O R I G I N A L   P A P E R

Health beliefs and quality of life in end - stage renal disease

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Abstract

Background: Patients' beliefs regarding their health are important to understand responses to chronic disease.
Objective: The present study aimed (i) to determine whether beliefs about health differ between different renal replacement therapies in End-Stage Renal Disease (ESRD) patients and (ii) to examine whether these beliefs are associated with health related quality of life (HQoL) as well as mental health.
Methodology: A sample of 89 ESRD patients, 41 in haemodialysis (HD) treatment and 48 in peritoneal dialysis (PD) treatment, completed the *World Health Organization Quality of Life* instrument, the *General Health Questionnaire,* the *State-Trait Anxiety* Inventory, the *Center for Epidemiologic Studies Depression* Scale and the *Multidimensional Health Locus of Control.*
Results: Regarding differences in health beliefs between the two groups, HD patients focused more on the dimension of *internal* health locus of control. This dimension was associated with better QoL (p= <0.01) and general health (p= 0.03) in the total sample. On the contrary, the dimension of *important others* in health locus of control was associated with higher depression (p=0.02).
Conclusions: The beliefs that patients hold about their illness appear to be related to the type of renal replacement therapy being undertaken. These cognitions have associations with HQoL and mental health in dialysis.

Key Words: Anxiety, depression, health beliefs, mental health, quality of life, renal disease

Introduction

End-stage renal disease (ESRD) patients have a high burden of disease (particularly cardiovascular comorbidities) affecting their quality of life (QoL) and dramatically shortening life expectancy (Covic, Gusbeth - Tatomir & Goldsmith, 2003; Covic, Seica, Mardare et al., 2006; Theofilou, Ginieri-Coccossis & Synodinou, 2010). Therefore, exploring QoL becomes an essential task in the management of this population.

These patients may be faced with serious stressors related to the illness and its treatment, arising from the chronic nature of ESRD and the intrusiveness of the medical treatment (Timmers, Thong, Dekker et al., 2008; Ginieri - Coccossis, Theofilou, Synodinou et al., 2008; Karamanidou, Theofilou, Ginieri - Coccossis et al., 2009; Theofilou, 2010a; Theofilou, 2010b; Theofilou & Panagiotaki, 2010; Theofilou, 2010c). They are often confronted with limitations in food and fluid intake; with physical symptoms such as itching and lack of energy; with psychological stressors such as loss of self-concept and self-esteem, feelings of uncertainty about the future, and feelings of guilt towards family members; and with problems in the social domain (Cameron, 1996; Christensen & Ehlers, 2002; Krespi, Bone, Ahmad et al., 2004; Covic, Seica, Gusbeth-Tatomir et al., 2004).

Recent studies in chronic diseases suggest that QoL and mental health may be related to patient's cognitive representations of illness

and treatment. When confronted with an illness, people create their own models and representations of the illness in order to make sense of and respond to the problems they are faced with (Heijmans & De Ridder, 1998; Caress, Luker & Owens, 2001; Cameron & Leventhal, 2003; Hagger & Orbell, 2003; Cameron & Moss-Morris, 2004; Rees, Fry, Cull et al., 2004).

Regarding health beliefs, recently it has been recognized that haemodialysis (HD) patients' beliefs that one's health is controllable was associated with less depression (Christensen, Turner, Smith et al., 1991). Further, after controlling for baseline level of depression, baseline internal health locus of control was not a significant predictor of depression in ESRD patients at follow-up (Cvengros, Christensen & Lawton, 2005).

In other studies, personal control was significantly and positively related to physical and social functioning, bodily pain, general health perception and the physical component score in HD and peritoneal dialysis (PD) patients (Timmers, Thong, Dekker et al., 2008). A higher personal control was also associated with a lower emotional response and a better understanding of the renal disease (Covic, Seica, Gusbeth-Tatomir et al., 2004).

Finally, it has been indicated that better health - related quality of life (HQoL) in dialysis patients is associated with higher control beliefs, lower illness and treatment disruptiveness, lower consequences and less symptoms (Griva, Jayasena, Davenport et al., 2009).

The purpose of this study is to examine health beliefs in ESRD patients and their relation to QoL and mental health.

Research questions and hypothesis

We mainly hypothesize that a stronger internal health locus of control is associated with better QoL and mental health indicating less symptoms of depression and anxiety.

Methodology

This study consists of two main parts. The first investigates the effect of duration of treatment on QoL and mental health of HD and PD patients. For this purpose, a cohort of 135 ESRD patients were recruited from dialysis units within three General Hospitals located within the broader area of Athens and consisted of: a) 77 patients (57.0%) undergoing in-centre haemodialysis (HD) and b) 58 patients (43.0%) undergoing continuous ambulatory peritoneal dialysis (CAPD/PD).

Table 1. Sociodemographic characteristics of the sample (N= 89).

	HD N=41 (46.06%)	PD N=48 (53.9%)
Age (years) Mean (SD)	65.34 (8.37)	64.10 (10.36)
Gender Male Female Total	21 (51.30%) 20 (48.70%) 41 (100.0%)	23 (47.90%) 25 (52.10%) 48 (100.0%)
Marital status Single Married D/W/R Total	4 (9.75%) 33 (80.48%) 4 (9.75%) 41 (100.0%)	6 (12.50%) 38 (79.20%) 4 (8.30%) 48 (100.0%)
Education 0-9 years > 9 years Total	29 (70.73%) 12 (29.27%) 41 (100.0%)	26 (54.16%) 22 (45.84%) 48 (100.0%)

Patients in these two treatment modalities had low comorbidity and were undergoing current dialysis for a varied period of time. In this respect, participants could be categorized into four distinct groups regarding current treatment: a) HD patients who recently commenced treatment (< 4 years), b) HD patients on long term treatment (> 4), c) PD patients who recently commenced treatment (< 4 years) and d) PD on long term treatment (> 4).

Next, in order to investigate differences between the HD and PD treatment modalities, without the possible effect of length of treatment, that is the second part of this study which will be presented below, 41 cases of HD and 48 cases of PD patients were selected from the total cohort of 135 participants

according to specified criteria to formulate two equivalent groups. Selection criteria included the patient commencing dialysis treatment within a 4 year period and ensured a balanced ratio of male/female participants within the two groups. Following the selection procedure, the two groups were tested for significant differences regarding sociodemographic variables. As seen in Table 1, the groups can be considered equivalent with no statistically significant differences between them (p. >0.05).

Table 2. MHLC in HD and PD patients.

MHLC factors	HD patients (N=41) M ± SD	PD patients (N=48) M ± SD	p-value**
Internal locus	27.36 ± 7.00	23.15 ± 8.35	**0.01***
Chance	25.21 ± 8.65	23.22 ± 9.16	0.30
Doctors			0.25
Important others	16.48 ± 2.27	16.80 ± 1.72	0.25
	13.21 ± 4.56	11.80 ± 4.77	

*p<0.05; N=89.

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. The measurement tools included:

The *World Health Organization Quality of Life* instrument (WHOQOL–BREF) (WHOQOL Group, 2004). It is a self-report generic QoL inventory of 26 items, validated within Greek populations (Ginieri-Coccossis, Triantafillou, Antonopoulou et al., 2003). The items fall into 4 domains: a) *Physical health,* b) *Psychological well-being,* c) *Social Relationships* and d) *Environment.* Two of the items provide a facet measuring *Overall QoL/health.* Higher scores indicate a better QoL.

The *General Health Questionnaire* (GHQ-28) is a widely used self-report measure of general health, developed by Goldberg in 1978 (Goldberg, 1978) and validated with Greek populations (Garyfallos, Karastergiou, Adamopoulou et al., 1991). It may identify short-term changes in mental health and is often used as a screening instrument for psychiatric cases in medical setting and general practice. The 28-item version used in this study, consists of four sub-scales: a) *somatic symptoms,* b) *anxiety/insomnia,* c) *social dysfunction and* d) *severe depression.* Higher scores indicate a worse general health status.

The *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; Liakos & Giannitsi, 1984). State anxiety reflects a "transitory emotional state or condition of the human organism that is characterized by subjective, consciously perceived feelings of tension and apprehension, and heightened autonomic nervous system activity"; it may fluctuate over time and can vary in intensity. In contrast, trait anxiety denotes "relatively stable individual differences in anxiety proneness" and refers to a general tendency to respond with anxiety to perceived threats in the environment (Spielberger, 1970). Higher scores mean that patients are more anxious.

The *Center for Epidemiologic Studies Depression Scale* (CES-D) (Radloff, 1977; Hann, Winter & Jacobsen, 1999; Fountoulakis, Iacovides, Kleanthous et al., 2001) is a 20-item self-report measure of depression. A higher score means that the patient is more depressed. In ESRD population, a value above 9.03 is required for a subject to be classified as depressed (Fountoulakis, Iacovides, Kleanthous et al., 2001).

The *Multidimensional Health Locus of Control* (MHLC) is a self-report tool measuring a patient's beliefs about control over health outcomes. Health locus of control is one of the widely used measures of individuals' health beliefs and has been designed to determine whether patients are internalists or externalists.

The inventory consists of 18 items, which comprise 4 categories of beliefs: a) *internal locus,* b) *chance,* c) *doctors* and d) *important others.* The last three refer to external locus of

control (Wallston & Wallston, 1976; Wallston, Wallston & DeVellis, 1978). The brief description of the theory explores the fact that health locus of control is a degree to which individuals believe that their health is controlled by internal or external factors. Whether a person is external or internal is based on a series of statements. The statements are scored and summed to find the above. Externals refer to belief that one's outcome is under the control of powerful others (i.e., doctors) or is determined by fate, luck or chance. Internals refers to the belief the one's outcome is directly the result of one's behaviour (Wallston & Wallston, 1976; Wallston, Wallston & DeVellis, 1978). The 4 categories are not mutually exclusive and scores may weight in a particular direction. Higher scores indicate stronger presence of the specific dimension of beliefs.

Statistical analysis

Kolmogorov-Smirnov tests were performed in order to check whether the values of the sample would fall within a normal distribution. Next, the analyses performed aimed to: a) investigate differences between HD and PD patients, using two groups comprised of selected cases from the total cohort of 135 patients, equivalent for length of treatment and sociodemographic characteristics. Independent Sample T-test was performed in order to check for significant differences in the variable of health locus of control examined in the study and b) investigate the relation between health beliefs and QoL as well as mental health in the total sample of ESRD patients. Thus, Pearson Correlation analysis was performed. Pearson Correlation analysis was also performed in order to investigate the above relation in the groups of HD and PD patients separately.
All analyses were performed with the Statistical Package for the Social Sciences (SPSS 13.0 for Windows).

Results

The values of the total cohort were found to pass the normality distribution test. With regards to illness beliefs, a significant difference was observed in HD patients presenting higher scores in the dimension of

internal health locus of control. Both groups presented a similar pattern of illness beliefs, according to which higher values were identified in the *internal* and *chance* dimensions followed by the dimensions of *doctors* and *important others* (Table 2). Investigating the relation between the dimensions of health locus of control and QoL as well as mental health in the total sample, *internal* health locus of control was associated positively with QoL and more specifically with the domain of *psychological health* (r= 0.35, p= <0.01) and the *overall QoL/health* facet (r= 0.48, p= <0.01). *Internal* health beliefs were also related negatively to general health, measured by GHQ-28 questionnaire, and more specifically to the sub-scale of *somatic symptoms* (r= -0.22, p= 0.03). On the other hand, the dimension of *important others* appeared to have positive connection with *depression*, measured by CES-D scale (r= 0.28, p= 0.02) (Table 3).
Further investigation was performed in the two groups of patients separately. In HD patients, *internal* health locus of control was associated positively with QoL, especially with the domains of *physical* (r= 0.37, p= 0.01) and *psychological health* (r= 0.48, p= <0.01), as well as the *overall QoL/health* facet (r= 0.59, p= <0.01). Also, *internal* health beliefs were related negatively to general health and more specifically to the sub-scales of *somatic symptoms* (r= -0.34, p= 0.02), *social dysfunction* (r= -0.31, p= 0.04) and *severe depression* (r= -0.33, p= 0.03) as well as the *total score* of GHQ-28 (r= -0.37, p= 0.01) in HD patients. Furthermore, it was indicated that *internal* health locus of control had negative connection with *state anxiety* (r= -0.49, p= 0.04) (Table 4).
With regards to PD patients, the results showed the positive relation between the *overall QoL/health* facet and the *internal* health locus of control (r= 0.45, p= <0.01).
However, the dimension of *important others* appeared to have negative connection with the domain of *psychological health*, measured by WHOQOL-BREF (r= -0.31, p= 0.03). This dimension was also related positively to the GHQ-28 sub-scale of *anxiety/insomnia* (r=0.32, p= 0.02), the *total score* of GHQ-28(r= 0.31, p= 0.03) as well as to *depression*, measured by CES-D scale (r= 0.41, p= <0.01) (Table 5).

Table 3. Correlations between MHLC and QoL, general health, depression as well as state/trait anxiety in the total sample.

MHLC	WHOQOL -BREF					GHQ-28					CES-D	STAI-1	STAI-2
	Physical Health	Psychological Health	Social Relations	Environment	Overall QoL/health	Somatic Symptoms	Anxiety /insomnia	Social dysfunction	Severe depression	Total score	Depression	State Anxiety	Trait Anxiety
Internal locus	0.19	0.35□ □	0.12	0.03	0.48□ □	-0.22□	-0.10	-0.12	-0.17	-0.18	-0.14	-0.23	-0.13
Chance	-0.03	-0.12	-0.20	-0.12	-0.06	-0.00	0.00	0.03	0.12	0.05	-0.15	-0.10	0.07
Doctors	-0.02	-0.08	-0.12	-0.11	0.05	-0.03	-0.07	-0.11	-0.07	-0.08	0.00	0.05	-0.10
Important others	-0.19	-0.15	0.03	-0.01	-0.02	0.13	0.12	0.17	0.13	0.16	0.28□	0.01	0.11

*p<0.05; **p<0.01; N=89.

Table 4. Correlations between MHLC and QoL, general health, depression as well as state/trait anxiety in HD patients.

= MHLC	WHOQOL -BREF					GHQ-28					CES-D	STAI-1	STAI-2
	Physical Health	Psychological Health	Social Relations	Environment	Overall QoL/health	Somatic Symptoms	Anxiety /insomnia	Social dysfunction	Severe depression	Total score	Depression	State Anxiety	Trait Anxiety
Internal locus	0.37□	0.48□ □	0.26	0.06	0.59□ □	-0.34□	-0.27	-0.31□	-0.33□	-0.37□	-0.21	-0.49□	-0.45
Chance	0.03	-0.16	-0.22	0.00	-0.16	0.00	-0.10	-0.03	0.10	0.00	-0.31	-0.25	-0.23
Doctors	-0.07	-0.19	-0.23	-0.13	-0.05	0.07	0.04	-0.08	0.05	0.03	0.23	0.10	0.13
Important others	-0.14	0.00	0.06	0.03	0.09	0.02	-0.14	0.06	-0.03	-0.03	0.00	-0.37	-0.34

*p<0.05; **p<0.01; N=41.

Table 5. Correlations between MHLC and QoL, general health, depression as well as state/trait anxiety in PD patients.

MHLC	WHOQOL -BREF					GHQ-28					CES-D	STAI-1	STAI-2
	Physical Health	Psychological Health	Social Relations	Environment	Overall QoL/health	Somatic Symptoms	Anxiety /insomnia	Social dysfunction	Severe depression	Total score	Depression	State Anxiety	Trait Anxiety
Internal locus	0.10	0.28	0.07	0.20	0.45□ □	-0.21	-0.09	-0.02	-0.16	-0.15	-0.16	-0.14	-0.05
Chance	-0.08	-0.06	-0.14	-0.27	0.06	-0.04	0.05	0.07	0.10	0.05	-0.10	-0.01	0.18
Doctors	0.00	0.07	0.05	-0.25	0.20	-0.16	-0.19	-0.14	-0.24	-0.21	-0.11	0.04	-0.19
Important others	-0.23	-0.31□	0.05	0.00	-0.13	0.22	0.32□	0.27	0.29	0.31□	0.41□ □	0.19	0.25

*p<0.05; **p<0.01; N=48.

Discussion

The present study examined the nature of illness cognitions in ESRD patients who had undergone different treatments and their associations with QoL and mental health.

Regarding health beliefs, HD patients indicated a greater preference to the *internal* dimension focusing more on their own personal control to regulate their health condition. This may reflect a stronger need of these patients to counterbalance the imposed dependence on the dialysis procedure and the restrictive dietary regimen by exercising control over their illness. Further investigation into this hypothesis is necessary. Concerning the relation between the dimensions of health locus of control and QoL in the total sample, it seems that *internal* health beliefs may help the patients to face their problems related to ESRD and evaluate in a positive way their QoL and the status of general health, showing better *psychological health* and less *somatic symptoms*. These results correspond to previous findings showing that *internal* health locus of control is associated with better QoL and understanding of patients' illness (Covic, Seica, Gusbeth-Tatomir et al., 2004). On the other hand, focusing on *important others'* control and responsibility over one's condition seems to indicate depressive mood. ESRD patients are reported in the relevant literature to present depressive symptomatology (Yucedal, Olmez, Gezen et al., 2003; Arnold, Ranchor, Sanderman et al., 2004; Oikonomidou, Zlatanos, Vayopoulos et al., 2005; Oo, Roberts & Colling, 2005). In further investigation that was performed in the two groups of patients separately, the above conclusions are confirmed. Specifically, in HD patients, *internal* health locus of control contributes to a positive perception of their QoL, indicating better *physical* and *psychological health* as well as *overall QoL/health*. Also, *internal* health beliefs help HD patients to evaluate more favorably not only their status of general health with less *somatic symptoms*, *social dysfunction* and *severe depression* but also their mental health showing less *state anxiety*. In the relevant literature, it has been suggested that personal control is significantly and positively related to physical and social functioning and general health

perception in these patients (Timmers, Thong, Dekker et al., 2008). As far as PD patients is concerned, *internal* health locus of control relates to a positive cognition regarding *overall QoL/health*. However, the dimension of *important others* leads to a negative evaluation of QoL and mental health indicating more depressive symptoms, anxiety and insomnia.

Limitations of the study may include the lack of investigating the effect of clinical factors, such as adequacy of dialysis, hemoglobin level, dialysis vintage, presence of diabetes mellitus or other clinical parameters, on the patients' perceptions of QoL and mental health. There is also a need for future research to use prospective and longitudinal study designs to examine the interaction of illness and treatment cognitions and outcomes and how these changes over time and the course of the illness.

Another methodological issue relates to the sample representativeness. Studies on the broader ESRD population and recruiting even larger samples to enable effective multi-group analysis should be pursued in future research.

Finally, regarding limitations of the study, it is important to refer that STAI 1/STAI 2, CES-D and MHLC questionnaires are not validated in Greek ESRD population, without in this way informing about the sensitivity and the internal consistency of these measurements. Future studies using the above instruments on patients with ESRD are needed in order to make generalized conclusions on mental health and health beliefs of this population. Despite its limitations, the present study demonstrates the importance of understanding the illness and treatment beliefs of patients with ESRD and the contribution of these beliefs to HQoL. This suggests potential for investigating whether individually based or group based interventions that are aimed at specific, inaccurate, individual illness perceptions can improve perceived QoL in dialysis patients.

Acknowledgments

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