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The role of sociodemographic factors in health - related quality of life of patients with end - stage renal disease

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Abstract

Background: Renal failure is a chronic disease that can have serious effects on patients' quality of life (QoL).
Objective: Gender, age, education and marital status were investigated in end-stage renal disease patients. Specifically, the relationship of QoL and mental health to sociodemographic variables was examined.
Methodology: 144 patients in-centre haemodialysis (HD) and continuous ambulatory peritoneal dialysis (CAPD) were administered the World Health Organization QoL instrument (WHOQOL-BREF), the General Health Questionnaire (GHQ-28), the depression CES-D scale, the State-Trait Anxiety Inventory (STAI) and the Multidimensional Health Locus of Control scale (MHLC).
Results: Female patients reported lower scores in the *psychological* and *environmental* QoL domains and higher scores in the *Trait Anxiety* measure. Elder patients reported higher scores in the GHQ-28 sub-scale of *social dysfunction* and in the CES-D *depression* scale, while less educated patients presented higher scores in the GHQ-28 sub-scales of *anxiety/insomnia* and *severe depression*. Divorced/widowed patients presented lower scores in the *physical, social* and *environmental* QoL domains and higher scores in the *severe depression* sub-scale. Regarding health locus of control, females and less educated patients reported higher scores in the attitudinal dimension of *chance,* while younger patients in the dimension of *internal*.
Conclusions: Findings provide evidence that sociodemographic variables, like being female, older, less educated and divorced/widowed, relate to a more compromised QoL.

Key Words: sociodemographic factors, quality of life, haemodialysis, peritoneal dialysis, renal disease

Introduction

Renal failure is a chronic disease that can have serious effects on patients' quality of life (QoL) and specifically on their social, financial and psychological well-being (Griffin, 1994; Christensen & Ehlers, 2002; Ginieri - Coccossis et al. 2008; Karamanidou et al., 2009). As a result, an increased interest in QoL issues is observed for these patients in the context of different treatment modalities (Gokal, 1993; Kimmel et al., 1995).

Regarding the effect of sociodemographic variables on patients' QoL and mental health, gender is reported to have an effect; so female patients present higher scores of depression and trait anxiety and lower scores in positive affect (Vazquez et al., 2004; Gottlieb et al., 2004; Oikonomidou et al., 2005; Di Marco et al., 2006). Male patients are reported of having more social activities and interests and better QoL (Rebollo et al., 1998; Gil Cunqueiro et al., 2003; Vazquez et al., 2004).

Further, older patients present lower levels of physical well-being and higher scores of depression (Apostolou & Gokal, 2000; Kutner & Jassal, 2002; Dimkovic & Oreopoulos, 2002; Iacovides et al., 2002; Moshopoulou & Savidaki, 2003; Chiang et al., 2004; Tyrrell et al., 2005; Oikonomidou et al., 2005; Vasilieva, 2006). Regarding the effect of socioeconomic status, patients in the lower range face many problems, including poorer mental and general health and lower social well-being (Ellinikou & Zissi, 2002; Sesso, Rontrigues-Netto & Ferraz, 2003), whereas higher economic and educational level is associated with higher health-related QoL (Rebollo et al., 1998; Vazquez et al., 2003). Concerning marital status, being married is related to better physical well-being (Chiang et al., 2004).

In spite of the fact that several articles on QoL referring to end-stage renal disease patients have been published, the studies investigating the role of sociodemographic variables on QoL issues are limited and the produced findings are frequently controversial. The aim of this study was to investigate in a group of end-stage renal disease patients QoL differences and differences referring to self-reported mental health, depression and state-trait anxiety, as well as differences in beliefs of health locus of control, after controlling for gender, age, levels of education and marital status.

Research questions and hypothesis

The main hypothesis is that being male patient, younger, more educated and married relates to a better QoL and mental health.

Methodology

A sample of 144 patients was recruited from three General Hospitals in the broader area of Athens, consisting of 84 patients (58.3%) undergoing in-centre haemodialysis (HD) and 60 patients (41.7%) in continuous ambulatory peritoneal dialysis (CAPD). The rate of response was very high, reaching 99%.Thus, the total sample includes almost all patients of these three units, consisting of 86 males (59.7%) and 58 females (40.3%), with a mean age of 60.6 years ± 14.9. Participants were Greek adults having signed a consent form for participation. All subjects had been informed of their rights to refuse or discontinue participation in the study according to the ethical standards of the Helsinki Declaration in 1983. Ethical permission for the study was obtained from the scientific committees of the hospitals. Full descriptive data of the sample are presented in table 1. Measurements were conducted with the following instruments:

1) *WHOQOL-BREF* is a self-report 26-item QoL inventory developed by the World Health Organization (WHOQOL Group, 2004). The items comprise a 4-domain model: a) *physical health*, b) *psychological health*, c) *social relationships* and d) *environment*. Also, a facet of two items is included referring to *overall QoL/health.* The Greek version is a 30-item form with 4 new national items referring to: 1) nutrition, 2) satisfaction with work, 3) home life and 4) social life (Ginieri-Coccossis et al., 2003; Ginieri-Coccossis et al., 2006). Higher scores indicate a better QoL.

2) *General Health Questionnaire* (GHQ-28) version is a widely used self-report measure designed to detect psychiatric problems in general settings (Goldberg, 1978), which has been standardized in Greek populations (Garyfallos et al., 1991). It includes four sub-

scales: a) *somatic symptoms,* b) *anxiety/insomnia,* c) *social dysfunction* and d) *severe depression.* Higher scores indicate a worse general condition of health.

3) *Multidimensional Health Locus of Control* (MHLC) is a self-report tool measuring internal belief about current condition of health. It consists of 18 items that comprise four dimensions: a) *internal locus,* b) *chance,* c) *doctors* and d) *important others* (Wallston & Wallston, 1976; Wallston, Wallston & DeVellis, 1978). The last three dimensions refer to external health locus of control. Higher scores in one of the above dimensions indicate the patient's stronger belief that his/her condition of health is influenced by internal or external factors.

4) *State-Trait Anxiety Inventory* (STAI 1/STAI 2). It consists of 20 items referring to self-reported state anxiety and 20 items to trait anxiety (Spielberger, 1970). The instrument is standardized in Greek populations (Liakos & Giannitsi, 1984). Higher scores indicate the presence of state and trait anxiety.

5) *Center for Epidemiologic Studies Depression Scale* (CES-D) is a 20-item self-report measure of depression (Radloff, 1977; Hann, Winter & Jacobsen, 1999). According to Fountoulakis et al., it is suggested that for Greek populations a value above 9.03 is indicative that a subject can be classified as depressed (Fountoulakis et al., 2001).

Statistical analysis

Statistical analyses were performed with the use of Independent-Samples T Test and One-Way ANOVA in order to investigate differences between male and female patients, older (>45) versus younger (<45), less educated (<9 years of education) versus more educated (>9) and living with a partner or without.

Results

The values of the two gender groups were found to pass the normality distribution, with the use of Kolmogorov-Smirnov Z test. Investigating gender differences, female patients' QoL scores in the *psychological* and *environmental* domains were significantly lower compared to males (table 2). Also, they tended to report higher scores in the GHQ-28 sub-scale of *severe depression* (p=0.05) (table 2). Further, females reported significantly higher scores in the MHLC dimension of *chance,* indicating a stronger preference for *external* health locus of control, that is endorsing beliefs and attributions that external and unpredictable factors may influence their condition of health (table 2).

Further, women presented significantly higher scores than men in *trait anxiety* measured by STAI 2, while no statistically significant differences were found in *depression* measured by CES-D (table 2). It is noteworthy that regarding this scale, with the use of the above suggested cut off point, both male and female patients present higher values and can be considered as depressed (M=11.94 and 14.32 respectively).

Concerning age, statistically significant differences were found between younger (<45 years) and older patients (>45 years). Specifically, older patients reported a significantly higher level of *social dysfunction* and *depression* (table 3). Also, they tended to rely more on the *external* dimension of health locus of control, particularly, on their *doctors* (p=0.05) (table 3). This was further observed through correlational analysis with Pearson's coefficient r= 0.20, p= 0.01. On the other hand, younger patients reported significantly higher QoL scores in the *physical* and *psychological health*, and *social relationships* domains (table 3), and were found to rely significantly more on the *internal* dimension of health locus of control (table 3).

Regarding education, more educated patients (>9 years) presented significantly higher QoL scores in the *environmental* QoL domain (table 4). The less educated patients (<9 years) reported significantly higher scores in the *anxiety/insomnia* and *severe depression* sub-scales and in the *total GHQ-28 score* (table 4). Further, they indicated a significantly stronger *external* attributional style of health locus of control by endorsing more heavily the dimension of *chance* (table 4).

As far as marital status is concerned, divorced/widowed patients presented significantly lower QoL scores in the

overall QoL/health facet, as well as in the domains of *physical health, social relationships* and *environment*, compared to singles and married (table 5). Further, divorced/widowed patients presented significantly higher scores in the GHQ-28 sub-scale of *severe depression* (table 5).

Table 1. Sociodemographic characteristics of the sample (N= 144).

	Male N=86 (59.7%)	**Female N=58 (40.3%)**
Age (years) Mean (SD)	59.90 (16.88)	61.84 (11.68)
Marital status		
Single	18 (20.9%)	7 (12.1%)
Married	65 (75.6%)	42 (72.4%)
Divorced/Widowed/Roommate	3 (3.5%)	9 (15.5%)
Total	86 (100%)	58 (100.0%)
Education		
Elementary	29 (33.7%)	33 (56.9%)
Secondary	35 (40.7%)	21 (36.2%)
University	22 (25.6%)	4 (6.9%)
Total	86 (100.0%)	58 (100.0%)

Table 2. Mean scores ± SD of WHOQOL-BREF domains, GHQ-28 Health subscales, Health Locus of Control factors, Depression and State-Trait Anxiety. Independent-Samples T Test demonstrating differences between men and women.

WHOQOL-BREF domains	**(N=86) Men M ± SD**	**(N=58) Women M ± SD**	**p-value**
Physical	13.39 ± 3.40	12.70 ± 3.49	NS**
Psychological	14.12 ± 3.14	12.06 ± 3.51	**0.00***
Social relationships	13.53 ± 3.24	13.12 ± 3.01	NS
Environment	14.01 ± 2.48	13.05 ± 2.38	**0.02***
Overall QoL/health	3.11 ± 0.96	2.99 ± 1.00	NS
GHQ-28 subscales			
Somatic symptoms	1.73 ± 0.50	1.87 ± 0.60	NS
Anxiety/insomnia	1.66 ± 0.60	1.78 ± 0.72	NS
Social dysfunction	2.20 ± 0.43	2.35 ± 0.51	NS
Severe depression	1.35 ± 0.55	1.62 ± 0.86	**0.05***
Total score	1.74 ± 0.41	1.91 ± 0.58	NS
Health Locus of Control factors			
Internal locus	26.46 ± 7.32	24.78 ± 7.67	NS
Chance	22.38 ± 8.30	26.23 ± 8.56	**0.00***
Doctors	16.40 ± 2.27	16.41 ± 2.35	NS
Important others	12.27 ± 4.37	12.38 ± 4.80	NS
CES-D			
Depression	11.94 ± 10.73	14.32 ± 12.56	NS
STAI 1			
State Anxiety	28.77 ± 7.11	32.39 ± 12.22	NS
STAI 2			
Trait Anxiety	33.30 ± 7.85	38.21 ± 10.14	**0.01***

*p<0.05; N=144.

**NS= No Significant

Table 3. Mean scores ± SD of WHOQOL-BREF domains, GHQ-28 Health subscales, Health Locus of Control factors and Depression. Independent-Samples T Test demonstrating differences between the two categories of age.

WHOQOL-BREF domains	(N=24) Age (<45 years) M ± SD	(N=120) Age (>45 years) M ± SD	p-value
Physical	14.83 ± 2.30	12.79 ± 3.53	**0.00***
Psychological	15.16 ± 3.10	12.94 ± 3.39	**0.00***
Social relationships	14.55 ± 3.36	13.14 ± 3.07	**0.04***
Environment	12.84 ± 3.17	13.78 ± 2.30	NS**
Overall QoL/health	3.30 ± 1.08	3.01 ± 0.95	NS
GHQ-28 subscales			
Somatic symptoms	1.76 ± 0.55	1.79 ± 0.55	NS
Anxiety/insomnia	1.81 ± 0.63	1.69 ± 0.65	NS
Social dysfunction	2.04 ± 0.45	2.30 ± 0.46	**0.01***
Severe depression	1.35 ± 0.36	1.48 ± 0.75	NS
Total score	1.74 ± 0.37	1.82 ± 0.51	NS
Health Locus of Control factors			
Internal locus	28.91 ± 5.94	25.14 ± 7.62	**0.02***
Chance	23.08 ± 7.42	24.07 ± 8.83	NS
Doctors	15.25 ± 3.27	16.65 ± 1.97	**0.05***
Important others	11.75 ± 3.87	12.43 ± 4.66	NS
CES-D			
Depression	6.62 ± 3.24	13.58 ± 11.89	**0.00***

*p<0.05; N=144.

**NS= No Significant

Table 4. Mean scores ± SD of WHOQOL-BREF domains, GHQ-28 Health subscales and Health Locus of Control factors. Independent-Samples T Test demonstrating differences between the two categories of education.

WHOQOL-BREF domains	(N=87) Years of education (< 9) M ± SD	(N=57) Years of education (> 9) M ± SD	p-value
Physical	12.83 ± 3.46	13.57 ± 3.39	NS**
Psychological	12.97 ± 3.53	13.81 ± 3.25	NS
Social relationships	13.03 ± 3.43	13.88 ± 2.60	NS
Environment	13.00 ± 2.47	14.59 ± 2.17	**0.00***
Overall QoL/health	3.01 ± 1.01	3.14 ± 0.91	NS
GHQ-28 subscales			
Somatic symptoms	1.81 ± 0.55	1.74 ± 0.54	NS
Anxiety/insomnia	1.82 ± 0.69	1.54 ± 0.54	**0.01***
Social dysfunction	2.30 ± 0.49	2.20 ± 0.43	NS
Severe depression	1.57 ± 0.79	1.29 ± 0.50	**0.01***
Total score	1.88 ± 0.53	1.70 ± 0.41	**0.03***
Health Locus of Control factors			
Internal locus	26.38 ± 7.76	24.91 ± 7.00	NS
Chance	26.29 ± 8.05	20.25 ± 8.14	**0.00***
Doctors	16.28 ± 2.45	16.60 ± 2.04	NS
Important others	12.23 ± 4.65	12.43 ± 4.38	NS

*p<0.05; N=144.

**NS= No Significant

Table 5. Mean scores ± SD of WHOQOL-BREF domains and GHQ-28 Health subscales. One-Way ANOVA showing differences among singles, married and divorced/widowed.

WHOQOL-BREF domains	(N=25) Single M ± SD	(N=108) Married M ± SD	(N=11) Divorced/Widowed M ± SD	p-value
Physical	13.98 ± 2.51	13.18 ± 3.46	10.65 ± 4.16	0.02*
Psychological	13.57 ± 3.55	13.48 ± 3.31	11.03 ± 3.83	NS**
Social relationships	12.48 ± 3.56	13.85 ± 2.82	10.78 ± 3.69	0.00*
Environment	13.04 ± 2.47	13.94 ± 2.45	12.04 ± 2.09	0.02*
Overall QoL/health	3.10 ± 1.00	3.12 ± 0.94	2.36 ± 1.12	0.04*
GHQ-28 subscales				
Somatic symptoms	1.91 ± 0.54	1.74 ± 0.54	1.94 ± 0.57	NS
Anxiety/insomnia	1.74 ± 0.60	1.70 ± 0.65	1.76 ± 0.78	NS
Social dysfunction	2.29 ± 0.38	2.24 ± 0.48	2.44 ± 0.52	NS
Severe depression	1.32 ± 0.32	1.41 ± 0.66	2.19 ± 1.14	0.00*
Total score	1.82 ± 0.38	1.77 ± 0.49	2.08 ± 0.64	NS

*p<0.05; N=144. **NS= No Significant

Discussion

Investigating the relationship of sociodemographic variables with QoL, significant gender differences were found, with female patients reporting a more compromised QoL, and a poorer self-evaluated *psychological health.* Further, they reported a more negative perception on different aspects of their *environment*. In this respect, they seem to experience more a lack of available and high quality health services and they express a stronger dissatisfaction with their finances and opportunities for recreation and acquiring new skills.

Further, female patients tended to evaluate less favourably their general condition of health and mental health as measured by GHQ-28. The tendency was to report being more *depressed* endorsing more suicidal thoughts than men. This finding is in agrreement with several studies on chronic diseases, presenting female patients feeling more depressed than males (Vazquez et al., 2004; Gottlieb et al., 2004; Oikonomidou et al., 2005; Di Marco et al., 2006). However, when gender differences were investigated in another measure of depression using the CES-D scale, they were not significant. Both genders in this scale presented a higher level than that found in normal populations and should be considered as depressed according to Fountoulakis et al. (2001). A possible explanation regarding the differential results in the GHQ-28 and the CES-D scales is that although the two measures may be comparable regarding parts of their content,

actually they measure different aspects of depression. Namely, the GHQ-28 *severe depression* subscale includes items on suicidal thoughts, which are not included in the CES-D scale. Thus, although men and women in our sample reported being depressed, they seemed to differ regarding the degree of endorsed suicidal ideas, and so we may suggest that women indicated more symptoms of 'suicidal depression'.

Further, female patients reported being more *anxious* in comparison to males. This finding is also in agreement with several studies indicating that women present a higher prevalence of trait anxiety (Vazquez et al., 2004; Di Marco et al., 2006). As in the above case of measures of depression, differential values were observed between the STAI 2 and the GHQ-28 *anxiety/insomnia* sub-scale. In this case, gender differences were found in the STAI 2 scale, as women reported higher levels of trait anxiety -a rather longstanding condition- while differences were not found in the GHQ-28 respective sub-scale. It is noteworthy that although these scales may present some content overlap, they do not measure the same dimensions of anxiety (e.g. the GHQ-28 *anxiety/insomnia* subscale includes items on sleep problems which are not included in the STAI 2 scale). It is suggested that both depression and anxiety measures need to be multiple as they are useful addressing different dimensions of the clinical entity.

Regarding the measurement of beliefs or attributions about health, women seem to have a stronger preference for the dimension of *chance*, expressing thus the belief that it is rather the *external* factors, which are beyond one's prediction and control, that can determine the patient's condition of health. The dimension of external health locus of control was also observed in the less educated patients of our sample. It is noted that female patients, as seen in table 1, had less years of education, that is a higher percentage of elementary education and lower percentages of secondary and university level. Gender and education may be intertwined in QoL and mental health differences, and so it is suggested that the two variables may be considered within a confounding context that would require further investigation.

Regarding age, although the differences found were generally expected, they were also illuminating as younger patients reported better QoL in the *physical, psychological and social well-being*. Also, younger patients' attributions of health presented a consistency with their QoL evaluations. In this respect, they indicated a stronger preference for the *internal* dimension of health locus of control, referring to health as being determined by one's own behaviour and a matter of personal control. On the other hand, older patients reported falling behind in social activities and interests, and being more socially restricted and depressed. These findings are in agreement with several studies indicating that older patients present lower levels of physical well-being and higher levels of depression (Apostolou & Gokal, 2000; Kutner & Jassal, 2002; Dimkovic & Oreopoulos, 2002; Iacovides et al., 2002; Moshopoulou & Savidaki, 2003; Chiang et al., 2004; Tyrrell et al., 2005; Oikonomidou et al., 2005; Vasilieva, 2006). Further, older patients in their attributions about health, tended to rely more heavily on their *doctors*, as an important external determinant factor of health. Several studies are in agreement with the above findings, showing that younger patients report a stronger internal health-attributional style, while older patients rely more heavily on external factors, such as *chance*, or they rely more on their *significant others* (Buckelew et al., 1990). What is important in the findings of the present study is that the role of doctors can be more clearly considered in relation to the renal patients' personal characteristics and needs.

Regarding differences in relation to education, patients with more than nine years of education indicated a more favourable perception regarding different aspects of their *environment*. This may be interpreted that more educated patients seem better equipped to create for themselves a more satisfactory environment, with better health services, finances, recreation and other related aspects. Although differences were not reported in other domains of QoL, patients with less than nine years of education seemed to evaluate their mental health in a more negative way and reported suffering from higher levels of *anxiety/insomnia* and *severe depression*. As for health attributions, less educated patients appeared to rely more heavily on *chance*, that is endorsing the belief that unpredictable factors may play a central role for health. In

overall, patients with lower socioeconomic profiles or lacking in education (which is generally taken as an indicator of social status), are reported in the literature facing problems in their psychological well-being, social relationships and general health (Rebollo et al., 1998; Ellinikou & Zissi, 2002; Sesso, Rontrigues-Netto & Ferraz, 2003; Vazquez et al., 2003).

In respect to marital status, divorced/widowed patients, compared to singles and married, indicated a more compromised QoL, reporting poorer *physical health* and *social relations*, more negative perception of their *environment*, as well as poorer *overall QoL/health*. Compromised QoL was also associated with a more negative evaluation of *home life* and *satisfaction with work*. Further, they evaluated less favourably their mental health and reported a higher level of *depression* with suicidal thoughts. On the basis of these findings, married patients seem to experience a better QoL. Similar evidence in the literature indicates that the status of marriage in these patients may be significantly correlated with an enhanced physical well-being (Chiang et al., 2004).

These results provide useful indications that certain variables referring to the patient's sociodemographic profile may affect favourably or unfavourably his/her QoL. In the present study, being male, younger, more educated and married appeared to have a favourable effect on several aspects of the patients' QoL. The findings support evidence in the literature indicating that sociodemographic factors may to some extent contribute to the explanation of overall QoL (Arnold et al., 2004). According to Sprangers, De Regt & Andries (2000), independent of the kind of illness, being female, older, less educated and living without a partner are connected with a lower QoL.

In overall, our findings provide evidence which can be useful to health professionals and managers of health services offered to end-stage renal disease patients. Tailored interventions can be developed to support female but also male patients, those who are older, less educated, living alone, depressed, anxious, or those who endorse negative health beliefs of control, in an effort to address issues of compromised QoL.

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