAS. In this model, age, dialysis vintage, history of AMI or stroke, the presence of visual or hearing impairments, limitations with bathing and also having depressive symptoms were significantly and independently associated with the EQ VAS score (Table 3).

Discussion

In this large, cross-sectional survey of prevalent dialysis patients we demonstrated that a substantial proportion of the Hungarian dialysis population is characterized by advanced age, multiple comorbidities and reported significant impairments and limitations in activities of daily living. These characteristics, which are components of the "frailty phenotype" together with disadvantaged social status are associated with the

Table 3. Predictors of self-rated health status (EuroQol-Visual Analog Scale) – linear regression model.

	Beta	95% CI for beta		p value
Age	−0.06	−0.15	−0.04	0.001
Gender	0.01	−0.95	1.98	0.49
Self-reported financial situation	−0.03	−1.79	0.08	0.07
Education (y)	−0.02	−0.67	0.15	0.22
Family situation	−0.02	−1.89	0.62	0.32
RRT modality (HD vs. PD)	0.018	−1.27	3.93	0.32
Dialysis vintage (1 month increase)	−0.06	−0.87	−0.27	< 0.001
Diabetes	−0.03	−3.05	0.07	0.06
Acute myocardial infarction	−0.03	−3.62	−0.14	0.03
Stroke	−0.05	−4.60	−1.13	0.001
Limb amputation	−0.03	−4.91	0.09	0.06
Visual impairment	−0.06	−4.14	−1.23	< 0.001
Hearing impairment	−0.05	−4.63	−0.90	0.004
Limitations with bathing/clothing	−0.18	−9.07	−6.13	< 0.001
Presence of depressive symptoms	−0.24	−11.46	−8.65	< 0.001

95% CI = 95% confidence interval.

presence of depressive symptoms and poor self-rated health status, a marker of impaired quality of life.

In the last decades, an aging population and the increase in incidence of Type 2 diabetes mellitus undoubtedly contributed to a rapid increase in the prevalence of ESRD both in North America and in Western Europe. This trend has only rarely been documented in the Central and Eastern European countries. Similar to international trends, more and more elderly people are being recruited into RRT programs [21, 22]. The sociodemographic characteristics of our cohort are similar to those reported for other European [22, 23] and US populations [24, 25].

The socioeconomic status of Hungarian dialysis patients based on our survey is poor, similarly to data published in the recent ANSWER study [23]. Chronic dialysis patients in Hungary are less educated compared to the general population and frequently have to face financial difficulties that may affect their ability to buy prescribed medications. Given the unfavorable economic changes that have taken place since our data collection, the situation has likely worsened substantially.

The relatively poor vocational rehabilitation of the study sample is clearly an important contributor to the overall problem. Only a small proportion of the Hungarian dialysis patients was employed. Our findings are similar to those found by others among hemodialysis patients [23, 26]. Younger age and better education are universally associated with better vocational rehabilitaton. Having a job, in turn, is importantly associated with lower risk of depression and better HRQoL [27, 28]. These results clearly call for concerted effort to improve vocational rehabilitation of patients with CKD.

1/5 of the patients reported poor or very poor financial situations. As expected, patients with less education were more likely to report poor financial situations. In the study of Dobrof et al. [26], financial problems were associated with missing treatments, cutting dialysis time and increased intradialytic weight gain.

Diabetes affected were 1/3 of our patients, similarly to other European studies [23, 29] but substantially less than in the US [30]. The proportion of patients with the history of AMI and cerebrovascular diseases was almost twice as high in our sample than in France or Spain [23, 29], but similar to that reported in the US [25, 30]. However, the differences in these proportions must be viewed with caution, as they may be related to different disease definitions or methods of data ascertainment and collection.

There is a high prevalence of disability in dialysis populations, and a large number of patients suffer from one or more conditions that significantly limit them in their daily activities. These conditions adversely affect functional status and HRQoL and are not fully corrected (if at all) by dialysis [10]. Due

to the advanced age of the study sample and high proportion of preexistent comorbidities, the functional status was moderately affected, consistent with previous findings [23, 26, 30]. A substantial number of the participants reported moderate or severe mobility, visual or hearing impairments and almost half of the population reported that they needed help with even basic activities of daily living. These limitations are important components of "frailty" and identify patients with significantly increased risk of poor outcome. Functional assessment is considered the "cornerstone" of rehabilitation, identifying deficits in functioning for which individualized therapy or rehabilitation regimens can be devised [11].

Almost half (46%) of our chronic dialysis population reported having depressive symptoms. This prevalence was comparable with results reported by the DOPPS [1], but more than three-fold higher than that reported from the Hungarian general population [31]. Previously, Szeifert et al. [31] reported that the prevalence of depressive symptoms was 33% in a cohort of Hungarian waitlisted dialysis patients, which could be explained by the younger age and better health status of waitlisted individuals.

Corresponding with earlier results [1, 31], female gender, lower socioeconomic status and the presence of comorbid conditions were significantly and independently associated with the presence of depressive symptoms. Functional impairments and limitations were also significant predictors of the presence of depressive symptoms.

The same variables, together with the presence of depressive symptoms, were significant predictors of the EQ VAS score. Older patients reported lower perceived functioning in several earlier studies, as well [11, 32].

Elderly individuals, particularly women living alone, with low socioeconomic status and multiple preexisting comorbidities are at the highest risk of having depression and poor HRQoL. They are in dire need of appropriate, professional psychosocial support which, if delivered, could reduce disease burden and improve HRQoL. Functional independence is enhanced by rehabilitation [28]. In the study of Curtin et al, rehabilitation was associated with higher mean SF-36 Mental Component Scale (MCS) scores,

even after controlling for patient demographic characteristics (diabetes, race, sex, age), and laboratory variables (urea reduction ratio and hemoglobin and serum albumin levels) [28]. Depressive symptoms are also treatable by psychotherapy or antidepressants. Cukor conducted a study on the psychotherapy treatment of depression in patients with CKD. The therapy significantly reduced depressive symptoms measured by the Beck Depression Inventory, and this effect was maintained for 3 months [33]. In another study, hemodialysis patients with major depression were randomly assigned to fluoxetine or placebo. There was a statistically significant improvement in depression at 4 weeks [34].

Our survey is notable for the large number of participants. In fact, we approached all adult patients who received dialysis for at least one month in Hungary. We collected information about a broad spectrum of potential psychosocial and functional areas which are important and relevant to the overall functional status and well-being of the patients.

Several limitations of this survey also have to be noted. We had not collected laboratory data or information about comorbidity from medical records. Most of the data collected were based on self-report.

We believe, however, that the information gathered and the results obtained from our analysis provide insight into the substantial difficulties these patients have to cope with and reinforce the need for structured professional psychosocial support to help patients on maintenance dialysis. Unfortunately, however, such care is currently very limited for this patient population in Hungary. A unique aspect of dialysis care in Hungary is that dialysis is almost exclusively (> 90%) provided by private for-profit dialysis chains. Since dialysis is publicly funded, universal access is not jeopardized. However, coordination and connections between the private providers and the public system is far from being seamless. Therefore, patients receiving dialysis care in a private dialysis unit may not have easy acces to the psychosocial support system, which is also very limited in the public system. The private dialysis providers do not employ social workers or psychologists since this service is not included in the dialysis treatment for which they receive

their reimbursment from the national insurance fund.

Efforts to provide the much-needed professional psychosocial care, in addition to the high-quality dialysis, need to be coordinated between dialysis providers, health-politicians and funding agencies in Hungary to improve clinical outcomes and the overall well-being of patients with advanced CKD.

Acknowledgments

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