

Original Article

Comparison of occupational performance between dialytic treatment modalities

A comparação do desempenho ocupacional entre as modalidades de tratamento dialítico

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Abstract

Introduction: Chronic Kidney Disease is a progressive and irreversible pathology, which can affect performance skills in occupational activities. **Objective:** In this study, the occupational performance of patients undergoing hemodialysis and peritoneal dialysis at a Renal Replacement Therapy Service was compared. **Method:** The research was observational, cross-sectional, descriptive, and analytical, with a sample of (n = 53) 13 in peritoneal dialysis and 40 in hemodialysis. Data on patients on peritoneal dialysis were collected, using a sociodemographic questionnaire and the Canadian Occupational Performance Measurement protocol. Only data on the occupational performance of patients on hemodialysis were collected for comparison purposes with those on peritoneal dialysis. The data were analyzed with statistical tests, with a p-value <0.05 being considered. Most patients are male, widowed/divorced, and with an income of up to one salary. **Results:** With the Canadian Occupational Performance Measure, it was possible to associate the occupational performance of patients on peritoneal dialysis and hemodialysis, in which individuals who perform peritoneal dialysis have better occupational performance than those on hemodialysis. Spearman's correlation test showed that there is a strong positive (rs = 0.9861) and highly significant (p <0.0001 *) correlation between satisfaction and performance of patients on peritoneal dialysis. **Conclusion:** Thus, the study demonstrates that there is a relationship between occupational performance and the type of dialysis treatment.

Keywords: Chronic Kidney Diseases, Peritoneal Dialysis, Occupational Therapy.

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Resumo

Introdução: A Doença Renal Crônica é uma patologia progressiva e irreversível, podendo afetar as habilidades de desempenho nas atividades ocupacionais. **Objetivo:** Neste estudo, comparou-se o desempenho ocupacional de pacientes que realizam hemodiálise e diálise peritoneal de um Serviço de Terapia Renal Substitutiva. **Método:** A pesquisa foi do tipo observacional, transversal, descritiva e analítica, tendo uma amostra média de (n=53), sendo 13 em diálise peritoneal e 40 em hemodiálise. Foram coletados os dados dos pacientes em diálise peritoneal, a partir da aplicação de um questionário sociodemográfico e econômico, e no protocolo Medida Canadense de Desempenho Ocupacional. Os dados do perfil sociodemográfico e do desempenho ocupacional de pacientes em hemodiálise foram coletados para fins de comparação com aqueles em diálise peritoneal. Os dados foram analisados com testes estatísticos, sendo considerado p-valor<0.05. **Resultados:** A maioria dos pacientes é do sexo masculino, viúvo/divorciado e com renda de até um salário. Com a Medida Canadense de Desempenho Ocupacional foi possível comparar os desempenhos ocupacionais dos pacientes em diálise peritoneal e hemodiálise, nos quais os indivíduos que realizam diálise peritoneal possuem melhor desempenho ocupacional que aqueles em hemodiálise. O teste de correlação de Spearman mostrou que existe forte correlação positiva ($r_s=0.9861$) e altamente significativa ($p<0.0001^*$) entre a satisfação e o desempenho dos pacientes em diálise peritoneal. **Conclusão:** Sendo assim, o estudo demonstra que há relação entre o desempenho ocupacional e a modalidade de tratamento dialítico.

Palavras-chave: Doença Renal Crônica, Diálise Peritoneal, Terapia Ocupacional.

1 Introduction

Chronic Kidney Disease (CKD) is defined as abnormalities of kidney structure or function for more than three months, with health complications. Its staging depends on the cause of the disease, glomerular filtration rate, and albumin level (International Society of Nephrology, 2013).

According to Jha et al. (2013), the prevalence of chronic kidney patients varies between 8% to 16% worldwide. The countries with the highest prevalence of chronic kidney patients, in the five stages of the disease, are Taiwan, the United States, Mexico, Japan, and Shanghai. In the United States, the black and Latin American population reach the final stage of the disease earlier than the white population – with a mean age of 57 and 58 years old versus 63 years old, respectively.

In Brazil, the prevalence of kidney patients is still uncertain. Population estimates point to about 1.5% for self-reported kidney disease and 3% for hypercreatinemia, corresponding to between 3 and 6 million adults (Marinho et al., 2017).

In developed countries, CKD has a high prevalence and it is associated with Diabetes, Systemic Arterial Hypertension (SAH), and an aging population. In developing countries, such as Brazil, we observed lower rates of prevalence and incidence in part due to less notification and offer of treatment. Besides Diabetes and SAH, they also have infectious diseases and glomerulonephritis as the main causes of the disease (Draibe, 2014).

According to the Census of the Sociedade Brasileira de Nefrologia (2017), about 126,583 individuals with CKD were inserted in a Renal Replacement Therapy (RRT)

center undergoing dialysis (Hemodialysis and Peritoneal Dialysis), having an increase of 40 thousand new cases than the previous year.

Most of these patients undergo treatment by the Unified Health Care System (SUS), representing 80% in the national territory, with Hemodialysis (HD) as the most common treatment modality in the RRT centers (Sociedade Brasileira de Nefrologia, 2018).

In HD, the patient is connected to a cycling machine through an arteriovenous fistula that cleans and filters the blood, removing harmful residues from the body, such as salts and excess liquid, helping to maintain the electrolyte balance. This procedure is performed at least three times a week for four hours on average (Madalosso & Mariotti, 2013; Brasil, 2014; Rudnicki, 2014).

RRT is frequently not planned, that is, it occurs urgently during kidney failure. Therefore, it is not performed through definitive working access, and it usually starts with HD. However, Peritoneal Dialysis (PD) has emerged as a viable and safe alternative therapy to HD in the unplanned dialysis (Mendes et al., 2017).

In PD, the individual's peritoneum is used as an exchange membrane between the organism and the dialyzer fluid due to the network of capillaries and lymphatics present in this region, performed at the home and outpatient level, contributing to greater independence of the individual during his treatment process (Sociedade Brasileira de Nefrologia, 2016; Tavares & Lisboa, 2015).

There are two modalities of PD: Continuous Ambulatory Peritoneal Dialysis (CAPD) performed daily for 30 minutes, with intervals of three to four hours between an exchange; and Automated Peritoneal Dialysis (APD), usually performed at night and the number of cycles will depend on the medical prescription (Sociedade Brasileira de Nefrologia, 2016).

According to Vieira (2009) and Souza (2012), patients with CKD may experience physical and emotional stress because their daily lives are mostly filled with activities related to the disease, such as medical appointments, dialysis sessions, diets. They also have the impossibility of performing activities that require a lot of effort since most patients with CKD feel weak and tired, hindering the normal performance of their occupations, especially in the areas of productivity, Activities of Daily Living (ADL), and recreation, which can break, consequently, their social interaction.

The study by Ramos et al. (2015) with adolescents undergoing hemodialysis treatment pointed to the impoverishment of activities and social relationships before, during, and after HD sessions, feeling restricted only to biomedical techniques and approaches.

Corroborating this, Madalosso & Mariotti (2013) list different factors that impair the functionality and social life of these patients. Most of them associate the time spent for HD sessions as one of the main factors that contribute to the disorganization of the routine, psychosocial commitments, such as well-being and satisfaction.

A study carried out in an RRT sector, in the State of Pará, indicated that most PD patients had already undergone HD before this modality, and the majority reported improvement and more satisfaction with the exchange of therapy, stating that HD is more aggressive, causing more changes in daily life (Moraes et al., 2018).

This study also emphasizes the impact of PD on the daily lives of these patients, especially on the occupational performance of activities away from home due to the dependence on treatment (Moraes et al., 2018).

Occupational performance is the result of the interaction between the person, the environment, and the occupation, in which individuals are constituted by physical,

psycho-affective, and cognitive aspects, and influenced by physical, social, cultural, and institutional environments (Law et al., 2009).

As a health profession that has the skills and competencies to act in addressing the occupational performance of its patients, highlighting those having chronic diseases, occupational therapy promotes significant activities, using validated protocols such as the Canadian Occupational Performance Measure (COPM) to assess the occupational performance of individuals who, for some reason, had their occupations affected (Law et al., 2009; Pontes & Polatajko, 2016).

COPM is a semi-structured protocol that assesses occupational performance in three central areas: self-care, productivity, and recreation. In this, the individual can list the most significant activities and classify them according to their self-reported performance and satisfaction (Law et al., 2009).

Given the above and considering the complexity of CKD and its continuous treatment, this research aimed to describe the sociodemographic, socioeconomic, and housing profile of PD patients and to compare the occupational performance of patients in two dialysis modalities of an RRT service in one public referral hospital in the state of Pará.

2 Method

This is an observational, cross-sectional, descriptive and analytical study conducted with patients with CKD undergoing treatment at the RRT service, from September 2016 to February 2017, after approval by the Ethics Committee for Research with Human Beings of the Hospital de Clínicas Gaspar Vianna Foundation (FHCGV), with approval number 58303816.4.0000.0016.

2.1 Population and sample

The population (N = 64) of the study had patients of both genders with CKD, aged between 20 and 83 years old, undergoing dialysis at the RRT service of a public reference hospital in the State of Pará.

In the first stage of the research in the collection of data for the sociodemographic and socioeconomic profile, 64 individuals agreed to participate in the research, 51 in HD (79.69%), and 13 in DP (20.31%). In the second stage, for the application of COPM, 13 patients on PD (24.53%) and 40 on HD (75.47%) participated.

2.2 Instruments for data collection

The authors developed a socio-demographic and economic questionnaire with the variables, age, gender, marital status, income, socio-environmental conditions, and education for patients who underwent PD. For HD patients, we used the variables age, gender, and marital status available in the institution's database.

We used COPM for the assessment of occupational performance, which consists of a semi-structured interview. First, the patient identifies the daily activities he wants and the ones he needs to perform, assigning to them a score ranging from 01 (minimum value) to 10 (maximum value), referring to the degree of importance. Subsequently, the patient points out five activities that have performance problems, with scores ranging from 01 to

10, considering their performance and satisfaction with the result of the task performed (Law et al., 2009; Greggio, 2011).

The duration of the application of the protocol varies from 15 to 30 minutes and allows the patient to identify his problems, through satisfaction and the current performance in a given activity, increasing the patient's involvement with his therapeutic process, and acting as co-responsible for his health (Law et al., 2009).

2.3 Procedures

We invited patients who underwent PD to participate in the study on the day of the clinical consultation with the nephrologist, being approached before medical care in the DP consultation room. After signing the Informed Consent Form, we applied the sociodemographic questionnaire and the COPM. The participants' medical records were also accessed to collect complementary information for the sociodemographic script such as data regarding their housing, information that is routine in the service of this RRT. For the comparison of the sociodemographic profile and occupational performance of patients on PD with those on HD, we collected information on the profile and occupational performance of patients on HD in the database of the Research Group on Chronic Diseases and Preventive Health at FHCGV, since COPM had already been applied to these patients in a survey conducted by the group in 2016.

2.4 Data analysis

The data from the creation of the socio-demographic, socioeconomic, and housing profile were analyzed using qualitative variables, presented by absolute and relative frequency distributions, while the quantitative variables were presented by measures of central tendency and variation. The G test of these data compared the proportions considered equal, weighting the significance as $p\text{-value} = <0.05$. A student's t-test was used to assess occupational performance in men and women on PD. The Spearman Correlation test was used in the COPM Medians (performance and satisfaction) for the dialysis modality (HD and SD). The alpha level = 0.5 (Alpha error 5%) was previously fixed to reject the null hypothesis, in which it would compare occupational performance with the dialysis modality. The biostatistical analysis used the Statistical Analysis Model (SAM) software and the BioEstat version 5.3 program analyzed the hypothesis tests.

3 Results

The profile of the research participants was between 37 and 83 years old, with a central tendency for 65 ± 12 years old, and, in the group of patients on PD, 53.8% are female and 46.2% male.

HD patients were between 20 and 70 years old, with a central tendency for 60 ± 10 years old, with 51% female and 49% male.

Most participants in PD have a widowed or divorced marital status, corresponding to a significant statistic of 53.8%, $p = 0.0202^*$. For HD patients, the unreported variable was the prevalent one (58.8%) (Table 1).

Table 1. Characterization of $n = 64$ patients on peritoneal dialysis and hemodialysis. FHCGV, Belém/PA, 2017.

Patient characteristics	PD			HD		
	n	%	p-value	n	%	p-value
Gender						
Male	6	46.2	0.7458	25	49.0	0.8892
Female	7	53.8		26	51.0	
Marital status						
Single	2	15.4	0.0202*	2	3.9	0.3438
Married	4	30.8		12	23.5	
Common-law marriage	0	0.0		5	9.8	
Widowed or Divorced	7	53.8		2	3.9	
Not informed	0	0.0		30	58.8	
Occupation						
Home Activity	2	15.4	0.0112*	3	5.9	0.0052*
Recreation	0	0.0		0	0.0	
Study	1	7.7		2	3.9	
Work	2	15.4		2	3.9	
Others (Retirees or pensioner)	8	61.5		16	31.3	
Not informed	0	0.0		28	54.9	

*Adherence G test for equal expected proportions. Source: Research Protocol.

The main occupation of the participants in PD was related to other categories, notably the subcategory, retirees/pensioners (8 participants), while most of those in HD did not inform it (28 participants). Most patients were not identified by the occupation they performed, but rather by the form of remuneration acquired (Table 1).

As for the level of education and income of patients and their caregivers (Table 2), the study shows that there is a tendency for the patient to have an education level equal to Complete High School (46.2% $p\text{-value} = 0.0032^*$), with income between 1 and 2 minimum wages (84.5% $p\text{-value} = <0.0001^*$). The caregiver's educational level was not statistically significant; however, the caregiver's income tended to be less than 1 minimum wage (61.5% $p\text{-value} = 0.0118^*$).

Table 2. Characterization of n = 13 patients on peritoneal dialysis, FHCGV, Belém/PA, 2017.

Description	n	%	p-value
Patient's education level			
Illiterate	1	7.7	0.0032*
Incomplete Elementary school	5	38.5	
Complete Elementary school	0	0.0	
Incomplete High school	0	0.0	
Complete High School	6	46.2	
Higher education	1	7.7	
Patient's income			
Less than 1 MW	0	0.0	<0.0001*
1 to 2 MW	11	84.6	
3 to 4 MW	2	15.4	
More than 4 MW	0	0.0	
Caregiver's education level			
Illiterate	0	0.0	0.4077
Incomplete Elementary school	3	23.1	
Complete Elementary school	1	7.7	
Incomplete High school	3	23.1	
Complete High School	5	38.5	
Higher education	1	7.7	
Caregiver's Income			
Less than 1 MW	8	61.5	0.0118*
1 to 2 MW	5	38.5	
3 to 4 MW	0	0.0	
More than 4 MW	0	0.0	

*Adherence G test for equal expected proportions. Source: Research Protocol.

Regarding the housing conditions, we found statistically significant values (p-value = <0.0001) with patients undergoing PD. Most patients have their own homes (84.6%), with masonry as the predominant construction (92.3%), composed mostly of 5 or more rooms (76.9%), PVC liner (76.9%), and ceramic floors (92.3%) (Table 3).

The environmental condition for the treatment of HD is the outpatient or hospital environment. Thus, there was no information on the housing condition of these individuals in the database.

Table 3. Housing characterization of n = 13 patients on peritoneal dialysis. FHCGV, Belém/PA, 2017.

Characterization of housing	n	%	p-value
Housing			
Own	11	84.6	<0.0001*
Leased	2	15.4	
Assigned	0	0.0	
Others	0	0.0	
Rooms			
1 to 2	1	7.7	<0.0001*
3 to 4	2	15.4	
5 or more	10	76.9	
Liner type			
Wood	0	0.0	<0.0001*
Plaster	1	7.7	
PVC	11	76.9	
None	1	7.7	
Others	0	0.0	
Floor type			
Wood	0	0.0	<0.0001*
Ceramics	12	92.3	
Carpet	0	0.0	
Cemented	1	7.7	
Other	0	0.0	
Construction Type			
Wood	1	7.7	<0.0001*
Masonry	12	92.3	
Other	0	0.0	
How many people live			
1 Person	1	7.7	0.9902
2 People	1	7.7	
3 People	4	30.8	
4 People	2	15.4	
5 People or more	5	38.5	

*Adherence G test for equal expected proportions. Source: Research Protocol.

In the areas of performance and satisfaction of PD patients, Table 4 shows that there are no significant differences regarding the areas of self-care, productivity, and recreation between the male and female. The area of greatest occupational performance of n = 13 study participants was productivity in both genders.

Also, in Table 4, HD individuals did not show significant differences in the areas of performance between the genders; however, in satisfaction in the areas of self-care and recreation, men and women showed differences, in which men have better satisfaction in these areas than women.

Table 4. Evaluation of COPM areas according to the patient's gender.

GROUP		PERFORMANCE			SATISFACTION			
		AUTOC	PROD	RECREATION	AUTOC	PROD	RECREATION	
PD	Male	Mean	8.6	9.2	7.3	8.5	9.0	8.0
		Standard deviation	1.5	1.8	2.3	2.4	2.2	2.4
	Female	Mean	9.0	9.7	8.9	10.0	10.0	9.7
		Standard deviation	1.1	0.8	1.9	0.0	0.0	0.8
	t-Student	(p-value)	0.3099	0.2759	0.2173	0.2632	0.1984	0.2124
	HD	Male	Mean	6.2	5.2	5.4	6.5	5.2
Standard deviation			2.2	4.5	3.4	2.0	2.1	2.4
Female		Mean	5.1	5.2	4.5	4.7	4.7	4.3
		Standard deviation	2.5	4.5	2.7	2.3	2.2	2.2
T-test		(p-value)	0.1470	1.000	0.2713	0.0117*	0.4667	0.0094*

*Student t-test to verify proportionality in performance and satisfaction between men and women. Source: Research Protocol.

Table 5. Summary statistics for COPM Performance and COPM Patient satisfaction on HD and PD. Belém/PA 2015 and 2017.

Sample size	HD PATIENTS		PD PATIENTS	
	COPM - Performance	COPM - Satisfaction	COPM - Performance	COPM - Satisfaction
	40	40	13	13
Minimum	1.0	1.0	5.0	5.0
Maximum	10.0	10.0	10.0	10.0
Median	6.50	6.15	8.8	8.8
First Quartile (25%)	4.44	4.58	6.5	8.2
Third Quartile (75%)	9.25	9.48	9.3	10.0
Arithmetic average*	6.29	6.39	8.1	8.7
Standard deviation	3.06	2.98	1.7	1.4

*between groups p-value <0.0001, Spearman correlation. rs =0.9861. Source: Research Protocol.

The COPM evaluation of PD patients (Table 5) shows that both performance and satisfaction varied between 5 and 10, with a median of 8.8. After applying the Spearman correlation test, there is a strong positive (rs = 0.9861) and highly significant (p <0.0001 *) correlation between patients' satisfaction and performance in this treatment modality. Considering that this study showed the association of the dialysis modality in the occupational performance of chronic kidney patients, we found that the performance and occupational satisfaction of patients who undergo PD are higher than those who undergo HD (Table 5).

4 Discussion

The identification of the socio-demographic and socio-environmental profile of patients in PD and HD becomes relevant due to the characterization of the studied people to guide possible clinical and therapeutic approaches, and to produce scientific evidence (Thomé et al., 2019).

In this study, we identified that most patients are female, with a mean age of 65 years old and widowed or divorced, similar to the research by Oliveira et al. (2012) and Silva et al. (2016), with disagreement only regarding marital status that had a predominance of married participants.

In the last census of the Sociedade Brasileira de Nefrologia (2018), the age of patients undergoing RRT varied between 45 and 75 years old, with a predominance of 45 to 64 years old (41.5%). Most were male.

The presence of a caregiver can offer better assistance in peritoneal dialysis procedures above all because of the division of care tasks required in dialysis, requiring attention during the procedure, or, even, the outsourcing of care to patients with disabilities to perform them. Such support can be provided by an individual with a degree of kinship or a person hired for this purpose, having a fundamental role for treatment adherence (Leone, 2016; Paula et al., 2016).

The patient's caregiver had an income below one minimum wage (61.5%) and this is maybe because he gave up his work to dedicate to the care of patients with PD.

Tavares & Lisboa (2015) point out the importance of training patients and their families for the success of peritoneal dialysis treatment. They also highlight the importance of a more accessible language about treatment, emphasizing the importance of support from the health team.

Therefore, considering the educational level of the patient and his family is essential in the training and qualification of these on PD, contributing positively to the correct understanding of CKD and its consequences.

The sanitation and housing conditions are another relevant issue for the performance of PD that according to Araújo et al. (2011) and Leone (2016) should minimally offer negative impacts to the treatment process. In this sense, we found that the sanitation and housing conditions of most participants who undergo PD (Table 3) are adequate for carrying out dialysis treatment with environmental security.

In the study by Abrahão et al. (2010) on the practice of PD at home, despite not showing statistical significance on the relationship between the conditions for performing PD and the success of therapy, the authors believe that they play a positive role in the success of dialysis application.

For occupational therapy, it is essential to assess the occupational performance of PD patients through COPM, as this will support the identification of possible performance and satisfaction problems related to activities that can be harmed by the context of treatment, which they can guide clinical practice and scientific research in the profession.

In the results presented (Table 4), we emphasized that there were no significant differences regarding the areas of self-care, productivity, and recreation between the genders. Also, the levels of performance and satisfaction were proportional. Thus, the level of satisfaction and the perception of their occupational performance is not affected in individuals who undergo PD.

However, a study by Moraes et al. (2018) points out that patients who undergo PD have their occupations affected, mainly related to work, personal care and independence outside the home due to the time invested at home for treatment with the dialysis machine since most of the compromised activities requires long periods for its performance.

In the aforementioned study, 91.6% of the participants had already undergone hemodialysis before PD and affirmed greater satisfaction with changing the dialysis modality since hemodialysis is more aggressive and causes more limitations in the occupational performance of patients (Moraes et al., 2018).

Thus, patients undergoing peritoneal dialysis may have more favorable clinical and psychosocial conditions to obtain a better quality of life, which considerably influences the performance of occupational activities and the participation of social life in a satisfactory manner due to minor complications in treatment, favorable adaptation in daily life, such as a possible continuation of work occupation and non-commuting for dialysis (Freire & Mendonça, 2013; Roxo & Barata, 2015; Pereira et al., 2016).

Thus, the comparison of the results of COPM between individuals in PD and HD of the same RRT identified divergence in the means of the performance and satisfaction variables. This last treatment modality interferes with a way to decrease the occupational performance of individuals. This factor is influenced by physical changes, limitations in daily activities, and also by unfavorable adaptations to the lives of patients on hemodialysis (Machado & Pinhati, 2014; Alfonso & Nascimento Filho, 2015).

Thus, the study by Marinho et al. (2017) states that the quality of life of patients on HD is considerably affected due to the clinical complications presented, and the unfavorable conditions for carrying out the treatment such as the routine commute to the RRT service and the session time of HD.

Also, the authors emphasize that hemodialysis considerably affects the maintenance of work occupation due to the consequences related to physical impairment and also to the time allocated to sessions (Cruz et al., 2016).

In this study, there was a direct interference of the dialysis treatment modalities in the patients' occupational performance, emphasizing the importance of evaluating this performance, and influences a better understanding and assistance for the patient undergoing treatment.

Therefore, this research highlights that changes in the occupational performance of patients with chronic kidney disease may be associated with the type of dialysis treatment, and peritoneal dialysis is the best treatment option for the performance of individuals as it provides greater freedom to perform their occupational activities and involvement in social life.

5 Conclusions

This study identified that the modality of dialysis treatment is associated with the occupational performance of the patients, and the socio-demographic data demonstrate agreement with other studies carried out in the area.

The socio-environmental issues of participants in PD demonstrated the need for minimum conditions for the effectiveness of peritoneal dialysis treatment at home, such as education, income, and housing.

Patients who undergo PD showed little interference in self-reported occupational performance from the application of COPM, with levels of performance and satisfaction being close to the maximum score of the measure.

With the application of COPM, we could compare the results of the occupational performance of patients in PD and HD, in which individuals who perform PD have better occupational performance than those in HD.

Despite the significance found in this study, we should point out the small number of patients undergoing PD and little data on the profile of HD patients as factors that limit the generalization about occupational performance and the profile of this population to other centers. Therefore, future research must be carried out to complement and compare the data obtained.

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Author's Contributions

Sônia Cláudia Almeida Pinto: advice, structuring, design, and review of the article. Flávia dos Santos Coelho: conception, elaboration, data collection, and analysis of results. Grace Kelly Cabral dos Santos: conception, elaboration, data collection, and analysis of results. Alex de Assis Santos dos Santos: statistical analysis of the data. All authors approved the final version of the text.

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