Quality of life in hemodialysis patients and the relationship with mortality, hospitalizations and poor treatment adherence

Qualidade de vida de pacientes em hemodiálise e sua relação com mortalidade, hospitalizações e má adesão ao tratamento

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ABSTRACT

Introduction: Chronic kidney disease (CKD) causes sudden changes in the daily lives of patients, creates limitations to perform activities of daily life and creates a great impact on emotions and quality of life (QOL) of patients. **Objective:** To understand the relationship between QOL of patients on dialysis and mortality rates, hospitalization and absences. **Methods:** A prospective descriptive study with 286 patients on hemodialysis, by applying demographic questionnaire, KDQOL SF-36 and electronic medical record analysis Dialsist. **Results:** The mean age was 54.71 ± 14.12 years, with a mean score of QOL 60.53 having as higher factor encouraging the support team (85.03) and lowest in work status (21.11). The days of hospitalization is negatively correlated to the compounds of the instrument, particularly in physical functioning ($p = 0.000$), mean score ($p = 0.001$) and emotional well-being ($p = 0.005$). Women had lower QOL in physical role scores, symptoms/problems, physical functioning, emotional well-being, energy and fatigue mean score ($p \leq 0.05$). The lowest score was found to be related to treatment of patients in 1 year and 7 months and 5 years (59.93) and higher in patients with more than five years and one month (61.39). **Conclusion:** Hospitalizations decrease QV emotional and physical scores and absences are directly related to social support and age. The study looked through the data raise subsidies for the work of the aspects that need stimulation and adaptation in the lives of patients, providing a better balance in the individual's life.

Keywords: psychology, medical; quality of life; renal dialysis.

RESUMO

Introdução: A doença renal crônica (DRC) acarreta mudanças repentinas no cotidiano dos pacientes, cria limitações para realizar as atividades de vida diária e gera um grande impacto nas emoções e na qualidade de vida (QV) do paciente. **Objetivo:** Compreender a relação entre a QV do paciente em hemodiálise e as taxas de mortalidade, hospitalização e faltas. **Métodos:** Estudo descritivo e prospectivo com 286 pacientes em hemodiálise, mediante aplicação de questionário sociodemográfico, KDQOL SF - 36 e análise de prontuário eletrônico Dialsist. **Resultados:** Idade média de 54,71 ± 14,12 anos, com escore médio de QV de 60,53, tendo como fator mais elevado o encorajamento da equipe de apoio (85,03) e menor em status de trabalho (21,11). Os dias de hospitalização se correlacionaram negativamente aos compostos do instrumento, principalmente no funcionamento físico ($p = 0,000$), escore médio ($p = 0,001$) e bem-estar emocional ($p = 0,005$). As mulheres apresentaram menor QV em escores de papel físico, sintomas/problemas, funcionamento físico, bem-estar emocional, energia fadiga e escore médio ($p \leq 0,05$). O menor escore encontrado foi referente aos pacientes em tratamento entre 1 ano e 7 meses e 5 anos (59,93) e o maior em pacientes com mais de 5 anos e 1 mês (61,39). **Conclusão:** As hospitalizações diminuem a QV do quesito emocional e físico e as faltas estão diretamente relacionadas ao suporte social e à idade. O estudo buscou, por meio dos dados, levantar subsídios para o trabalho dos aspectos que necessitam de estimulação e adaptação na vida dos pacientes, proporcionando um maior equilíbrio na vida do indivíduo.

Palavras-chave: diálise renal; psicologia médica; qualidade de vida.

INTRODUCTION

Chronic kidney disease (CKD) is a progressive irreversible condition that leads to a series of biochemical, clinical and metabolic disorders, directly or indirectly linked to high rates of hospitalization, morbidity and mortality. In addition to the physiological and emotional shocks felt at the time of diagnosis and during the course of treatment, patients suffer from further losses in professional, social, sexual, and psychological contexts.

The clinical manifestations of CKD, together with the disease's psychosocial repercussions, increase stress levels and may impact patient quality of life (QOL). The complexity and extent of involvement of CKD has led to the development of a number of studies to analyze the impact of the disease on the QOL of patients in various areas.[1]

The term quality of life (QOL) encompasses a wide array of indicators in the physical, psychological, social, and environmental domains. QOL assessment is not limited to verifying whether an individual is disease-free; it also looks into an individual's physical, mental, and social wellness.[2,3] The *World Health Organization Quality of Life Group*[4] uses the following definition for QOL:

> Quality of life is defined as individuals' perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns[4] (p. 1405).

For reasons of coherence, this study adopted the definition of QOL used in the Kidney Disease Quality of Life Short Form 36 (KDQOL SF-36) questionnaire translated and adapted into Brazilian Portuguese.[5] In the context of CKD, QOL refers to the patients' perceptions of their mental and physical health and the way CKD interferes with their activities of daily living.

This study aimed to understand the relationship between the QOL of patients on hemodialysis and death, hospitalization, and poor compliance to treatment (indicated by the number of missed hemodialysis sessions). The KDQOL SF-36 dimensions were tested for these associations. The correlations between QOL ratings and age, gender, time of treatment, and presence or absence of diabetes were also analyzed.

The analysis of the relationships between QOL, hospitalization and death is warranted, since hospitalization increases the risk of morbidity and mortality[6,7] and may exacerbate emotional and social stress, thus affecting patient QOL. In contrast, the literature indicates that low QoL scores are predictors of death in patients undergoing dialysis.[7-9]

Significant attention has been devoted to the assessment of QOL as it relates to the treatment and prognosis of various conditions. CKD in particular entails significant changes in the lives and self-perceptions of QOL of patients. Despite the growing number of QOL studies, little data is available on patient populations in southern Brazil. One of the goals of this study was to narrow this information gap.

METHODS

This quantitative, descriptive prospective study enrolled 286 patients with CKD on hemodialysis treated in the Curitiba Metropolitan Area at the four clinics of the Pró-Renal Foundation. The size of the convenience sample assembled for the study was based on a margin of error of 5% and a confidence level of 95% for the total population.

Patients with CKD on hemodialysis seen at the Pró-Renal Foundation were included in the study. Patients from other cities undergoing dialysis temporarily at the Foundation's clinics, individuals in transit to other locations, subjects treated for less than 60 days, and patients with severe cognitive or language impairment were excluded.

The research project was submitted to the Ethics Committee of the Pontifical Catholic University of Paraná and was granted permit 008004/2015. The participants were informed of the purposes of the study and signed informed consent terms, which allowed them to voluntarily join the study.

Three tools were used to collect patent data: a mixed socio-demographic questionnaire covering personal data and questions about lifestyle habits; the KDQOL SF-36 QOL scale for patients with CKD; the Dialsist electronic patient chart system developed by the Pró-Renal Foundation covering death and hospitalization, and missed hemodialysis sessions.

Enrolled patients answered the study question-naires between June and September of 2015. The number of hospitalizations was captured from the patients' medical records to include entries made

between January and September of 2015, assuming that admissions occurring prior to data collection impacted the health statuses of the patients at the time. No inclusion or exclusion criteria were established between the date of hospitalization and the date at which the questionnaires were answered.

The data were grouped, sorted, and processed using software package SPSS (Statistical Package for Social Sciences) version 20.0. Statistical significance was attributed to events with a p-value lower than 5% ($p < 0.05$). The KDQOL SF-36 scores were calculated based on the recommendations and tables provided by the KDQOL Working Group.[10]

RESULTS

The sample comprised mostly Caucasian (56.7%) male (60.1%) individuals with a mean age of 54.71 ± 14.12 years, with incomplete elementary education (43.6%); 73.2% reported following a religion. Most patients (69.7%) lived with their spouses and/or children; 27.1% had four or more children; 69.5% made three minimum wages or less a month; and 88.7% were no longer working. The patients were hospitalized for a mean of 3.01 ± 7.43 days and missed 3.86 ± 5.59 hemodialysis sessions. Eight study participants died during the course of data collection.

Patients with scores closer to 100 in the KDQOL SF-36 have higher levels of quality of life. The patients enrolled in the study had a mean QOL score of 60.53 ± 14.10. Table 1 shows the mean scores and standard deviations (SD) in each category in descending order.

The scores obtained in the KDQOL SF-36 were analyzed against length of hospitalization, missed hemodialysis sessions, and death. Stronger correlations were found between QOL and length of hospitalization. Table 2 displays the correlations observed between length of hospitalization and QOL scores.

Inverse correlations were found between every item in the table mentioned above and QOL scores. Despite the relevance of these items for the study, the correlations were poor.

Statistically significant inverse correlations were seen between missed hemodialysis sessions and social functioning ($r = -0.223$; $p = 0.000$), cognitive functioning ($r = -0.116$, $p < 0.05$), and age ($r = -0.124$; $p < 0.05$).

TABLE 1	MEAN KDQOL SF-36 QOL SCORES	
	Mean	SD
Health care staff support	85.03	22.19
Cognitive function	80.97	21.81
Patient satisfaction	78.22	19.35
Quality of socialization	77.51	22.98
Social support	75.00	33.54
List of symptoms/problems	74.00	18.13
Sleep	70.31	21.11
Effects of renal disease	67.74	22.45
Emotional wellness	67.73	24.55
Social functioning	67.41	28.07
Overall Health	64.01	23.49
Mean score	60.53	14.10
Bodily pain	59.91	30.56
Vitality	54.78	24.78
General health	52.96	22.38
Physical functioning	52.13	29.75
Role-emotional (limitation)	46.86	42.41
Mental health	45.65	11.63
Burden of CKD	42.80	27.25
Physical functioning	38.83	9.81
Role-physical (limitation)	36.71	39.84
Sexual functioning	30.39	43.34
Occupational status	21.11	33.14

SD: standard deviation; CKD: chronic kidney disease.

TABLE 2	CORRELATION BETWEEN LENGTH OF HOSPITALIZATION AND SPECIFIC KDQOL SF-36 QOL SCORES	
Correlation with	r	p
Physical functioning	-0.205	0.000
Mean score	-0.198	0.001
Vitality	-0.177	< 0.005
Emotional wellness	0.164	0.005
Mental health	-0,161	0.01
Role-emotional limitation	-0.150	0.01
Burden of CKD	-0.149	< 0.05
Patient satisfaction	-0.147	< 0.05
General health	-0.147	< 0.05
Quality of socialization	-0.137	< 0.05
Health care staff support	-0.123	< 0.05
Occupational status	-0.122	< 0.05

Pearson's correlation coefficient. r: level of correlation; p: significance; CKD: chronic kidney disease.

The number of deaths (n = 8) did not allow for a statistically significant comparison between the patients enrolled in the study (n = 278), but the data indicated a difference of scores in these two subgroups. The patients who subsequently died had lower mean QOL, effect of CKD, burden of renal disease, physical functioning, bodily pain, and social functioning scores. However, they had higher cognitive and social functioning scores.

Three causes of death were directly related to complications of heart conditions (cardiogenic shock, cardiac arrest, coronary atherosclerosis). The other causes were connected to complications in the renal transplant procedure, septic shock, hypovolemic shock, stroke, and metastatic prostate cancer. Only one of the eight patients who died never missed a hemodialysis session during the nine months of data collection. The other individuals missed between one and 12 sessions within the same time span.

Table 3 shows the stronger and more significant correlations between QOL scores.

The strongest of the correlations presented in the table mentioned above was observed between the role-emotional and social functioning, followed by the correlation between role-emotional and general health; role-emotional and symptoms/problems; role-emotional and bodily pain; general health and quality of social interactions; staff encouragement and mental health.

Two positive and three negative correlations were observed between QOL scores and patient age. Positive correlations include effects of CKD (r = 0.189; p = 0.001) and social functioning (r = 0.156, p < 0.01). It is understood, therefore, that older patients had higher QOL scores for social functioning and effects of CKD. Negative or inverse correlations were seen for physical functioning (r = -0.180; p < 0.005), role-physical (r = -0.132, p < 0.05), and missed hemodialysis sessions, as previously shown.

When the mean scores were compared for gender, females were found to have lower scores in 19 of the 22 tested categories, and higher QOL scores than males only in relation to the effects of CKD (F: 66.73; M: 65.64), burden of renal disease (F: 38.99; M: 37.74), and patient satisfaction (F: 66.02; M: 62.56). Therefore, females had lower mean QOL scores than males (F: 54.01; M: 58.24).

The groups had statistically significant differences (p < 0.05) in their role-physical, symptoms/problems,

TABLE 3	CORRELATIONS BETWEEN SPECIFIC KDQOL SF-36 QOL SCORES		
Correlation between scores		r	p
Emotional wellness	Social functioning	0.534	< 0.001
Emotional wellness	General health	0.430	< 0.001
Emotional wellness	Symptoms/ problems	0.425	< 0.001
Emotional wellness	Bodily pain	0.386	< 0.001
General health	Quality of socialization	0.336	< 0.001
Health care staff support	Mental health	0.282	< 0.001

Pearson's correlation coefficient. r: level of correlation, p: significance.

physical functioning, role-emotional, vitality, and fatigue mean scores. Figure 1 shows a comparison of the significant mean score differences between groups.

Almost forty percent (39.44%) of the patients enrolled in the study had diabetes, and 56.14% of the diabetic individuals were males. The comparison of the QOL scores of diabetic and non-diabetic patients revealed a significant difference only in the physical functioning scale (Figure 2).

The mean physical functioning scores of diabetic and non-diabetic patients were 43.16 and 58.02, respectively (p = 0.000). The differences between the other scores were not statistically significant.

The patients were split into four groups in the assessment of QOL scores in relation to time on hemodialysis: two to six months of HD (n = 45); seven to 18 months of HD (n = 71); 19 to 60 months of HD (n = 110); and 60+ months of HD (n = 60). Figure 3 shows the mean QOL scores in relation to time on hemodialysis.

The patients on hemodialysis for 19 to 60 months attained the lowest QOL scores (59.93 ± 13.78), followed by individuals on HD for up to 6 months (60.34 ± 11.59) and subjects on HD for seven to eighteen months (61.19 ± 15.47).

The patients on HD for 60 + months had the highest mean QOL score (61.39 ± 14.82). However, the difference against the scores of the other groups was not statistically significant.

DISCUSSION

Quality of life is vitally important to patients with CKD as they attempt to resignify the condition

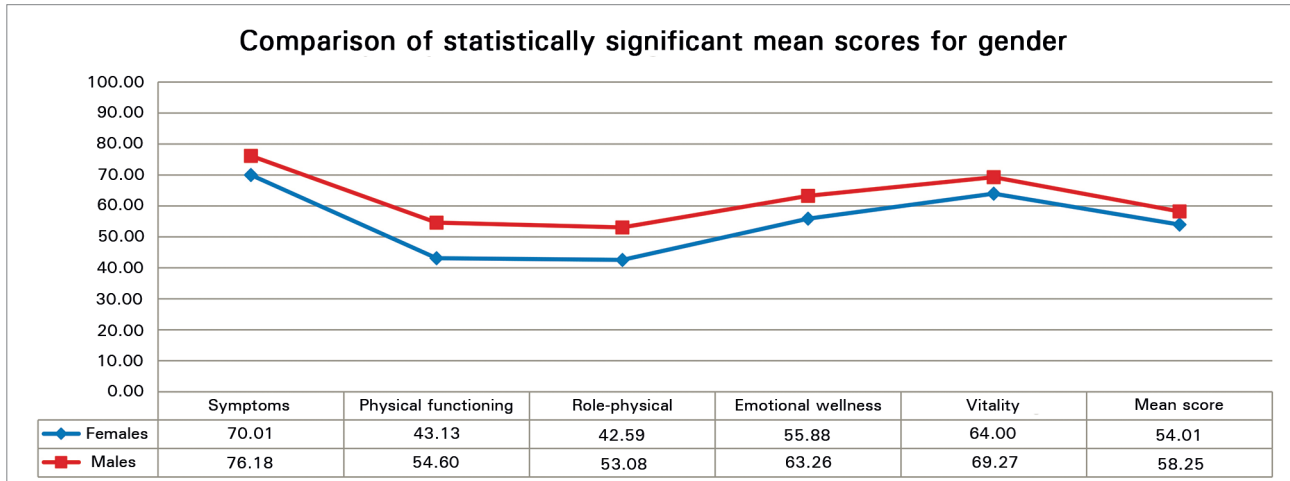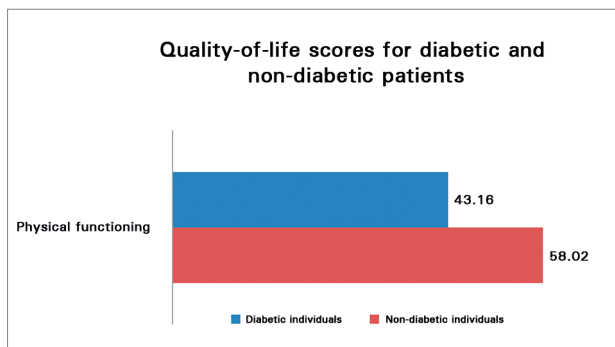**Figure 1.** Comparison of statistically significant mean quality-of-life scores.

Comparison of statistically significant mean scores for gender

	Symptoms	Physical functioning	Role-physical	Emotional wellness	Vitality	Mean score
Females	70.01	43.13	42.59	55.88	64.00	54.01
Males	76.18	54.60	53.08	63.26	69.27	58.25

Figure 2. Comparison of physical functioning quality-of-life scores of diabetic and non-diabetic patients.

Quality-of-life scores for diabetic and non-diabetic patients

Physical functioning
43.16
58.02

■ Diabetic individuals ■ Non-diabetic individuals

Figure 3. Comparison of mean quality-of-life scores for time on dialysis.

Mean QOL score in relation to time on HD

Mean score

■ 60+ months
■ 19 to 60 months
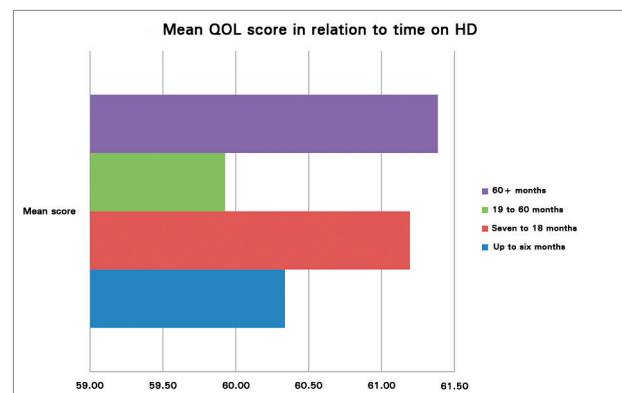■ Seven to 18 months
■ Up to six months

they face. The way of coping with the disease and its implications rely on the inter- and intra-psychic resources controlled by the patient. Aggressiveness, anxiety and depressive mood are often manifest in patients with CKD as they are required to rethink themselves and adapt to the disease, in addition to complying with the rigorous requirements of treatment.

But such a context calls for attention to aspects such as one's psychic structure, cognitive levels, personality structure, and sociocultural factors. The sociodemographic information captured in this study was in consonance with the data of other studied populations treated for chronic kidney disease. Our group is made up of mostly male individuals in their mid-50s, either retired or on leave from their jobs.[10-14] In 2014, Brazil was estimated to have 112,004 individuals on dialysis; 58% of them were males.[15]

The mean QOL score of the individuals enrolled in this study (60.53 ± 14.10) was lower than the mean score reported in studies performed in the United States (63.7) and Europe (62.7).[16] However, our mean score was higher than the mean scores seen in studies carried out in the East. Participants in a survey conducted in India had a mean QOL score of 53.73 ± 11.75.[17] In Saudi Arabia, the mean QOL score was 47.50 ± 13.80.[18]

The two higher QOL scores in this study were observed in staff encouragement and patient satisfaction with the care provided during dialysis, confirming the correlation between QOL and the relationship with the staff. Similar results were reported in international[10] and Brazilian studies.[19]

The QOL scores concerning occupational status reflect the interference the disease has produced on the patients' current job statuses. Patients retired or on leave from their jobs because of the disease had lower QOL scores in this area. In the field of occupational activity, the lowest mean scores were seen in job status (21.11 ± 33.13), which corroborated the literature.[6,10,13] Occupational activity is exceedingly important for patients with CKD, as described by Bohlke *et al*.[11] through significant correlations

between having a job and higher QOL scores in physical and mental domains.

Although the literature has identified low QoL scores as predictors of death in patients undergoing dialysis,[7-9] our study failed to find statistically significant correlations between these variables. This lack of statistical significance may be explained by the magnitude of the portion of the sampled population that died during the data collection campaign.

The relative number of patients who died in this study - eight of 278 enrolled individuals (2.87%) - was significantly lower than the annual death rate of patients with CKD (17.9%) in 2013,[19] and than the rates reported in other studies.[20]

Our data showed a trend toward statistical significance in the differences between some scores, such as the mean QOL, effect of CKD, burden of renal disease, physical functioning, bodily pain, and social functioning scores (all were lower in the patients who died during the study), as reported in other studies.[8,9] Death has been associated with the scores related to physical aspects[8,9] and pain.[9] Higher numbers of hospital admissions[6,7] and duration of hospitalization[9] have been listed as factors requiring closer attention for the association they have with risk of death.

A possible link between death and poor compliance to treatment was evinced by the causes of death and the considerable number of hemodialysis sessions the individuals in this patient group missed. However, the confirmation of such association requires the analysis of biochemical parameters and information on compliance to nutritional and drug therapies, either of which covered in this study.

Health-related QOL is a predictor of hospitalization and death in several diseases.[12] The analysis of the correlations found in this study showed that length of hospitalization impacted patient QOL, as longer hospitalization times were associated with lower QOL scores, specifically in terms of physical parameters as reported by Santos.[9]

Patients with CKD are expected to be affected in physical functioning, vitality, and general health.[13] However, our study indicated that emotional aspects such as emotional wellbeing, mental health, burden of renal disease, role-emotional, and social functioning were also affected by hospitalization.

Other authors pointed out that hospitalization significantly alters the lives of patients, and that the degree of involvement, length of hospitalization, and the loss of autonomy bear direct impact on this process.[21-24]

Compliance to treatment, assessed in this study through the number of hemodialysis sessions missed by the patients, had an inverse correlation with social support. The literature on this subject stresses the importance of social support in compliance to treatment and in the patients' physical and emotional wellness.[7,13,25-27] Support provided by the health care team correlated significantly with mental domain scores in this study and has been described in the literature as an essential resource to help patients to cope with the disease and the treatment.[20,26]

The patients' families often provide support, as the disease also affects them directly. Although family support is essential and positive, overly controlling relatives may be as much a burden as absent ones.[7] Therefore, families should be included in the treatment and encouraged to join in and offer guidance. Well-informed families have a greater chance of participating in the treatment in concert with the health care staff.[27]

QOL scores related to cognitive functioning correlated inversely with the number of missed HD sessions; lower cognitive function scores correlated with greater number of missed HD sessions and, thus, poorer compliance to treatment. The cognitive functioning component of the questionnaire assesses the degree to which respondents have trouble focusing, experience mental confusion, and impaired responses to events and interactions with other people.

Patients with CKD frequently present decreased cognitive functioning.[28] According to the literature, cognitive impairment may occur at any stage of CKD and has been associated with increased risk of death and poorer compliance to treatment. Although the mechanisms leading to loss of cognitive function in CKD have not been entirely elucidated, clinical conditions such as uremic toxin levels have been linked to nerve injury.[28]

With this data in mind, it is possible to hypothesize that a greater number of missed HD sessions might impact clinical conditions and lead to more marked cognitive impairment. In contrast, loss of cognitive function may contribute to greater numbers of missed HD sessions due to lower levels of comprehension of how treatment works and of the risks associated with noncompliance.

Age also correlated significantly with increased HD session absenteeism, with older patients missing fewer HD sessions and complying better with treatment. In our study, age correlated significantly with social support, a variable also associated with less absenteeism.

Aging and disease progression might lead patients to experience physical difficulties and suffer with decreased autonomy and independence from their families and caregivers. In view of these facts, deteriorated clinical status and increased dependence on others might be associated with fewer missed HD sessions and, thus, improved compliance to treatment.[29]

The results of the study also showed positive correlations between emotional wellness and social functioning, general health, symptoms/problems, and bodily pain. One might think that these factors are mutually related and cannot thus be separated as either the cause or the consequence of a given score. Physical factors affect psychological factors as much as psychological factors affect physical factors.[20,29]

In addition to the factors mentioned above, physical complications carry with them concerns around the loss of autonomy and increased dependence on others to carry out activities of daily living. This factor may also affect the emotional wellness and the QOL of patients with renal disease.[27]

Health, physical, and emotional factors may also interfere with the patients' ability to socialize. Social functioning scores reflect such interference. Patients scoring higher on emotional wellness complained less of adverse impacts on social functioning. These factors are intertwined as socialization plays a key role in the emotional health of an individual and one's emotional health impacts one's ability to socialize.

The results of this study showed that health status might impact the quality of socialization and vice-versa. Previous studies have described a relationship between social support and emotional wellness.[17] Health care teams must pay close attention to social functioning as it is closely related to improved patient QOL.[20]

The connections between physical and emotional wellness call for the consideration of factors beyond the patients' biology. The social, cultural, and psychological contexts to which they belong are integral parts of the care they are provided. Interdisciplinary care is an indispensable requirement.

As reported by other authors, this study found that aging was associated with increased levels of physical impairment.[8,11,13,19,20,30,31] This is a fact to some extent expected, since aging has been associated with deteriorating health, onset of additional symptoms, and increased difficulty performing activities of daily living.[13]

Nonetheless, the scores related to social support and effects of CKD correlated positively with age, i.e., older patients had higher scores and younger individuals had lower scores, as also reported in the literature.[7]

Patients feel the effects of renal disease in the form of food and fluid restrictions they have to comply with, their limited ability to work and travel, the dependence they have on health care staff, the stress and preoccupation inherent to CKD, sex life, and appearance. Some studies have shown that elderly patients are able to more easily accept the conditions imposed by the disease.[29,32]

Considering that QOL is a function of the gap between expectations and perceptions of reality, one might hypothesize that the expectations of older patients are closer to reality in regards to the effects of the disease, which makes them more prone to accepting the changes caused by their condition.[29]

The greater levels of social support reported by elderly patients might be linked to the loss of physical function, the consequent need for additional aid and increased dependence on others, and, when families are involved in their care, to a more acute perception of being offered help.

The data showed that females on HD had lower QOL than males on HD, as reported by other authors.[10,14,33] In the roster of statistically significant score differences, role-physical was the lowest score observed among the female participants of the study. We might hypothesize that since women usually play the role of the caregiver, they are rarely offered social support or taken care of when they need it. Moreover, many women do not cease to engage in their traditional occupations of taking care of their homes and children, which exposes them to even higher levels of stress.[33]

The comparison of diabetic and non-diabetic individuals revealed that physical functioning was the area of QOL in which the scores of diabetic patients were lower and more significantly different than the scores of non-diabetic subjects. One might

reason that this difference occurs as a consequence of disease progression and poor compliance to treatment such as vision problems, limitations and adherence to treatment, such as eye and locomotor disorders, stroke, limb amputation, heart disease, and neuropathy.[34]

Authors of prospective studies analyzed the data correlating time of treatment and QOL to find that QOL scores increased with time.[35] Although no statistically significant differences were found, our study agreed with the literature in that it showed that patients on HD for over 60 months had higher QOL scores than individuals treated for shorter periods of time.

Although such increase in scores did not occur progressively, it is important to stress that perceptions of QOL are unique to each individual and are not necessarily consistent among similar subjects, once they are built based on the psychological and physical support resources available to each patient.

CONCLUSION

This study looked into the impact of CKD on QOL to identify the more relevant issues affecting a population of patients on HD. The results reported herein confirmed some of the perceptions recorded during consultations with patients. The mean QOL score of the studied population was (60.53 ± 14.10).

Convenience samples are often characterized by wide variability, as shown in the elevated standard deviations reported in this study. However, attaining insight into the QOL of individuals on HD helps one reflect on the meaning of treatment and picture the lives of patients submitted to high-complexity care.

Having an occupation is a defining factor in the construction of a person's identity and self-image. Many of the patients enrolled in our study could not keep their jobs and were likewise unable to replace these jobs with significant constructive activities. They end up seeing themselves as dysfunctional and useless.

People with chronic kidney disease have considerable trouble keeping or going back to their jobs on account of various physical, psychological, and legal obstacles. This fact contributes to the installation of a vicious cycle of depression, anxiety, stress, and the perception of being a burden to their families.

Burden of renal disease was another area in which lower QOL scores were observed - a factor linked to levels of autonomy or dependence on others. When the patient falls ill, the family falls ill with them. So how can renal patients be productive in spite of their impairments and limitations? What are the possible interventions an integrated health care team can offer to help patients attain healthy levels of autonomy and adaptation? These important questions call for additional thought.

The mean total QOL score was pushed up by health staff encouragement, social support, and social functioning - all of which elements of integrated care designed to meet the needs of patients with complex conditions. The positive impact of these items increased the scores attained in correlated domains such as mental health, eliciting new possible areas for intervention.

Females had lower QOL scores than males in practically all areas, particularly in the domains related to physical symptoms and emotional wellness. According to the literature, women are more prone to suffering from depression and anxiety, a finding that requires closer observation.

Another aspect to be considered is the role women occupy within their cultures and families as caregivers. When families fall ill, not everyone steps up to assume support and caregiving roles.

Correlation analysis revealed that hospitalization considerably decreased vitality and emotional wellness scores. However, our analyses did not verify whether the patients had been hospitalized before or after answering the questionnaire. The likely differences in QOL scores between patients hospitalized at some point *versus* clinically stable individuals might have added to the discussion of our study's findings.

Missed HD sessions, an indicator or poor compliance to treatment, were directly associated with social support and age. The analysis of this correlation suggested that encouraging families to support their diseased relatives and making them co-responsible for treatment is the best way to fight patient absenteeism. At the same time, families should support patient autonomy so as to prevent them from regressing psychologically. Psychology plays an important role in the attainment of higher QOL scores as it encourages patients to adapt and cope with their issues, while balancing their lives in social and treatment settings.

Our study probed into the QOL components affecting individuals with chronic kidney disease on hemodialysis and added to the literature produced on this topic. The data collected provided valuable information to health care workers and contributed to a better understanding of the factors associated with quality-of-life increases and decreases in in the lives of individuals on renal replacement therapy.

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