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Brief communication

Determining the basic psychometric properties of the Greek KDQOL-SF™

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Abstract

The aim of this study was to determine the basic psychometric properties, i.e. reliability and validity, of the Greek version of the Kidney Disease Quality of Life Short Form (KDQOL-SF™). The instrument was self-administered to a homogenous group of 665 end stage renal disease patients in 20 dialysis units throughout Greece and the overall response rate was 72.6%. Reliability was demonstrated by Cronbach's alpha exceeding the recommended minimum value of 0.70 in all, except one, scales. Tests of item-internal consistency, after correction for overlap, resulted in correlations between items and their hypothesized scales, which exceeded the 0.40 standard in 94.5% of the cases. Item discriminant validity tests indicated 100% scaling success for six out of eight generic and disease-targeted scales. Validity was supported by the confirmation of expected correlations between scales and the overall health-rating item included in the instrument and with sociodemographic and self-reported health variables. Multiple stepwise linear regression analysis demonstrated that all disease-targeted scales were important predictors of SF-36 general health scales and the variance explained ranged from 37% to 57%. Overall, the psychometric properties of the KDQOL-SF™, resulting from this first-time administration of the instrument to a Greek dialysis population, were good and the disease targeted scales were informative and of high internal consistency reliability. Cross-sectional construct validity is demonstrated, despite the lack of external validity criteria based on clinical ratings of severity. The results support administering the Greek KDQOL-SF™ in studies evaluating dialysis therapy and contribute to transnational comparison of findings.

Key words: Dialysis, Greece, Health-related quality of life, Reliability, Validity, SF-36, KDQOL-SF™

Introduction

The Kidney Disease Quality of Life instrument (KDQOL™) is a health-related quality of life (HRQOL) measure, specifically designed for self-administration to dialysis patients. Details on the structure and the development of the original (US-English) version are reported elsewhere [1]. Despite being valid and reliable, its length (134 items) has made many researchers hesitant to use it. Therefore, items were selected to create a shorter questionnaire widely known as the Kidney Disease Quality of Life Short Form (KDQOL-SF™) [2]. This instrument includes a generic core of 36 items – the Short Form Health Survey (SF-36) – as well as 43 kidney-disease-targeted items and an overall health-rating item. The SF-36, consisting of eight generic health scales, has been developed in the Medical Outcome Study in the United States [3] and the Greek version has been found valid and reliable [4]. The 43 additional items focus on particular health-related concerns of individuals with end-stage renal disease (ESRD) on dialysis, and were assigned to eight kidney disease-targeted scales and three additional quality of life scales, mainly addressing satisfaction. The KDQOL-SF™ has been translated into many languages, Greek as well, according to documented procedures of the KDQOL working group[1] and complying with international guide-

[1]Information regarding translation and translated versions of the KDQOL-SF™ can be obtained from the website www.gim.med.ucla.edu/kdqol

lines pertaining to the translation of questionnaires [5–6]. The aim of this study was to determine the basic psychometric properties, namely internal consistency reliability and cross-sectional construct validity of the Greek KDQOL-SF^{TM} in order to enhance confidence in the equivalence of metrics and meaning and contribute to broader cross-cultural comparisons of results [7].

Methodology

Patients and data collection

The aim was to obtain a sample that would be as representative as possible of the Greek dialysis population. In the absence of a priori hypotheses about the effect of location, size or ownership status of dialysis facilities on patients' HRQOL, we randomly selected 20% of the sites (24 out of 122) currently operating throughout the country from which participants would be recruited. Eventually 20 facilities treating, on aggregate, 863 patients agreed to participate. Dialysis patients were eligible for inclusion on the basis of their mental and physical ability to read, comprehend and answer questions posed by a self-administered questionnaire. Based on these criteria, medical and nursing personnel handpicked 665 patients who were consecutively approached to complete the questionnaire. The final sample consisted of 483 respondents (response rate 72.6%), corresponding approximately to 7% of the entire Greek dialysis population. The review boards at each institution granted ethical permission for the study. The questionnaire was distributed by a nurse along with a letter explaining that participation was voluntary, the confidentiality and anonymity of the results and that a decision not to participate would not affect, in any way, the care offered. This ensured informed consent from all patients. The questionnaire consisted of a set of common sociodemographic and health-related questions and the KDQOL-SF^{TM} psychometric instrument and required approximately 20–25 min for completion.

Psychometric tests for scaling assumptions

For each of the instrument's 19 scales, the percentage of respondents completing at least 50% of the items was calculated. The score distributions were evaluated by computing the percentage of respondents achieving either floor or ceiling scores, which is an indication of the ability to detect changes over time. Tests of scaling assumptions examined the item-scale correlations and were used to confirm the hypothesized scale structure. These tests included item internal consistency which is substantial and satisfactory when correlation between an item and its hypothesized scale (corrected for overlap) is at least 0.40 and item discriminant validity which is successful when the correlation between an item and its own scale is significantly higher, by two standard errors or more, than with other scales [8]. The internal consistency reliability of each scale was calculated using Cronbach's alpha and the 0.70 standard for group-level comparisons was adopted [9].

Validity

The reliability and validity of various types of rating scales has been demonstrated [10–11]. In this study, construct validity was initially assessed from the correlations between the scales and the overall-health rating item, included in the KDQOL-SF^{TM}, and having previously hypothesized that generic and disease-targeted scales would have higher correlations with the rating item than the three satisfaction scales. It is also acknowledged that disease-specific scales are more responsive, than generic ones, to subtle and clinically important changes in HRQOL that may occur within a specific disease state [12]. Therefore, we measured correlations and performed linear regression analysis to identify the disease-targeted scales that were significant in explaining each SF-36 subscale. Finally, we performed tests of "known groups" validity by comparing mean scale scores across groups known to differ, using sociodemographic and self-reported health indicators as the differing criteria. Specifically, we expected that comorbidities reflecting the presence of physical or mental conditions and past-year hospitalizations reflecting additional burden on health would correlate negatively with generic and disease-targeted scales. It was also assumed that men would report better health than women and that age and education would be important health status factors, negatively and positively correlating to HRQOL, respectively [13–15].

Results

Socio-demographic and health-related characteristics are given in Table 1. The majority was male respondents (61.2%) and the mean age, for the whole sample, was 59.9 years. Almost half had completed only primary school and 14.4% had a university education. Most patients were married and 35.2% were currently employed. The average time on dialysis treatment was 6.9 years and one third was on the transplant list. One out of 10 patients had undergone an unsuccessful transplantation and had returned to dialysis, half had been hospitalized at least once over the past year for reasons attributed to ESRD and 55.9% reported suffering from at least one co-morbid condition, mostly cardiovascular disease.

The central tendency, variability and reliability of the KDQOL-SF^{TM} scales are presented in Table 2. The percentage of valid responses was high in all scales except for sexual function. Two generic scales, role physical and role emotional, suffered from high percentages of floor scores and, on the disease-targeted side, work status demonstrated high floor scores as well. Only one scale did not meet the 0.70 internal consistency criterion, namely social interaction on the disease-specific side of the instrument.

Significantly higher item-scale correlations were observed between items and their hypothesized scales than with competing scales (Table 3), and the 0.40 criterion was satisfied for all except one generic and three disease-targeted items, producing an overall success rate of 94.5%. Item discriminant validity tests indicated maximum (100%) scaling success rates for six of eight generic and disease-targeted scales. The most obvious scaling failure observed was in the social interaction scale.

All correlations between generic and disease-targeted scales of the questionnaire, presented in Table 4, were positive and significant ($P < 0.01$). Correlations between generic and satisfaction scales were generally weaker and only two, social support and patient satisfaction, demonstrated significant correlations with SF-36 scales summarized in the mental health component (vitality, social functioning, role emotional and mental health). Multiple stepwise linear regression analysis identified the disease-targeted scales that were significant, at the $P < 0.05$ level, in explaining each SF-36 subscale (Table 5). The analysis demonstrated high explanatory power for all models ranging from 37% for the physical role limitations scale to 57% for the mental health scale.

Concerning validity, the initial hypotheses were confirmed. All generic and disease targeted scales demonstrated fairly strong and significant correlations with the overall-health rating item ($P < 0.01$) and Pearson's r ranged from 0.36 to 0.62. Controlling for sex and age, men scored

Table 1. Characteristics of the sample (N = 483)

Demographics	N (% valid)	Health-related data	N (% valid)
Gender (male)	295 (61.2)	Primary kidney disease	
Age (mean ± SD)	59.85 ± 14.55	Glomerulonephritis	100 (22.5)
Education		Polycystic kidney	58 (13.1)
Primary school	211 (47.4)	Hypertension	100 (22.5)
Secondary school	65 (14.6)	Diabetes	52 (11.7)
High school	105 (23.6)	Other	74 (16.8)
University	64 (14.4)	Unknown	60 (13.4)
Family status		Years on HD (mean ± SD)	6.91 ± 5.66
Single	76 (15.9)	On transplantation list	158 (33.3)
Married	332 (69.5)	Previous unsuccessful transplant	46 (10.5)
Divorced/Separated	23 (4.8)	Co morbidity	
Widowed	47 (9.8)	Cardiovascular disease	99 (36.7)
Occupational status		Diabetes	73 (27.0)
Unemployed/Retired	240 (49.8)	Physical impairment	25 (9.3)
Employed	169 (35.2)	Other	73 (27.0)
Keeping house/Student	72 (15.0)	One or more renal disease attributed hospitalizations over the past year	157 (49.4)

Table 2. Central tendency, variability and reliability of the KDQOL-SF™ scales

	No. of Items	% N Valid	Mean (SD)	95% CI	Median	Floor (%)	Ceiling (%)	Reliability[1]
General Health Scales								
Physical functioning	10	94.6	45.44 (30.24)	42.66–48.22	45.00	9.4	2.2	0.93
Role physical	4	92.5	35.16 (42.91)	31.17–39.15	0.00	52.1	26.2	0.92
Bodily pain	2	98.8	58.30 (33.44)	55.29–61.31	54.00	5.9	28.9	0.92
General health	5	93.8	36.32 (21.67)	34.32–38.32	35.00	3.3	0.2	0.74
Vitality	4	96.3	46.43 (25.38)	44.11–48.74	45.00	3.7	1.3	0.86
Social functioning	2	98.6	55.83 (30.92)	53.05–58.61	50.00	6.3	17.9	0.77
Role emotional	3	90.9	46.01 (45.30)	41.76–50.26	33.33	43.5	36.9	0.90
Mental health	5	95.7	53.89 (23.84)	51.71–56.07	56.00	0.9	3.0	0.84
Disease-Targeted Scales								
Disease symptoms	12	94.2	70.12 (18.63)	68.40–71.84	70.83	0.2	2.0	0.86
Disease effects	8	97.1	48.77 (22.68)	46.71–50.83	50.00	0.6	0.2	0.83
Disease burden	4	96.5	38.64 (27.79)	36.11–41.17	34.38	12.0	3.0	0.80
Work status	2	98.3	20.42 (35.04)	17.26–23.58	0.00	71.6	12.4	0.71
Cognitive function	3	95.4	74.49 (23.58)	72.33–76.65	80.00	0.7	23.0	0.82
Social interaction	3	96.1	71.30 (21.95)	69.30–73.30	73.33	0.9	13.6	0.59
Sexual function	2	47.0	62.28 (34.80)	57.73–66.83	75.00	11.5	32.2	0.97
Sleeping	4	97.7	61.85 (21.57)	59.90–63.80	62.50	0.2	4.2	0.79
Satisfaction Scales								
Social support	2	97.9	82.17 (22.45)	80.14–84.20	83.33	2.1	46.1	0.68
Staff encouragement	2	97.9	90.62 (16.50)	89.13–92.11	100.00	0.2	66.8	0.75
Patient satisfaction	1	98.6	80.25 (23.67)	78.12–82.38	83.33	2.5	45.4	NA[2]

[1] Expressed as Cronbach's alpha
[2] NA – Not applicable for a single item measure

Table 3. Summary results of scaling assumption tests

	N[1]	Item-Internal Consistency		Item-Discriminant Validity	
		Range of Correlations[2]	Success /Total[3]	Range of Correlations[4]	Success Rate (%)[5]
General Health Scales					
Physical functioning	10	0.51–0.83	10/10	0.11–0.60	100
Role physical	4	0.77–0.85	4/4	0.18–0.64	100
Bodily pain	2	0.85	2/2	0.32–0.61	100
General health	5	0.38–0.69	4/5	0.04–0.63	82.5
Vitality	4	0.59–0.75	4/4	0.26–0.65	100
Social functioning	2	0.63	2/2	0.23–0.64	93.8
Role emotional	3	0.74–0.84	3/3	0.17–0.65	100
Mental health	5	0.56–0.72	5/5	0.16–0.61	100
Disease-Targeted Scales					
Disease symptoms	12	0.37–0.68	11/12	0.08–0.51	100
Disease effects	8	0.47–0.67	8/8	0.05–0.59	96.4
Disease burden	4	0.52–0.69	4/4	0.24–0.54	100
Work status	2	0.57	2/2	0.14–0.44	100
Cognitive functioning	3	0.63–0.73	3/3	0.13–0.58	100
Social interaction	3	0.31–0.49	2/3	0.02–0.61	76.2
Sexual functioning	2	0.94	2/2	0.22–0.49	100
Sleeping	4	0.35–0.73	3/4	0.22–0.46	100

[1] Number of items and number of item-internal consistency tests per scale
[2] Range of correlations between items and hypothesized scale corrected for overlap
[3] Number of correlations exceeding the 0.40 standard/total number of correlations
[4] Range of correlations between items and other scales
[5] Percentage of successful discriminant validity tests.

Table 4. Pearson's correlation coefficients between SF-36 and disease specific scales

General Health Scales	Disease-Targeted Scales								Satisfaction Scales		
	DS	DE	DB	WS	CF	SI	SX	SL	SS	SE	PS
PF	0.55**	0.49**	0.53**	0.44**	0.37**	0.36**	0.51**	0.42**	0.07	−0.14**	0.03
RP	0.47**	0.39**	0.45**	0.38**	0.34**	0.32**	0.29**	0.32**	0.06	0.01	0.10*
BP	0.64**	0.49**	0.48**	0.37**	0.48**	0.45**	0.41**	0.44**	0.11*	0.04	0.05
GH	0.44**	0.58**	0.61**	0.30**	0.48**	0.43**	0.28**	0.42**	0.22**	0.06	0.16**
VT	0.65**	0.53**	0.62**	0.42**	0.51**	0.46**	0.39**	0.49**	0.16**	0.02	0.13*
SF	0.46**	0.52**	0.56**	0.32**	0.57**	0.57**	0.40**	0.38**	0.21**	0.07	0.12**
RE	0.47**	0.46**	0.52**	0.33**	0.45**	0.41**	0.32**	0.43**	0.18**	0.02	0.12*
MH	0.53**	0.58**	0.66**	0.30**	0.59**	0.64**	0.37**	0.50**	0.29**	0.10*	0.19**

**$P < 0.01$, *$P < 0.05$

Abbreviations: PF: Physical Functioning; RP: Role Physical; BP: Bodily Pain; GH: General Health; VT: Vitality; SF: Social Functioning; RE: Role Emotional; MH: Mental Health; DS: Disease symptoms; DE: Disease effects; DB: Disease burden; WS: Work status; CF: Cognitive function; SI: Quality of social interaction; SX: Sexual function; SL: Sleep; SS: Social support; SE: Staff encouragement; PS: Patient satisfaction.

Table 5. Multiple stepwise linear regression models

SF-36 Scales	Predictors	B	SE	*t*	Sig	R^2
PF	DS	0.41	0.10	4.33	0.000**	0.48
	WS	0.19	0.05	3.83	0.000**	
	SX	0.19	0.04	4.31	0.000**	
	DE	0.22	0.08	2.61	0.010*	
RP	DS	0.73	0.17	4.42	0.000**	0.37
	DB	0.22	0.13	1.69	0.093	
	WS	0.21	0.07	2.93	0.004**	
	SI	0.42	0.16	2.63	0.009**	
BP	DS	0.86	0.09	9.69	0.000**	0.54
	SI	0.40	0.09	4.44	0.000**	
	SX	0.17	0.05	3.55	0.000**	
GH	DB	0.37	0.06	6.68	0.000**	0.38
	DE	0.21	0.07	2.99	0.003**	
VT	DS	0.54	0.07	7.40	0.000**	0.54
	DB	0.27	0.05	5.14	0.000**	
	WS	0.08	0.03	2.35	0.019*	
SF	CF	0.38	0.10	3.97	0.000**	0.51
	SX	0.15	0.04	3.63	0.000**	
	SI	0.38	0.09	4.23	0.000**	
	DS	0.31	0.09	3.41	0.001**	
RE	DS	0.66	0.17	3.80	0.000**	0.41
	DB	0.43	0.12	3.62	0.000**	
	SL	0.50	0.16	3.22	0.001**	
MH	DB	0.25	0.05	4.78	0.000**	0.57
	SI	0.30	0.07	4.24	0.000**	
	DS	0.24	0.07	3.33	0.001**	
	CF	0.18	0.07	2.42	0.016*	

**$P < 0.01$, *$P < 0.05$

Abbreviations: PF: Physical Functioning; RP: Role Physical; BP: Bodily Pain; GH: General Health; VT: Vitality; SF: Social Functioning; RE: Role Emotional; MH: Mental Health; DS: Disease Symptoms; DE: Disease effects; DB: Disease burden; WS: Work status; CF: Cognitive function; SI: Quality of social interaction; SX: Sexual function; SL: Sleep.

higher and age was negatively correlated with health on all scales. Differences were also observed with education as the criterion, with more years of education associated with better-reported health. As for the health indicators, comorbidities and hospitalizations were, as expected, negatively correlated with all scales. Parametric tests (*t*-test, ANOVA) showed that all the observed differences mentioned above were statistically significant ($P < 0.05$). The results are shown in Table 6.

Discussion

The aim of this study was to determine the basic psychometric properties of the Greek KDQOL-SF^{TM} and validate its use in studies with Greek samples. The eight SF-36 scales have already been shown to be psychometrically sound in a representative sample of the healthy Greek population [4], and the present findings indicate that they can also be used to study dialysis patients. The mean scores of the SF-36 scales were, as expected, lower than those derived from the study mentioned above and in close proximity to those from other studies involving dialysis patients [16–17]. The disease-targeted scores were also closely associated with findings reported elsewhere [18–21].

The high percentage of floor scores in two generic scales – role physical and role emotional – is an indication of their limited discriminant ability and pose a potential threat to responsiveness as well. These scales contain four and three dichotomous (yes/no) items respectively, implying that the limited number of possible response categories results in higher floor percentages in disease groups and higher ceiling effects in healthy populations [22]. Work status also suffered from a high percentage of floor scores and a possible explanation could be the high average age of the respondents (60 years) in conjunction with their limited ability to work because of their condition. However, this scale contains two dichotomous questions making it also susceptible to the problems mentioned previously.

The same applies for the sexual function scale, which suffered from low response rate, a finding common in similar studies [23]. Dialysis patients

Table 6. Stratified KDQOL-SF^{TM} scores

	PF	RP	BP	GH	VT	SF	RE	MH	DS	DE	DB	WS	CF	SI	SX	SL
Sex																
Male	50.0	40.1	64.8	40.1	49.9	60.3	49.6	57.9	73.0	51.4	40.8	25.9	77.5	72.9	65.9	63.4
Female	38.3	27.5	48.1	30.3	41.1	48.8	40.5	47.8	65.7	44.6	35.0	12.0	69.7	68.8	54.4	59.5
Age																
<45	66.1	49.8	70.6	40.4	58.1	67.1	63.3	57.7	76.9	53.0	47.6	46.6	79.9	73.5	84.3	73.8
45–65	50.7	41.9	63.3	36.0	50.9	61.0	51.2	55.9	72.6	49.0	39.6	20.3	75.1	73.5	64.0	61.0
>65	29.9	20.7	47.9	34.7	36.4	45.4	32.2	50.0	64.4	45.7	33.3	8.6	71.3	67.9	42.8	57.2
Education																
Primary	36.1	25.8	49.5	33.5	39.8	50.1	34.6	48.8	64.6	44.1	31.9	8.7	70.1	69.2	44.1	57.7
Secondary	49.7	31.8	57.1	33.9	48.9	55.8	46.6	53.4	71.5	46.2	36.9	15.4	70.0	69.0	72.9	60.3
High school	58.4	51.2	68.5	40.4	55.0	64.4	57.9	59.0	78.0	54.6	46.0	34.2	80.7	74.4	82.7	70.3
University	63.8	49.3	71.9	41.6	54.9	68.0	64.3	63.9	75.3	55.3	48.9	45.1	87.3	77.1	86.4	65.4
Comorbidities																
Yes	40.9	30.4	54.3	33.1	42.7	51.4	40.8	50.0	67.0	44.2	33.6	17.0	70.4	68.1	59.2	58.7
No	52.2	42.0	64.4	41.1	52.2	62.5	53.7	59.9	74.7	55.8	46.4	25.8	80.6	76.2	65.0	66.8
Hospitalizations																
None	56.9	49.9	70.7	39.0	54.7	64.8	59.0	60.7	77.9	52.8	45.7	32.0	80.8	75.6	87.3	67.1
One	50.0	33.8	59.7	37.5	47.8	55.6	39.0	53.7	72.2	45.4	35.9	23.7	73.2	72.4	73.2	62.0
Two	36.4	17.1	41.1	26.2	38.2	42.7	26.4	43.0	67.3	39.3	25.0	16.2	62.6	64.2	64.6	58.1
More	25.0	12.8	34.7	24.5	23.8	35.1	32.5	34.2	54.7	32.4	19.5	8.9	57.2	56.0	83.3	47.2

Abbreviations: PF: Physical Functioning; RP: Role Physical; BP: Bodily Pain; GH: General Health; VT: Vitality; SF: Social Functioning; RE: Role Emotional; MH: Mental Health; DS: Disease Symptoms; DE: Disease effects; DB: Disease burden; WS: Work status; CF: Cognitive function; SI: Quality of social interaction; SX: Sexual function; SL: Sleep.

commonly suffer from sexual dysfunction, increasing the overall psychological stress associated with the disease [24] and this perhaps is why they avoid discussing this issue. This could be evidence for removing the work status and sexual function items from the instrument when using the Greek version. International comparisons would not be affected because scale scores from the disease-specific part of the instrument are always reported separately, as opposed to those from the generic part, which can be summarized in a physical and a mental component score.

Scaling assumptions were confirmed and only one scale appeared ''problematic'', namely the one intended to measure the quality of social interaction, where the item ''did you get along well with other people'' did not meet the 0.40 internal consistency standard. A possible explanation is that this item is scored in the opposite direction compared to the surrounding items. Due to this, the reliability of the scale was 0.59, constituting it the only one not achieving the 0.70 reliability standard. In any case, the reliability of the social interaction scale of the original US version was 0.61, also below the recommended level [2]. In all other cases, reliability was acceptable and this provides firm evidence that each scale is measuring a distinct concept.

Use of the KDQOL-SF^{TM} has resulted in a greater explanation of those variables contributing to HRQOL, as defined by the SF-36 scales, in dialysis patients [25]. All linear regression analysis models showed a relatively high degree of variance explained (37%–57%) with disease related symptoms appearing to be a significant contributor in seven of eight generic scales. Although such symptoms are frequently uncontrollable, a systematic approach to minimizing them may prove beneficial in terms of HRQOL for the dialysis population. The same perhaps could be argued for disease burden and social interaction, which were significant in five and four models, respectively. Despite the above analysis, a large proportion of the variability of each SF-36 scale remains unexplained, since other demographic or health-related variables added little to the explanatory power of the regression models. This could trigger further research.

This study has some limitations that should be taken into account. Although internal consistency reliability and cross-sectional construct validity of the Greek KDQOL-SF^{TM} are fairly demonstrated, test-retest reliability and longitudinal construct validity and responsiveness have not been addressed. This is particularly important as the health status of dialysis patients changes and it is necessary to be able to detect these changes over time. Clinical validity was assessed using self-reported health indicators such as comorbidities and hospitalizations. Despite these being common validity determinants [26], it is possible that they confound the findings. It should also be noted that a Greek health authority did not mandate this study. This limited us in obtaining other information since facilities, protected by stringent confidentiality regulations, were not obliged to reveal patient-specific clinical data that could have been used as external validity criteria. Surpassing this obstacle, i.e. supporting validity with clinical ratings of severity along with the administration of the instrument to peritoneal dialysis and transplanted patients should be goals for future studies.

The representativeness of the sample, reflecting on the generalizability of the results, should also be taken into account. To be eligible for the study, dialysis patients had to be mentally and physically able for self-administration of the questionnaire. They also had to have sufficient education to read and understand the questions, implying that illiteracy affected eligibility to some extent. Furthermore, patients from ethnic minority groups were generally excluded due to their difficulties with the Greek language. These criteria eventually reduced eligibility by approximately 23%. Assuming minimal judgment errors, from staff, in selecting the participants and that eligibility and response rates would be similar throughout facilities, it is perhaps safe to say that our sample is representative of at least three-quarters of the Greek dialysis population. Providing the availability of resources, representativeness could be improved in future studies by employing personal interviews in order to include more physically and/or mentally handicapped patients and others requiring assistance due to illiteracy or language problems.

This was the first study attempting to determine the psychometric properties of the Greek KDQOL-SF^{TM}. The results were good and all scales, except for social interaction, were

informative and of high reliability and validity. Scaling assumptions were met, implying that the translation of items and response choices is appropriate and that scale scores derived from the Greek version could contribute to cross-cultural comparisons. It should be noted that we used scale scores, and not scale summaries. To further support construct validity with this patient population, future research could examine the factorial synthesis of the physical and mental component scores of the SF-36 and the extent to which the two-dimensional structure is replicated. In conclusion, it can be said that the combined use of generic and disease-targeted instruments is useful in this patient group as the former offers the opportunity of comparisons with other disease populations, while the latter is more sensitive in detecting the particular aspects of ESRD affecting HRQOL.

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