

Health-Related Quality of Life in Elderly Chronic Kidney Disease Patients Undergoing Hemodialysis

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Abstract

Objective: Evaluating the quality of life of elderly chronic kidney disease patients undergoing hemodialysis treatment.

Methods: It was a descriptive and transversal study performed with 58 patients in a hemodialysis center. The World Health Organization Quality of Life-bref (Whoqol-bref) questionnaire was used to measure the quality of life of the participants of the study. Data were analyzed descriptively, using SPSS version 21.

Results: The majority of the participants were male (62%); aged between 60 and 75 years (84%); married (58%); retired or receiving illness aid (80%); Catholic (86%). Most patients had at least four years of formal education (80%); received between one and two Brazilian minimum wage (77%); classified their health as "fragile" or "very fragile" (58%); had been on hemodialysis for more than a year (80%), and its prevalence was 60% between one and six years. The arteriovenous fistula was present in 88% of the patients. High blood pressure was the main primary cause of the chronic kidney disease in 48.64% of the patients. Regarding the quality of life of the elderly patients measured by the Whoqol-bref questionnaire, the Physical was the most affected domain with an average of 43.94. It was found a significant statistical difference between quality of life of the elderly chronic kidney disease patients and years of formal education in the following domains: Social Relationships ($p=0.001$), Environment ($p=0.029$) and General Quality of Life ($p=0.013$). A significant statistical difference was also reported between quality of life of elderly chronic kidney disease patients and family income in

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the Environment ($p=0.006$) and General Quality of Life domains ($p=0.031$).

Conclusions: Studies on quality of life offer strategies to health workers that allow them to measure physical, psychological, social and environmental necessities in a way to meet the real needs of elderly patients undergoing renal therapy.

Keywords

Renal Insufficiency; Aging;
Hemodialysis; Quality of Life.

Introduction

The life expectancy of the Brazilian population increased by 25.4 years between 1960 and 2010, changing from an average of 48 to 73.4 years. According to demographic data, it is also happening in other nations because the population ageing is a global phenomenon. Regarding the number of elderly people in each country of the world, it is believed that Brazil will occupy the sixth place by 2025 [1].

Aging has been associated with greater vulnerability related to the onset of chronic diseases, such as high blood pressure (HBP), diabetes mellitus (DM) and, consequently, chronic kidney disease (CKD), which is a progressively debilitating and disabling chronic medical condition. In fact, CKD has a high prevalence, incidence and mortality rate in the world population [2]. In regard to the number of CKD patients in Brazil, it was reported an exponential increase in the last five years: from 49,077 in 2010 to 112,004 in 2014 [3].

Patients with CKD may experience a negative impact on their quality of life, which comes from the anxiety that can appear before and during treatment. Moreover, the lack of autonomy, the difficulty in dealing with an irreversible and incurable disease, the problem in moving three times a week to reach hemodialysis centers, the decrease of health levels, the limitation to perform daily activities, and the lack of comprehension of family

members and friends may be the main causes of the impairment of physical and mental health of many CKD patients [4]. Therefore, the existence of symptoms related to daily activities of patients undergoing hemodialysis is a notable cause for negative impacts on their lives.

Hemodialysis in the elderly CKD patients has unique clinical features that should be considered by health workers and researchers. Compared to the younger population, these patients have more comorbidities, require more hospitalizations and use more drugs and health services [5].

The quality of life of CKD patients is a unique, personal, nontransferable and complex concept that is linked to the human-adaptive mechanisms. It requires numerous factors related to physical, psychological, environmental, social and personal relationships dimensions.

Therefore, improving the quality of life and survival rate of patients, as well as preventing and reducing the complications of renal replacement therapy, has been related as constant concerns of health professionals. Based on this assumption, it is believed that an investigation of the quality of life of elderly patients undergoing dialysis treatment is necessary to guide the elaboration of health interventions, which should be exclusively design for this population. As a result of this new perspective, it is possible to provide improvements in the capabilities and lifestyle of elderly CKD patients because the dialysis treatment does not aim just

to prolong survival rate, but also improve quality of life of patients.

Researchers have pointed out that studies in the health-related quality of life of elderly CKD patients, which address socio-demographic data, are rare in scientific publications. Therefore, the relationship between quality of life of these patients and their age, gender, marital status, educational background, family income, and religion has to be established by current studies.

The aim of this study was to evaluate the quality of life of elderly patients undergoing hemodialysis, and identify which areas of quality of life were the most affected ones in the elderly population.

Method

It is a descriptive and cross-sectional quantitative study that was developed in a renal replacement therapy clinic of a health facility in the city of Patos, Paraíba State, Brazil. The total of patients on dialysis in the clinic was 102, who were aged between 17 and 90 years. From the total of these patients, 98 were under hemodialysis treatment. The sample of this study consisted of 58 patients undergoing hemodialysis in the renal care unit. Inclusion criteria were determined as follows: being older than 60 years; being admitted and followed up by the nephrology unit during the period of this research; showing cognitive ability to fill out two instruments. The authors chose not to include patients with less than six months of treatment, and the hemodynamically unstable patients.

The authors used two instruments as follows: (1) it had information about the characterization of the patients (identification, socio-demographic data and medical condition of the sample); (2) the World Health Organization Quality of Life - BREF (Whoqol-bref), which was used to measure the samples' quality of life. The Whoqol-bref is a questionnaire that relies on the assumption that Quality

of Life is a subjective and multidimensional construction based on individual's perception of quality of life, and is composed of positive and negative dimensions [6]. The Whoqol-bref consists of 26 questions and was cross-culturally adapted and validated in Brazilian Portuguese language [7]. The Brazilian version of the Whoqol-bref has shown reliable internal consistency measures, discriminant validity, validity criteria, concurrent validity and reliable test-retest [7].

The Whoqol-bref is divided into four domains, which evaluated respectively: physical, psychological, social relationships and environment. It also has one domain to evaluate individual's general quality of life. Each domain of the Whoqol-bref has facets that evaluate as follows: (1) Physical – pain and discomfort; energy and fatigue; sleep and rest; mobility; activities of daily living; dependence on medication or treatments; (2) Psychological – positive feelings; thinking, learning, memory and concentration; self-esteem; bodily image and appearance; negative feelings; religion; spirituality; (3) Social Relationships – personal relationships; social support; sexual activity; (4) Environment: physical safety and security; home environment; financial resources; health and social care: accessibility and quality; opportunities for acquiring new information and skills; participation in and opportunities for recreation/leisure activities; physical environment (pollution/noise/traffic/climate); transport [7]. In order to calculate the scores of the Whoqol-bref questionnaire, it was necessary to multiply the average of each domain by four. The analysis of the results was done by assigning scores for each question, which were assigned from 0 (zero) to 100 (one hundred). Zero corresponded to the worse quality of life status, and 100 to the best health status. Each domain was analyzed separately [6].

The quality of life of the elderly CKD patients was analyzed using the five domains of the Who-

qol-bref questionnaire. The average score of each domain was compared by means of seven different groups as follows: (1) 75 years old or younger elderly patients and 75 or older elderly patients; (2) gender: male or female; (3) marital status: with a partner or not; (4) educational background: ≤ 4 years of formal education or ≥ 5 years of formal education; (5) family income: ≤ 2 Brazilian minimum wages or ≥ 3 Brazilian minimum wages; (6) labor activity: performing or not performing; (7) religion: Catholic or non-Catholic. The nonparametric Wilcoxon–Mann–Whitney U-test was used for the discrete quantitative variables, and the 5% significance was adopted. Data collection was performed between April and May 2016 during hemodialysis sessions. The patients were individually interviewed. Data were initially organized in an Excel database for Windows XP and later analyzed using SPSS version 21.0.

All the procedures of this study were in accordance with the national and international resolutions on the conduction of research with humans.

The authors state that they have no conflicts of interest.

Results

The majority of the participants were: male (62%); aged between 60 and 75 years (84%); married (58%); retired or receiving illness aid (80%); Catholic (86%). Most patients had at least four years of formal education (80%); received between one and two Brazilian minimum wages (77%); classified their health as “fragile” or “very fragile” (58%). About physical activity and leisure, 84% and 78% of the respondents affirmed not performing any of the activities, respectively.

In regard of the length of hemodialysis, it was found that 80% of the patients had been on hemodialysis for more than a year, and its prevalence was 60% between one and six years. About the type of the venous access for hemodialysis, 88% had

the arteriovenous fistula. In patients using double-lumen catheter, 66% were inserted into the jugular vein.

In this study, HBP was the primary cause of CKD in 48.64% of the patients, followed by DM with 27.02%. On the subject of medical conditions, all the interviewed patients declared having experienced changes in their health status, with a high prevalence of HBP (24.67%), followed by ambulation deficit (15.33%).

Regarding the quality of life of the patients measured by the Whoqol-bref questionnaire, the Physical was the most affected domain with an average of 43.94. About this finding, it was observed that the quality of life was linked to the restoration or improvement of the main health needs, such as the absence of pain and discomfort; improvement of energy, fatigue, sleep, rest, activities of daily living, and dependency on medication or treatments. The authors also pointed out the Psychological domain showed an average of 49.58. Moreover, the Social Relationship and Environment domains were reported as the best ones for quality of life (**Table 1**).

There was a significant statistical difference between quality of life of the elderly CKD patients and years of formal education in the following domains: Social Relationships ($p=0.001$), Environment ($p=0.029$) and General Quality of Life ($p=0.013$). Based on this finding, the authors claimed that a better educational background positively impacted the patients' quality of life. There was no significant

Table 1. Scores of the WHOQOL-Bref questionnaire of the CKD patients. Sousa, Paraíba State, Brazil, 2016.

Domains of the Whoqol-bref	Average	Standard Deviation
Physical Domain	43.94	17.94
Psychological Domain	49.58	14.12
Social Relationships Domain	64.48	10.76
Environment Domain	52.79	13.81
General Quality of Life	52.66	11.03

statistical difference between quality of life of the elderly CKD patients and different ages, gender, and marital status (**Table 2**).

Table 2. Scores of each domain of the quality of life of WHOQOL-Bref questionnaire of the CKD patients according to age, gender, marital status and educational background. Sousa, Paraiba State, Brazil, 2016.

Domains of Quality of Life			P value*
Age	≤ 75 years old	≥ 76 years old	
Physical	45.99(17.83)	34.37(15.16)	0.099
Psychological	44.89(14.51)	40.16(18.28)	0.7699
Social Relationships	64.47(11.05)	64.56(9.71)	0.886
Environment	51.79 (13.96)	58.05(14.81)	0.2765
General	52.85 (11.33)	51.65(9.87)	0.8634
Gender	Male	Female	
Physical	44.12(16.06)	44.15(20.83)	0.779
Psychological	50.80(13.41)	47.58(15.36)	0.355
Social Relationships	66.11(10.96)	61.82 (10.13)	0.147
Environment	53.19(14.89)	52.17(12.20)	0.7257
General	53.64 (11.57)	51.05(10.18)	0.357
Marital Status	With Partner	Without a Partner	
Physical	42.84(19.67)	45.91(15.16)	0.459
Psychological	48.42(11.70)	51.19(17.09)	0.533
Social Relationships	66.65(11.36)	61.49(9.31)	0.111
Environment	50.60(13.98)	55.82(13.30)	0.173
General	51.60(10.19)	54.11(12.15)	0.371
Educational Background	≤ than 4 years of formal education	≥ than 5 years of formal education	
Physical	43.21(16.91)	47.40(21.29)	0.715
Psychological	48.50(14.33)	53.41(13.27)	0.248
Social Relationships	62.16(10.44)	72.72(7.52)	0.001
Environment	49.97(11.46)	62.8(17.14)	0.029
General	50.64(10.60)	59.80(9.82)	0.013

*: Nonparametric Wilcoxon–Mann–Whitney U-test.

The authors also found a significant statistical difference between quality of life of the patients and family income in the Environment domain (p=0.006) and General Quality of Life domain (p=0.031). These data implied that family income greater than two Brazilian minimum wages improved the quality of life of the participants of the study (**Table 3**).

Table 3. Scores of each domain of the quality of life of WHOQOL-Bref questionnaire of the CKD patients according to family income, labor activity and religion. Sousa, Paraiba State, Brazil, 2016.

Domains of Quality of Life			P value*
Family Income	≤ two Brazilian Minimum Wages	≥ three Brazilian Minimum Wages	
Physical	44.48(18.09)	43.13(17.69)	0.781
Psychological	47.52(14.05)	55.44(13.11)	0.070
Social Relationships	63.49(11.77)	67.3(9.29)	0.146
Environment	49.38(12.55)	62.51(12.94)	0.006
General	50.81(11.08)	57.91(9.36)	0.031
Labor Activity	Performing	Not performing	
Physical	44.63(10.93)	4.01(19.26)	0.742
Psychological	46.65(10.90)	50.32(14.84)	0.457
Social Relationships	61.66(7.04)	65.19(11.46)	0.546
Environment	55.32(15.03)	52.16(13.61)	0.609
General	51.45(9.37)	52.96(11.49)	0.8367
Religion	Catholic	Non-Catholic	
Physical	45.34(18.38)	36.72(12.32)	0.274
Psychological	48.44(13.91)	56.57(14.44)	0.238
Social Relationships	63.55(9.97)	70.21(14.31)	0.219
Environment	52.96(13.77)	51.78(15.67)	0.811
General	52.67(10.66)	56.24(13.43)	0.511

*: Nonparametric Wilcoxon–Mann–Whitney U-test.

Discussion

The authors pointed out the majority of the elderly patients were male. Similar data were referred in a research performed in the countryside of Rio Grande do Sul State, Brazil, in which 70.1% of the respondents were men [8]. Regarding the age of the participants, it is noticed that over the years the body becomes more vulnerable and develop some diseases. In addition, there is also a decrease in physiological and metabolic functions that has a negative impact on the functioning of the vital organs of the body.

In consequence of the improvements in life expectancy and safety standards in the care of people performed in dialysis clinics by healthcare professionals, there has been a significant increase of elderly patients on dialysis. In consonance with this assumption, a study reported that 45.9% of the population who underwent hemodialysis in a nephrology unit were older than 60 years of age [8].

About marital status, 58% of the participants were married. Others researchers have shown that marital relationship has a positive impact on coping with diseases, medication adherence and quality of life [9, 10, 11].

Regarding the educational level of the elderly patients, it was identified a predominance of four years of study, implying that 80% of the study population had a low education background. The level of education has been identified as a predictor of good health because of its association with socioeconomic conditions.

It is also believed that patients with high education level have advantages linked to knowledge that enable them to demonstrate better emotional adaptation required by the consequences of CKD and its treatment. However, regardless of the level of education of chronic patients, promoting health education is the responsibility of each health worker because it is a gradual and a continuous process that should respect the individual preferences and cultural characteristics of the patients.

About the financial status of the participants, similar data were referred in other studies [12, 13]. The authors claimed that the family income of the elderly patients was not enough to afford their dietary requirements and vital medicines, which are often not available in the Brazilian public health system.

In this study, being a CKD patient implied in inability to perform many labor activities that may be aggravated by senility. This negative scenario is found in almost all dialysis centers and triggers physical and treatment limitations. It is also responsible for feelings of powerlessness. As result of this characteristic, inability can be characterized as a health, social and economic problem. Therefore, being employed provides feelings that go beyond self-professional accomplishment and financial dimension or family maintenance.

When the patients were asked about their health status, there was a predominance of "fragile" and "very fragile" answers. This finding was similar to the reality reported in other studies performed in different countries, where elderly CKD patients rated their health as "fragile" and "very fragile". These assumptions are classified as the predictors of morbidity and mortality, resulting from poor perception of health [14].

In a multicenter study developed in Brazil, it was reported that a self-perception of "fragile health" was increased by aging among those who spent more than 60 minutes to reach health care facilities, have three or more medical conditions and referred difficulty sleeping. Being separated or divorced were associated with lower odds of poor self-assessment of health [15].

CKD is a stressful and critical medical condition that increases fragility in elderly patients, and has more negative results when the aging characteristics impact their quality of life. Moreover, these patients have to cope with the fact of having an incurable disease that requires a painful treatment and causes limitations on social life.

About the topic of physical activity, it was observed that 84% of the study population did not practice any physical activity. It may be the result of the evolution of CKD, which limits the patient's ability to perform activities of daily living. The authors emphasized that physical activities promote a series of physical, clinical and psychological benefits. However, elderly patients require specialized treatment and constant monitoring in order to get satisfactory results from physical activities.

Concerning the practice of leisure activities, this study pointed out that 78% of the interviewed patients reported not being engaged in these activities. Similar data were found in a study developed in Vassouras, Rio de Janeiro State, Brazil, where most of the CKD patients reported not performing leisure activities. In studies on CKD patients, this finding becomes frequent in CKD patients' lives even though the treatment was a form of liberation and a significant amelioration of clinical symptoms [16].

Therefore, leisure activities can provide satisfaction and improve health of CKD patients since they help in the prevention of stress, depression and other psychological disorders. Even though these activities do not cure, they trigger laughter, happiness and well-being that are capable of causing compensatory effects on the psychological, social and cultural domains of elderly CKD patients. The lack of leisure activities happens as a result of changes in activities of daily living, continuous hemodialysis, and the use of medication at regular times.

Regarding the length of hemodialysis, a study reported that the number of months that patients were under treatment facilitates the process of hemodialysis being part of the activities of daily living and being manageable by patients. However, the commitment of emotional and social aspects was notorious [17].

About the type of venous access, the arteriovenous fistula is the best type of vascular access for hemodialysis because it allows a more effective therapy, improves survival rate and quality of life

of patients. On the other hand, in order to provide better quality of life in CKD patients, nurses should teach and guide them about the care required for the maturation and maintenance of the fistula [18].

Some evidenced-based care for arteriovenous fistulas are as follows: performing exercises with soft object; preventing electrical shock; not lifting weight by using the arteriovenous fistula arm; measuring the thrill; keeping clean and dry the post-operative dressing; avoiding measure blood pressure, administer medications and blood collections in the arteriovenous fistula arm; cleaning the arteriovenous fistula arm with soap and water before each hemodialysis session [17, 18].

In this study, there was a high prevalence of HBP and DM as the primary causes of CKD. Different findings were reported in a study developed in Itajuba – Brazil, where DM as the primary main cause of CKD, followed by HBP [19]. Because these diseases are silent, they do not demonstrate perceptible signs and symptoms. This feature makes these medical conditions more aggravating for CKD patients because they are not used to their disease and not follow a therapy that can prevent complications, such as CKD resulting from a gradual loss of kidney function.

Studies indicate that HBP has been recognized as one of the most significant risk factors for the progression of renal injury in diabetic or nondiabetic populations. HBP is also responsible for a direct impact on the generation of other factors for renal injury, including the following: activation of the renin-angiotensin system and the onset of proteinuria that is caused by the impact of uncontrolled blood pressure on glomerular hemodynamics. Other factors are related to aging, such as the decrease in elasticity of blood vessels and increase of atherosclerosis that has a negative impact on peripheral vascular resistance [20].

Regarding medical conditions during hemodialysis sessions, it was found a high prevalence of HBP and ambulation deficit. The main factors that tri-

gger HBP are fluid overload, sodium retention, interdialytic weight gain, absence of residual urine due to kidney failure to remove solutes and toxins. Other mechanisms may be involved, such as increased production of vasoconstrictors (angiotensin II), decreased of vasodilators (prostaglandins), and changes in endothelial function with impaired nitric oxide synthesis. As the result of these substances in the body, there is an increase in intravascular volume, and it increases the cardiac output [21].

The ambulation deficit comes from aging and is linked to other diseases: DM, stroke, osteoporosis, rheumatoid arthritis, pain and Parkinson's disease. In more severe forms of CKD, many organs and tissues are affected, especially the musculoskeletal system, due to the accumulation of toxic substances in the internal environment and inefficiency excretion from metabolic disorders. Consequently, CKD patients may present bone malformation or deformation, decrease in calcium and phosphorus concentrations in the blood and inefficient production of the active form of vitamin D [22].

The elderly CKD patients probably did not rate better the Physical domain because of their reduced functional capacity, presence of pain, problems and/or difficulties with sleep and inability to perform basic activities of daily living. In a study on CKD patients, the Physical was also the most affected domain [4].

The Physical domain has a significant impact on other aspects of the life of elderly patients, especially if the patient is affected by diseases and did not show proper health control. Functional impairment in the Physical domain also comes from musculoskeletal changes that occurs with aging.

In this study, it was noticed that the best quality of life domain was Social Relationships with an average of 64.48, followed by Environmental (52.79) and Psychological (49.58). A research showed that after the onset of CKD, patients often have negative feelings. Consequently, family, friends and neighbors are essential to improve patients' way to

cope with the disease and the adherence to the treatment routine necessary to the chronic medical condition [4].

The authors pointed out that Psychological was the second most affected domain. It may be linked to the fact that hemodialysis treatment is responsible for a repetitive and exhausting routine for CKD patients. Changes in lifestyle and occupational inactivity cause mood swing due to changes in the social, economic, physical and emotional areas that affect mental and physical health, general welfare, social interaction and patient satisfaction. Other factors, such as dependence and restrictions imposed by the treatment, fear of death, physical complications, and body alterations may add negative results in this scenario [5].

It was identified a significant statistical difference between quality of life and years of formal education in the Social Relationships domain ($p=0.001$), Environment domain ($p=0.029$) and General Quality of Life domain ($p=0.013$). Therefore, educational background is a variable that impacts the growth of quality of life because it improves personal and marital satisfaction, and support from family and friends.

The scientific field has demonstrated that lower level of education directly affects the quality of life of patients because of its negative impact on therapeutic adherence, disease control and treatment modality [5, 12].

It is believed that patients with high education have intellectual resources capable of generating better emotional adaptation to the consequences of chronic kidney disease and treatment.

In this study, family income was a variable that had an important impact on the quality of quality of the participants in the Environment domain. The authors believed that it happened because CKD patients often lose their jobs, becoming dependent on social security and family support. Moreover, high family income decreases worry about well-being; improves life satisfaction, search for health infor-

mation, and adaptation/creation of healthy environment. In addition, high family income decreases the dependence on public transportation offered by the Brazilian local health departments.

Similar data were reported in a study, which used the SF-36 questionnaire, performed in the capital of Brazil. The researchers of that study reported a statistical association between high family income and quality of life ($p=0.013$). The statistical association was also found in the following domains: functional capacity ($p=0.010$); physical aspects ($p=0,000$); pain ($p=0,024$); social aspects ($p=0.005$); emotional aspects ($p=0,000$); mental health ($p=0,000$). [23].

The limitations of this research were: not using a specific instrument to measure the quality of life of the CKD patients; the small sample.

Conclusion

The evaluation of the quality of life of elderly CKD patients undergoing hemodialysis showed that it was relatively compromised. The authors emphasized that this result was based on the variations of the analyzed domains. Because the patients had a chronic, progressive and irreversible disease, it was identified that the most affected domain was the Physical, which addressed issues relating to the health status of the participants.

On the other hand, the existence of good social relations, especially with family, increased the Social Relationship domain's score. It is necessary to clarify that for "good" individual perception of quality of life of these patients, it is recommended an advanced stage of adaptation to the disease and the chosen treatment.

There was a significant statistical difference between quality of life of the elderly CKD patients and years of formal education in the following domains: Social Relationships ($p=0.001$), Environment ($p=0.029$) and General Quality of Life ($p=0.013$). A significant statistical difference was also found between quality of life of elderly CKD patients and fa-

mily income in the Environment domain ($p=0.006$) and General Quality of Life domain ($p=0.031$).

It was founded that studies on quality of life offer strategies to health workers that allow them to measure physical, psychological, social and environmental necessities in a way to meet the real needs of elderly patients undergoing renal therapy.

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