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ORIGINAL ARTICLE

NUTRITIONAL CONDITION AND QUALITY OF LIFE OF CHRONIC KIDNEY PATIENTS

ESTADO NUTRICIONAL E QUALIDADE DE VIDA DE RENAIS CRÔNICOS

CONDICIÓN NUTRICIONAL Y CALIDAD DE VIDA DE RENALES CRÓNICOS

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ABSTRACT

Objective: to identify and correlate nutritional status, quality of life and food intake in patients with CKD on hemodialysis. ***Method:*** this is a quantitative, descriptive, observational, cross-sectional study with a non-probabilistic sample design. The study sample consisted of 63 individuals, from 21 to 86 years old. EN was assessed by anthropometric and biochemical parameters, BMI and Global Subjective Assessment (GSA). A 24-hour dietary recall was used for food consumption and, for QOL, the Kidney Disease Quality Of Life Short Form questionnaire (KDQOL-SF). ***Results:*** it was found that among the comorbidities related to CKF, diabetes prevailed (76%). According to the PEW protocol, 73% of the patients were eutrophic and, by BMI, 57% were eutrophic. ***Conclusion:*** it was concluded that the coefficients had a non-substantial or low correlation for EN and QL and food intake. Inadequate food intake and biochemical parameters were observed. ***Descriptors***: Hemodialysis; Nutritional status; Quality of life; Body mass index; Global Subjective Evaluation; KDQOL-SF.

RESUMO

Objetivo*:** identificar e correlacionar o estado nutricional, a qualidade de vida e o consumo alimentar em pacientes com DRC em hemodiálise. ***Método*:** trata-se de um estudo quantitativo, descritivo, observacional, do tipo transversal, com delineamento amostral não probabilístico. Compôs-se a amostra do estudo por 63 indivíduos, dos 21 aos 86 anos. Avaliou-se o EN por meio de parâmetros antropométricos e bioquímicos, IMC e Avaliação Subjetiva Global (ASG). Utilizaram-se um recordatório de 24 horas para o consumo alimentar e, para a QV, o questionário *Kidney Disease Quality Of Life Short Form* (KDQOL-SF). ***Resultados*:** verificou-se que, entre as comorbidades relacionadas à IRC, prevaleceu o diabetes (76%). Observou-se que, segundo o protocolo de PEW, 73% dos pacientes estavam eutróficos e, pelo IMC, 57% estavam eutróficos. ***Conclusão: concluiu-se que os coeficientes tiveram uma correlação não substancial ou baixa para EN e QV e consumo alimentar. Observou-se a inadequação no consumo alimentar e nos parâmetros bioquímicos. ***Descritores*:** Hemodiálise; Estado Nutricional; Qualidade de Vida; Índice de Massa Corporal; Avaliação Subjetiva Global; KDQOL-SF.

RESUMEN

Objetivo: identificar y correlacionar el estado nutricional, la calidad de vida y la ingesta de alimentos en pacientes con ERC en hemodiálisis. ***Método:*** este es un estudio cuantitativo, descriptivo, observacional, transversal con un diseño de muestra no probabilístico. La muestra del estudio consistió en 63 individuos, de 21 a 86 años. Se evaluó el EN mediante parámetros antropométricos y bioquímicos, IMC y Evaluación Subjetiva Global (ESG). Se utilizó un recordatorio de 24 horas para el consumo de alimentos y, para la calidad de vida, el cuestionario *Kidney Disease Quality Of Life Short Form* (KDQOL-SF). ***Resultados:*** se encontró que entre las comorbilidades relacionadas con la IRC prevaleció la diabetes (76%). Según el protocolo PEW, el 73% de los pacientes eran eutróficos y, según el IMC, el 57% eran eutróficos. ***Conclusión:*** se concluyó que los coeficientes tenían una correlación no sustancial o baja para EN y CV y la ingesta de alimentos. Se observó una ingesta inadecuada de alimentos y en los parámetros bioquímicos. ***Descriptores***: hemodiálisis; Estado nutricional; Calidad de vida; Indice de Masa Corporal; Evaluación subjetiva global; KDQOL-SF.

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INTRODUCTION

Chronic kidney disease (CKD) is defined as slow, progressive and irreversible loss of renal function, resulting in the inability of the kidneys to excrete toxic substances, leading to the need for renal replacement therapy.[1-2]

It was found that one in ten Brazilian adults have CKD and 60% are unaware that they have the problem, seeking medical help at an advanced stage of the disease. It is revealed that about 100 thousand people need dialysis treatment in the country.[3]

Recent research has shown that the causes leading to CKD are overweight and its consequences, diabetes mellitus, glomerulopathies, acute renal failure, lupus and genetic burden.[2-4]

CKD therapies are known to be performed through peritoneal dialysis, hemodialysis, kidney transplantation and/or conservative treatment. Dialysis is the process of blood filtration whereby metabolites and fluids that can cause damage to the body in excess are eliminated. Furthermore, the treatment allows the restoration of the electrolytic and acidobasic balance of the organism, but does not replace the endocrine functions of the kidneys.[2-3]

Survival and nutritional status of hemodialysis patients are associated with studies, which are multifactorially influenced, including loss of plasma protein in dialysate (up to eight grams per session), such as albumin and transferrin, as well as low speed of resynthesis, reduced food intake, early feeling of fullness, anorexia and microalbuminuria. It is revealed that protein-energy malnutrition (PEM) is one of the main factors that adversely affect these patients, with prevalence ranging from 23 to 76%.[5-7]

Regarding to nutritional assessment of these patients, the use of Body Mass Index (BMI) is positive, since there is evidence that individuals with CKD with the highest BMI have the highest survival rate. However, a complete assessment is pertinent, as no single indicator provides sufficient information for a correct nutritional diagnosis, and only BMI can underestimate or overestimate the nutritional status in pre-dialysis and post-dialysis, and may be an indirect predictor of quality of life.[3-8]

Studies have argued that quality of life research is a topic of growing interest in health research because it is able to monitor a particular population, diagnose the nature, severity and prognosis of the disease, and assess the effects of the disease. treatment. Therefore, it is important to identify how much the chronic condition interferes with the activities of daily living and the perception of individual well-being in the case of patients undergoing hemodialysis treatment.[9-10]

OBJECTIVE

- To identify and correlate nutritional status, quality of life and food intake in patients with CKD on hemodialysis.

METHOD

This is an observational, cross-sectional study. The non-probabilistic sample design was adopted for convenience. As the dependent variable of the study, EN was used and, for its evaluation, the anthropometric parameters weight, height and BMI were used, as well as the pre-dialysis and post-dialysis urea, potassium, phosphorus, hemoglobin and albumin, in addition to analyzing the evaluation by ASG.

Pre-dialysis and post-dialysis weights were collected directly from patients' records, as well as height and biochemical parameters. Dry weight (pre-dialytic) is used as reference after fluid withdrawal during HD session.

BMI was calculated from dry weight and height. It is pointed out that the index is often used to define obesity, as it reflects the ratio between weight and height [weight (kg)/height^2 (m)] and recommends the variation between 18.5 and 24.9kg/m^2 as appropriate, with results> 25kg/m^2 considered overweight and over 30kg/m^2, obesity. In this study, we used, in conjunction with this parameter, the Protein Energy Wasting (PEW) protocol, which indicates that protein-energy waste (PEW) is the state of decreased body reserves of protein and energy fuels (ie body proteins and fat masses). This abnormality is often associated with decreased metabolic stress-related functional capacity.[11]

It's recommended that four main and established categories be recognized for the diagnosis of PEW: biochemical criterion (albumin <3.5 g per 100 ml); low body weight (BMI <23 kg/m^2, total body fat reduction or 5% weight loss over three months); decreased muscle mass and low protein or energy intake. It is then indicated that at least three of the four listed categories (and at least one test in each of the selected categories) are satisfied for the diagnosis of kidney disease-related PEW.

The data was interpreted from the reference values stipulated by the Clinical Analysis Laboratory of the Service (Figure 1).

Exam	Reference
Pre Urea	130-200 mg/dl
Post Urea	10-40 mg/dl
Phosphorus	4.5-6.0 mg/dl
Potassium	3.5-5.5 mm Hg
Hemoglobin	11-12 g/dl
Albumin	≥ 3.5 mg-dl

Figure 1. Reference values for the interpretation of laboratory tests-CKD.
Source: Service Clinical Analysis Laboratory

The Global Subjective Assessment (GSA) was performed by analyzing physical signs indicative of PED, with complete inspection of hair and nails, skin, lips and mouth and others that may show signs indicative of protein, vitamin and mineral deficiencies.[11]

Food consumption was analyzed through the 24-hour recall using the multiple-step technique, dividing this phase into three distinct steps: quick list, detailed description and evaluation. All food and drinks consumed by the volunteers during the previous day were recorded without interruption by the interviewer; home measurements, time and place of each meal were reported and at the end all foods and beverages, home measurements and time and place of each meal were resumed. [12]

Dietary intake was evaluated and energy was verified, considering, until 60 years of age, the recommendation of 35 to 40 kcal and, for volunteers aged ≥60 years, 30 to 35 kcal/kg of current or ideal weight. The intake of macronutrients - carbohydrates was studied, with a recommendation of 50 to 60% of the total caloric value (TCV), protein, considering 1.1 to 1.2 g/kg (> 50% of high biological value), and lipids, with a recommendation of 25 to 30% of TCV -, as well as micronutrients - potassium, with a recommendation of 40 mg/kg. kg, phosphorus, recommended 800 to 1000 mg/day, and iron, recommended 8 mg for men and 15 mg for women.[11]

Independent variables were information on age, physical activity, work, gender and economic level. Age was analyzed in full years. The practice of physical activity and work activity were evaluated on a dichotomous scale. The economic level was classified according to the Brazil Criterion proposed by the Brazilian Association of Research Companies.[13]

Quality of life was analyzed using the instrument KDQOL-SF, validated and translated for the Brazilian population.[14] It is a questionnaire consisting of 36 items and eight dimensions, as follows: Functional capacity; Physical aspects; Ache; General state of health; Vitality; Social aspects; Emotional aspects and mental health. Dimensions with a final score of zero to 100 were evaluated, where zero represents the worst state of health and 100, the best state of health. Questionnaire applied by researcher during HD sessions.

From the responses, in each phase of each category, a score from zero (most compromised) to 100 (least compromised) was obtained, and the data were individually tabulated.

To participate in the study, HD patients were selected at a Regional Reference Center in the Southwest of Minas Gerais, from a Santa Casa de Misericórdia, aged over 18 years and residing in the city of data collection.

Patients under 18 years of age, with treatment time of less than three months, non-residents of the city of Passos, Minas Gerais, amputees, bedridden and unable to eat orally, were excluded from the study, as well as individuals who did not agree to participate in the research, those without the cognitive preserved to answer the questions, patients who, during the interview, felt ill (hypotension, nausea), patients who died during the data collection period and those transplanted.

Descriptive statistics were used for all study variables (AN, age, gender, physical activity, work, socioeconomic level and EN), with the help of the SPSS Statistics, version 21 program.

Nutrient intake was considered a dependent variable of energy consumption, therefore, the results of the micronutrients were adjusted according to the energy parameter, performing the simple linear regression analysis, using, as an independent variable, the energy consumed and, as a dependent variable, micronutrient consumption.

Pearson's correlation coefficient was calculated to assess the linear association between food intake obtained through R24h, EN and QOL, obtained through the questionnaire. Correlation coefficients were described as follows: non-substantial (0–0.1); low (0.1–0.3); moderate (0.3–0.5); high (0.5–0.7); very high (0.7–0.9) and close to ideal (0.9–1).

Pearson's correlation coefficients were identified in their crude form, adjusting them according to energy. These values ranged from 0.179 to 0.317.

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Ethics and Research Committee of the Minas Gerais State University and the Santa Casa de Misericórdia de Passos (MG) (CAAE process 68637117.1.0000.5112, opinion number: 2.135.364).

RESULTS

Data from the chart were collected from 63 individuals, of which 34 (54%) were male and 29 (46%) female. It was found that the average age was 57.9 ± 14.7 years, with a minimum of 21 and a maximum of 86 years.

Regarding the practice of physical activity, it was found that 50 (79%) do not practice any type of physical exercise. Regarding work activity, 52 (83%) reported not working.

Regarding the economic class, three (5%) belong to class A, two (3%), class B1, 22 (35%), class B2, 12 (19%), class C1 , 16 (25%), to class C2 and eight (13%), to classes D and E.

Regarding the level of education of the head of household, 19 (30%) are illiterate or have incomplete elementary school; 19 (30%) have completed elementary school I or incomplete elementary school II; 13 (21%) had incomplete high school or higher education and seven (11%) had completed higher education.

It was found that the time of dialysis treatment ranged from four to 206 months, with an average of 61 ± 50 months.

Among the participants in this study, 25 had other CKF-associated comorbidities: 19 (76%) had diabetes; three (12%) have hypertension and three (12%) have diabetes and hypertension.

Table 1 shows the nutritional diagnosis according to the participants' BMI.

Table 1. Distribution of participants according to nutritional diagnosis according to Body Mass Index (BMI) (1995) and PEW Protocol (2008). Passos (MG), Brazil, 2017

PEW Protocol			Body Mass Index (IMC)		
Nutritional diagnosis	**n**	**%**	**Nutritional diagnosis**	**n**	**%**
Malnutrition/risk	5	8	Low weight	3	5
Eutrophic	46	73	Eutrophic	36	57
			Overweight	14	22
Overweight	1	2	Obesity	10	16
			Low weight	3	5
Obesity	11	17			
Total	**63**	**100**	**Total**	**63**	**100**

According to the classifications for biochemical exams, it was found that 33 (52%) surveyed showed adequacy of predialysis urea levels, while 25 (40%) had levels below the recommended and five (8%), levels above the recommended.

Regarding post-dialysis urea, 35 (56%) were found to be adequate and 28 (44%) had higher levels than recommended.

Regarding potassium levels, 33 (52%) respondents had adequate rates, while 29 (46%) presented hyperkalemia and one (2%), hypokalemia.

Regarding phosphorus levels, 24 (38%) had adequate phosphorus levels, 24 (38%) had hypophosphatemia and 15 (24%) had hyperphosphatemia.

It was registered that, 19 (30%) individuals had adequate hemoglobin levels, while 28 (44%) had levels below the recommended and 16 (25%) above the recommended. Regarding albumin, 25 (40%) of respondents showed adequacy and 38 (60%) had lower levels than recommended.

Table 2 shows the mean, standard deviation, minimum and maximum energy consumption, macronutrients and micronutrients of respondents obtained by applying and determining the 24-hour recall.

Table 2. Mean, standard deviation, minimum and maximum energy consumption of macronutrients and micronutrients of hemodialysis patients according to the 24-hour recall. Passos (MG), Brazil, 2017.

Variables	Average±SD	Minimum	Maximum
Energy (kcal)	943.72±458.99	5	2303
Carbohydrate (g)	125.68±73.88	0.84	434.46
Protein(g)	51.12±29.39	0.4	120.69
Protein HBV* (%)	34.60±24.08	0	101.11
Lipids (%)	23.69±8.19	3.58	41.25
Phosphorus(mg)	627.26±352.62	8	1646.74
Iron (mg)	8.18±4.16	0.2	18.58
Potassium(mg)	1400.74±968.46	49.05	4975.63

*High biological value

The average daily energy intake was 943,72 kcal and consumption ranged from five to 2303 kcal/day. It was found that, according to the estimated R24h value, 97% (n = 60) of the participants had the energy intake below the recommended and only 3% (n = 2) showed an adequate consumption. The average carbohydrate intake was 125.68 grams/day, with consumption ranging from 0.84 to 434.46 grams/day, and 31% (n = 19) had lower than recommended intake, 42 % (n = 26), adequate intake and 27% (n = 17), intake higher than recommended. Protein consumption was analyzed considering that Martins (2010) recommends 1.1 to 1.2 grams/kg of current daily weight, and the results of this study showed that most participants consume less protein than recommended, being 74% (n = 46) below the recommended. Only 16% (n = 10) had adequate consumption and 10% (n = 6) had consumption above the recommended. It was found that for the consumption of high biological value protein, 69% (n = 43) of the participants had adequate consumption, while 31% (n = 19) had consumption below the recommended.

The micronutrients, phosphorus, iron and potassium were analyzed, revealing that, for the recommendation of phosphorus ingestion (mg), 76% (n = 47) had consumption below the recommended, while only 8% (n = 5). presented adequate consumption and 16% (n = 10), above the recommended. Regarding iron consumption, 69% (n = 43) had lower than recommended consumption, 24% (n = 15), adequate consumption and 6% (n = 4) had intake above the recommendation. Regarding potassium consumption, 87% (n = 54) had lower than recommended intake, only 2% (n = 1) had adequate intake and 11% (n = 7) had higher than recommended intake. Correlation between the micronutrient intake estimated by R24h and the nutritional status classification according to BMI was performed and Pearson's correlation was calculated (Table 3). It is noteworthy that the coefficients had non-substantial and low correlations for all micronutrients. The logarithmic transformation of the raw values was performed, an indispensable condition to estimate the correlation coefficient. It was noticed, after the adjustment by energy, that the correlations ranged between 0.212 and 0.213 and remained low.

Table 3. Pearson's correlation coefficient between iron, phosphorus and potassium intake assessed by the 24-hour recall (R24h) and the classification of nutritional status according to BMI of hemodialysis patients. Passos (MG), Brazil, 2017

Variables	Raw[a]	Adjusted by energy
Iron	0.317	0.213
Phosphorus	0.0598	0.212
Potassium	0.179	0.212

Table 4 shows the mean, standard deviation, minimum and maximum values of the generic dimensions of the KDQOL-SF, in which the highest scores were related to social aspects and mental health, while functional capacity and general state. had the lowest scores.

Table 4. KDQOL-SF category scores of patients on hemodialysis at Santa Casa de Misericórdia de Passos. Passos (MG), Brazil, 2017.

Categories	N	Minimum	Maximum	Average	SD
Functional capacity	63	0	100	47	31
Limitation due to physical aspects	63	0	100	63	39
Pain	63	40	100	65	29
General state of health	63	5	100	58	27
Vitality	63	0	100	62	28
Social aspects	63	12	100	82	26
Limitation due to emotional aspects	63	0	100	66	41
Mental health	63	12	100	75	24

Table 5 shows the correlation analysis between the classification of nutritional status according to BMI and KDQOL-SF category scores, calculated by Pearson correlation. It was concluded that the coefficients had non-substantial or low correlations.

Table 5. Pearson's correlation coefficient between the classification of nutritional status according to BMI and KDQOL-SF category scores of hemodialysis patients at Santa Casa de Misericórdia de Passos. Passos (MG), Brazil, 2017.

Categories	Pearson's correlation
Functional capacity	0.108
Limitation due to physical aspects	0.074
Pain	0.032
General health state	0.254
Vitality	0.212
Social aspect	0.107
Limitation due to emotional aspects	0.146
Mental health	0.368

Table 6 shows the physical signs identified in hemodialysis patients that may be related to nutritional deficiencies.

Table 6. Physical signs that may be related to nutritional deficiencies of hemodialysis patients at Santa Casa de Misericórdia de Passos. Passos (MG), Brazil, 2017.

Part of the body/signs	n	%
Hair and nails		
- Sinais de bandeira (despigmentação transversa do cabelo)	1	1
- Easily pluckable hair	4	6
- Scarce hair	9	13
- Corkscrew hair and curled at the root	1	1
- Transverse wrinkling in the nails	1	1
Skin		
- Flaking	7	10
- Appearance of celophane	1	1
- Cracky	10	15
- Petechia (especially peripheric ular)	3	4
- Purple	13	19

- Yellow pigmentation	8	12
Neurological		
- Headache	1	1
Others		
- Cardiac insufficiency	1	1
- Edema	8	12
Total	**68**	**100**

DISCUSSION

It is known that CKD is considered a public health problem, considering the increased incidence and prevalence in the general population. This is attributed to population aging, the increasing number of cases of chronic noncommunicable diseases such as hypertension and diabetes mellitus, and exposure to environmental factors.

Most HD patients with CKF in this study were male, comprising 54% of the cases, and the age range ranged from 21 to 86 years, with a higher incidence of the elderly population.[15-6]

It was found that most patients undergoing hemodialysis (83%) were unable to perform paid activities. Unemployment among chronic kidney disease patients in renal replacement therapy programs is known to be a common problem.

Regarding education, it was noticed that the data of the researched population correspond to the Brazilian reality in which a large part of the population does not have the complete Elementary School.[16]

Recent studies have shown that the existence of other chronic diseases becomes a factor that compromises the quality of life of patients with HD, since many patients with these diseases are unaware that they have or still have little knowledge about them and, consequently, they do not adhere to treatment as they are silent diseases.[17-9]

It was also verified that, regarding the EN, the data of this study show that the majority of the participants presented eutrophy for both the classification according to the BMI and the PEW protocol. The eutrophic index was 54.84% and low weight was observed in only 12.90% of the patients studied. In a study by Rimsevicius et al. (2016), that the nutritional status rates revealed that 57.6% (57) of the patients were eutrophic, 28.3% (28), moderately malnourished and 14.1% (14), severely malnourished.[20]

Another study contrasts with 80% of malnutrition among the patients evaluated.[21]

It is noteworthy that BMI has low sensitivity to detect malnutrition in patients with chronic kidney disease in HD, because water retention is very common in these patients, thus, the use of post-dialytic weight to avoid misdiagnosis is indicated. It is pointed out that there is not a single criterion that can be used to identify the EN of dialysis patients, which hinders the identification of malnutrition, therefore, the assessment of nutritional status should be performed by a set of methods to obtain the adequate nutritional diagnosis such as food intake.[22]

High rates of malnutrition have been reported in dialysis patients. Waste protein energy (PEW) is the state of decreased body reserves of protein and fat mass and is often associated with mortality, comorbid conditions and reduced activities of daily living. To improve prognosis, early identification of patients with PEW and interventional treatments for their nutritional conditions are needed.[16]

It is suggested, by the difference in the distribution of patients between the two criteria, that they can be diagnosed differently, having the PEW based on each criterion; Therefore, reference values of the criteria for the diagnosis of PEW in hemodialysis patients are required.[23]

It is understood that adequate or inadequate food intake favors or impairs the nutritional status in these patients, and nutrient losses during the hemodialysis procedure may be an important factor for malnutrition. It was found in this study that the caloric-protein intake is below the recommended for the researched population.

It was noted in one study that energy intake in renal patients on hemodialysis treatment was below recommendations, becoming more severe than low protein intake.[24]

It is noteworthy that the evaluation of the quality of the protein ingested is also very relevant, that is, a minimum of 50% of high biological value proteins (HBV) must be prioritized in order to ensure the intake of essential amino acids. In this study, it was observed that the amount of HBV proteins recorded was within the recommended (69%), while 31% of the patients had consumption below the recommended, corroborating the research reported.[24]

It is contextualized that serum albumin had been identified as a predictor of mortality in hemodialysis (HD) patients. It is understood that the normalized protein catabolic rate (nPCR) less than 0.8 or greater than 1.4 g/kg/day was also associated with higher mortality. It is emphasized that there are no previous studies demonstrating the efficacy of the combination of serum albumin and nPCR to predict mortality in chronic HD patients.[25]

The generic dimensions of KDQOL-SF were analyzed and the highest scores were related to

social aspects and mental health. Similar data were found according to which the social function dimension presented an average score of 80.36, which confirms that this category contributes to the better quality of life in the studied sample.[14]

In this study, it was pointed out that the functional capacity and general health had the lowest scores, corroborating this research.[22]

It was revealed that the QOL of patients with CKD undergoing HD is mainly compromised in the categories general health, vitality and emotional aspects, since these dimensions particularly evaluate the performance in daily and work activities, the sensation of discouragement and lack of energy, which are frequent symptoms in chronic kidney.

Hyperphosphatemia is known to be common in dialysis patients, and dietary phosphorus restriction is an effective way to control serum phosphorus level.[1-2] It is emphasized that adequate dietary protein intake is extremely important for dialysis patients.[3] However, it is important to deepen the knowledge of the inherent relationship between phosphorus and protein content in foods, making it difficult to plan a low phosphate diet without restrictions on protein intake.[25]

In this study, it was found that the coefficients had non-substantial or low correlations between nutritional status and quality of life and food consumption. Different results were observed, which showed a positive correlation between caloric, protein and fiber intake, calcium and carbohydrate and quality of life.[5]

It is noteworthy that the physical examination aims to assess the presence of abnormalities that may reflect inadequate nutrition, as well as to determine if the patient needs further evaluation. In this study, there is a predominance of both signs of rapid prevalence, such as changes in hair, eyes, skin, lean and fat mass, and edema, as well as body systems such as the nervous system.[9]

Therefore, based on the analysis of food consumption and QOL, the need for support groups, understood as support from the established relationships, whether family, social or related to the multidisciplinary health team, raising the levels of quality of life and reducing rates of depression, hospitalization and mortality.

It is emphasized that these data need to be used with caution, as the quality of food of these patients is extremely important, and increasing the energy consumption in a disordered manner, without guidance based on the recommendations, can negatively affect the general state of the patient.

CONCLUSION

The prevalence of eutrophic patients was observed; however, inadequate food intake and biochemical parameters were recorded, especially in relation to phosphorus, albumin and potassium, and protein intake below the recommended. It is noteworthy that, although food consumption did not correlate with QOL and EN in this study, it is known that there is an association between them. It is argued that diet therapy and specific nutritional guidelines underlie the treatment of CKD and are necessary to decrease nutritional complications throughout treatment and decrease comorbidities.

It is estimated that this population needs greater clinical, psychological and nutritional follow-up, since the beginning of treatment, in order to prevent and minimize the deterioration of EN and QOL, which are common due to the disease and treatment. The involvement of a multidisciplinary team is essential. Studies with a larger patient population are suggested, as performed in most other research on the subject, and the association and comparison between different assessment methods.

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