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Factors Associated with Limited Health Literacy in Patients Undergoing Kidney Transplantation

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ABSTRACT

Introduction: Limited health literacy (HL) is associated with more significant difficulties in health self-management and unfavorable outcomes in patients with chronic kidney disease (CKD) undergoing kidney transplantation (KTx). This study aimed to analyze the factors associated with limited LS in patients undergoing KTx. **Methods:** This is a cross-sectional, analytical study with 129 patients from a reference hospital in KTx in Goiânia, the state of Goiás, Brazil. A structured questionnaire containing sociodemographic, occupational, lifestyle, clinical and laboratory variables was applied. The Brief Test of Functional Health Literacy in Adults (B-TOFHLA) assessed the HL level. **Results:** The prevalence of limited HL was 34.1%. In the bivariate analysis, higher prevalences of limited HL were observed in elementary school [prevalence ratio (PR) = 1.85; confidence interval (95%CI) 1.13-3.06], lowest monthly family income PR = 2.00; 95%CI 1.17-3.43), not having internet access at home (PR = 1.83; 95%CI 1.07-3.10) and not working (PR = 2.29; 95%CI 1.12 -4.68). In the final multivariate model, the following remained associated with limited HL: having primary education (PR: 1.72; 95%CI 1.04-2.83) and not working (PR: 2.14; 95%CI 1.05-4,35). Having completed primary education and not working increased the prevalence of limited HL by 72% and more than twice, respectively. **Conclusion:** The prevalence of limited HL in the studied population is associated with greater socioeconomic vulnerability.

Descriptors: Chronic Renal Failure; Kidney Transplantation; Health Literacy; Health Education.

Fatores Associados ao Letramento em Saúde Limitado de Pacientes Submetidos ao Transplante Renal

RESUMO

Introdução: O letramento em saúde (LS) limitado está associado a maiores dificuldades de autogerenciamento em saúde e a resultados desfavoráveis em pacientes com doença renal crônica (DRC) submetidos ao transplante renal (TxR). Este estudo objetivou analisar os fatores associados ao LS limitado em pacientes submetidos ao TxR. **Métodos:** Trata-se de estudo transversal, analítico, realizado com 129 pacientes de um hospital referência em TxR de Goiânia, estado de Goiás, Brasil. Foi aplicado um questionário estruturado contendo variáveis sociodemográficas, ocupacionais, de hábitos de vida, clínicas e laboratoriais. O nível de LS foi avaliado pelo Brief Test of Functional Health Literacy in Adults (B-TOFHLA). **Resultados:** A prevalência de LS limitado foi de 34,1%. Na análise bivariada, observaram-se maiores prevalências de LS limitado em ensino fundamental [razão de prevalência (RP) = 1,85; intervalo de confiança (IC95%) 1,13-3,06], menor renda familiar mensal RP = 2,00; IC95% 1,17-3,43), não ter acesso à internet no domicílio (RP = 1,83; IC95% 1,07-3,10) e não trabalhar (RP = 2,29; IC95% 1,12-4,68). No modelo multivariado final, mantiveram-se associados ao LS limitado: ter ensino fundamental (RP: 1,72; IC95% 1,04-2,83) e não trabalhar (RP: 2,14; IC95% 1,05-4,35). Ter ensino fundamental completo e não trabalhar fortaleceram a prevalência de LS limitado em 72% e mais que duas vezes, respectivamente. **Conclusão:** A prevalência de LS limitado na população estudada está associada à maior vulnerabilidade socioeconômica.

Descritores: Insuficiência Renal Crônica; Transplante de Rim; Letramento em Saúde; Educação em Saúde.

INTRODUCTION

Kidney transplantation (KTx) is considered one of the most effective treatments for end-stage chronic kidney disease (CKD). Depending on several factors, the primary outcomes that can occur after KTx include functioning graft, rejection, and complications[1]. The worst results in KTx recipients are associated with limited health literacy (HL), characterized mainly by insufficient or mistaken knowledge of patients about CKD and its therapies[2].

HL is an individual's ability to acquire, process, understand, evaluate, and communicate health information necessary to make appropriate decisions[3]. It strongly correlates with the patient's understanding of the disease and participation in health discussions[4]. Thus, the individual's level of HL can direct how they perceive the risks to which they are exposed and the coping strategies adopted, whether they are effective or not.

Limited HL is related to restricted knowledge about the disease[5], worse health status[6], low level of knowledge about treatment[2], adoption and/or maintenance of unhealthy lifestyle habits[7] and inappropriate use of medications[8]. This may lead to ineffective self-management of CKD patient health[9], representing an additional risk for unfavorable kidney function outcomes after KTx[2].

Although the topic is crucial for understanding the results of CKD therapies in patients' lives, the literature on HL in these populations still needs to be explored. Most studies address patients undergoing pre-dialysis or dialysis treatment and adopt procedures restricted to associations through bivariate analysis. Thus, the relevance of conducting studies using multivariate analysis techniques to identify the conditioning/determining factors of limited HL in kidney transplant patients is verified.

This study aimed to analyze the factors associated with limited HL in patients undergoing KTx.

METHODS

Type and location of study

This is a cross-sectional, analytical study in a public reference hospital in KTx in Goiânia, state of Goiás, Brazil.

Population, sample and eligibility criteria

For the sample calculation, the annual average of 134 patients undergoing KTx from 2017 to 2020 was considered, the 53.5% prevalence of limited HL in kidney transplant recipients[10], study power of 80%, acceptable error of 5%, confidence level of 95% and additional loss of 10%. The minimum non-probability sample was estimated at 113 participants.

Patients with CKD who underwent KTx between 2017 and 2020, aged 18 or over, who agreed to participate in the study by signing the Informed Consent Form (ICF) were included. Patients with reports of psychiatric disorders recorded in the medical record and those with cognitive deficits were excluded. Cognitive impairment may be a confounding factor in performance on the Brief Test of Functional Health Literacy in Adults (B-TOFHLA)[11,12]. Thus, this change was verified before the interviews through the application of the Mini-Mental State Examination (MMSE) adapted for application in the hospital environment[13].

Data collection procedures

Data were collected from November to December 2021 through face-to-face interviews in a private location, using a structured questionnaire, after prior contact with the institution's directors for authorization and development of the research. Eligible patients were recruited in the waiting room, where the research objectives were clarified, and consent was requested by signing the ICF. The interviews were carried out before or after medical consultations by a nurse student with a professional master's degree in teaching and professional experience in a renal replacement therapy unit.

Study variables

The study's independent variables were sociodemographic, occupational, lifestyle, clinical and laboratory characteristics.

The sociodemographic and occupational characteristics included in the study were gender, age group, education, color/ethnicity, marital status, monthly family income, internet access at home, occupational status, working hours per day and working days per week. The lifestyle habits assessed were smoking, alcohol and cigarette consumption (regardless of the type of cigarette/drink, frequency and quantity consumed), religious beliefs and leisure-time physical activity (regardless of frequency, intensity and duration).

Clinical characteristics included the presence of comorbidities, body mass index (BMI) and duration of dialysis treatment. BMI was calculated by dividing weight (in kg) by height squared (in meters), self-reported and classified according to the cutoff points recommended by the World Health Organization (WHO): low weight(< 18,5 kg/m^2), eutrophic (18,5 to 24,9 kg/m^2), overweight (≥ 25 a 29,9 kg/m^2), grade I obesity (30,0 a 34,9 kg/m^2), grade II obesity (35,0 a 39,9 kg/m^2) and grade III obesity

($\geq$ 40,0 kg/m^2)[14]. The BMI variable was dichotomized into average weight (eutrophic) and altered weight (underweight, overweight and obesity grades I, II and III).

The laboratory tests analyzed were: hemoglobin (reference: 11 to 12 g/dL)[15], hematocrit (reference: 33 to 36%)[15], urea (reference: 10 to 45 mg/dL)[16], creatinine (reference: men 0.8 to 1.3 mg/dL and women 0.6 to 1.0 mg/dL)[17], sodium (reference: 137 to 145 mEq/L)[16], potassium (reference: 3.6 to 5 mEq/L)[16] and blood glucose (reference: 75 to 110 mg/dL)[16]. The results of the laboratory tests were collected from the patient's records, and their performance (collection and processing) was part of the routine care at the local study institution. All laboratory parameters were dichotomized into normal and altered (low and high).

The outcome variable of the study was the level of HL measured by B-TOFHLA, a translated and validated version for use in the Brazilian population[18]. The B-TOFHLA assesses two dimensions: reading comprehension (36 items) and numeracy skills (four items). The score is up to 72 points for reading comprehension (two points for each correct question) and 28 points for numeracy (seven points for each correct question), totaling 100 points in the total score. HL levels are classified as inadequate (0 to 53 points), marginal (54 to 66 points) and adequate (67 and 100 points)[18]. HL levels were dichotomized into adequate – the lowest exposure category and reference in the analysis – and limited (marginal and inadequate) – the most exposed group.

Data analysis procedures

The data were entered into a spreadsheet using the Microsoft Excel® program and subsequently exported to a database compatible with the Software for Statistics and Data Science (Stata®) in which they were analyzed. Firstly, to characterize the sample, the following were estimated: a) absolute and relative frequencies for the categorical variables; b) measures of central tendency and dispersion for continuous variables; c) prevalence of HL, general and stratified according to independent variables.

In the bivariate analysis, polytomous variables and those originally continuous were dichotomized. Pearson's chi-square or Fisher's exact tests were used to test associations between the dependent variable (HL) and independent variables. In the multivariate analysis, considering that limited LS is a highly prevalent outcome in the studied sample (> 10%), Poisson regression was conducted with robust variance with estimated prevalence ratios (PR) as a measure of effect and respective confidence intervals. 95% (95%CI). The backward procedure was used in this analysis and variables that obtained $p \leq 0.25$ in the bivariate analysis were jointly inserted into the modeling[19]. The variables with a statistical significance level of 5% remained in the final model. The accuracy of the models was verified by analyzing the Akaike information criterion (AIC), and the final model with the lowest value of this index was selected. The diagnosis of multicollinearity was carried out by evaluating the variance inflation factor (VIF) (appropriate: individual and average < 10).

Ethical and legal aspects

In compliance with Resolution No. 466 of December 12, 2012, of the National Health Council of Brazil (Conselho Nacional de Saúde do Brasil-CNS), As this is research involving human beings, the study was assessed and approved by the Research Ethics Committees of the Federal University of Goiás (protocol no. 4,969,847) and the Hospital Estadual Geral de Goiânia Dr. Alberto Rassi (protocol no. 5,059,816).

RESULTS

129 patients undergoing KTx participated in the study. The mean B-TOFHLA score was 74.88 (± 21.22; Min = 6, Max = 100). The average reading comprehension score was 54.37 (± 17.17; Min = 6, Max = 72); in numeracy, it was 20.51 (± 7.98; Min = 0, Max = 28). It was identified that 65.9% of patients had adequate HL, 15.5% were classified as borderline HL and 18.6% as inadequate HL. Therefore, the prevalence of limited HL was 34.1% (data not presented in Tables).

Among the sociodemographic characteristics, men were predominant (n = 76; 58.9%), aged between 30 and 59 years (97; 75.8%) – median of 46.5 years (± 12.44; Min = 18, Max = 70), elementary education (59; 46.1%), black (94; 72.9%), with a partner (80; 62%), monthly family income greater than two minimum wages (MW) (63; 48.8%), median of R$ 2,450.00 (± 4,146.46; Min = 1,000.00, Max = 40,000.00) and have internet access at home (89.1%). Related to occupational characteristics, there was a higher proportion of non-workers (90; 69.8%) (Table 1), among whom retirees (50; 38.8%) and unemployed (40; 31%) predominated (data not presented in Tables). Among those who worked, working hours greater than 6 hours per day (23; 65.7%) and up to 5 days per week (25; 67.6%) prevailed (Table 1).

Table 1. Distribution of patients undergoing KTx, according to sociodemographic and occupational characteristics, Goiânia, GO, 2021 (n = 129).

Variables	n	%
Sociodemographic characteristics		
Gender		
Female	53	41,1
Male	76	58,9
Age group (n = 128), years		
≤ 29	14	10,9
30 to 59	97	75,8
60 or over	17	13,3
Education (n = 128)		
Elementary School	59	46,1
High school	50	39,1
University education	19	14,8
Color/ethnicity		
Not black	35	27,1
Black	94	72,9
Marital status		
Without a partner	49	38,0
With partner	80	62,0
Monthly family income (n = 126), MW		
< 1	22	17,1
1 to 2	41	31,8
> 2	63	48,8
Internet access at home		
Yes	115	89,1
No	14	10,9
Occupational characteristics		
Occupational status		
Working	39	30,2
Not working	90	69,8
Working hours per day (n = 35)		
≤ 6	12	34,3
> 6	23	65,7
Working days per week (n = 37)		
Up to 5	25	67,6
6 to 7	12	32,4

Source: Elaborated by the authors.

Regarding lifestyle habits, there was a predominance of non-smokers (106; 96.4%), non-drinkers (95; 93.1%), people with religious beliefs (120; 93%) and those who practiced physical activity during leisure time (85; 65.9%). Regarding clinical characteristics, there was a higher percentage of patients with comorbidities (114; 88.4%), normal body weight (65; 50.4%) and dialysis treatment time of 1 to 5 years (75; 58.1%). It was evident that the majority of patients presented changes in hemoglobin (110; 88.7%), hematocrit (109; 88.6%) and creatinine (77; 69.4%) levels (Table 2).

In the bivariate analysis, among the sociodemographic and occupational characteristics, there was an association of limited HL with low education (p = 0.012), lower monthly family income (p = 0.008), lack of internet access at home with a borderline association (p = 0.054) and occupational status (p = 0.011). Having primary education (PR = 1.85; 95%CI 1.13-3.06), monthly family income of less than two MW (PR = 2.00; 95%CI 1.17-3.43), not having access to the internet at home (PR = 1.83; 95%CI 1.07-3.10) and not working (PR = 2.29; 95%CI 1.12-4.68) promoted an increase in the prevalence of limited HL of 85%, twice, 83% and more than twice, respectively (Table 3).

Table 2. Distribution of patients undergoing KTx, according to lifestyle habits and clinical characteristics, Goiânia, GO, 2021 (n = 129).

Variables	n	%
Life habits		
Smoking(n = 110)		
No	106	96,4
Yes	4	3,6
Alcohol consumption (n = 102)		
No	95	93,1
Yes	7	6,9
Religious belief		
Yes	120	93,0
No	9	7,0
Leisure-time physical activity		
Yes	85	65,9
No	44	34,1
Clinical features		
Comorbidities		
No	15	11,6
Yes	114	88,4
IMS (n = 128)		
Normal weight	65	50,4
Low weight	3	2,3
Overweight	60	46,5
Dialysis treatment time, years		
≤ 1	11	8,5
1 to 5	75	58,1
> 5	35	7,1
Hemoglobin (n = 124)		
Normal	14	11,3
Amended	110	88,7
Hematocrit(n = 123)		
Normal	14	11,4
Amended	109	88,6
Urea (n = 124)		
Normal	78	60,5
Amended	46	35,7
Creatinine(n = 111)		
Normal	34	30,6
Amended	77	69,4
Sodium (n = 120)		
Normal	95	79,2
Amended	25	20,8
Potassium (n = 121)		
Normal	99	81,8
Amended	22	18,2
Glycemia (n = 123)		
Normal	73	59,3
Low	9	7,3
High	71	33,3

Source: Elaborated by the authors.

Table 3. Estimates of limited HL in patients undergoing KTx, according to sociodemographic and occupational characteristics, Goiânia, GO, 2021 (n = 129).

Variables	n	Prevalence(%)	*p*-value*	PR	IC95%
Sociodemographic characteristics					
Gender					
Female	18	34,0	0,977	1,00	-
Male	26	34,2		1,01	0,62-1,64
Age group (n = 128), years					
Up to 45	17	27,0	0,083	1,00	-
46 or more	27	41,5		1,54	0,94-2,53
Education (n = 128)					
Elementary School	27	24,6	**0,012**	1,85	1,13-3,06
Secondary/higher education	17	45,8		1,00	-
Color/ethnicity					
Not black	14	40,0	0,389	1,00	-
Black	30	31,9		0,80	0,48-1,32
Marital status					
Without a partner	16	32,7	0,785	1,00	-
With partner	28	35,0		1,07	0,65 -1,77
Monthly family income (n = 126), MW					
≤ 2	28	44,4	**0,008**	2,00	1,17-3,43
> 2	14	22,2		1,00	-
Internet access at home					
Yes	36	31,3	0,054	1,00	-
No	8	57,1		1,83	1,07-3,10
Occupational characteristics					
Occupational status					
Working	7	17,9	**0,011**	1,00	-
Not working	37	41,1		2,29	1,12-4,68
Working hours per day (n = 35)					
≤ 6	2	16,7	0,957	1,00	-
> 6	4	17,4		1,04	0,22-5,01
Working days per week (n = 37)					
Up to 5	2	16,0	0,959	1,00	-
6 to 7	4	16,7		1,04	0,22-5,02

Source: Elaborated by the authors. **p*-value obtained by Pearson's chi-square test or Fisher's exact test.

There was no statistically significant association between limited HL and the lifestyle habits and clinical characteristics evaluated (Table 4).

In multivariate modeling, the variables age group ($p = 0.240$), monthly family income ($p = 0.119$), internet access at home ($p = 0.817$), sodium levels ($p = 0.667$) and potassium ($p = 0.763$), alcohol consumption (p = 0.226) and comorbidities ($p = 0.248$) did not obtain a statistically significant association. Its gradual exclusion, considering the order from the highest to the lowest *p*-value, was endorsed by the decrease in the AIC value. The smoking variable was not included in the multivariate model as it did not present any positive cases of limited HL. The analysis of individual and average VIF ruled out the hypothesis of multicollinearity in the saturated and reduced model (data not presented in Tables).

Having primary education (PR: 1.72; 95%CI 1.04-2.83) and not working (Pr: 2.14; 95%CI 1.05-4.35) remained associated with limited HL. These two variables increased the prevalence of limited HL by 72% and more than twice, respectively (Table 5).

Table 4. Estimates of limited HL in patients undergoing KTx, according to lifestyle habits and clinical characteristics, Goiânia, GO, 2021 (n = 129).

Variables	n	Prevalence(%)	*p*-value*	PR	IC95%
Life habits					
Smoking (n = 110)					
No	39	36,8	0,131	1,00	-
Yes	-	-		-	-
Alcohol consumption (n = 102)					
No	37	38,9	0,193	1,00	-
Yes	1	14,3		0,37	0,06-2,31
Religious belief					
Yes	41	34,2	0,959	1,00	-
Noo	3	33,3		0,98	0,37-2,55
Leisure-time physical activity					
Yes	29	34,1	0,998	1,00	-
No	15	34,1		1,00	0,60-1,66
Health situation					
Comorbidities					
No	2	13,3	0,086	1,00	-
Yes	42	36,8		2,76	0,74-10,27
IMS (n = 128)					
Normal	22	33,8	0,898	1,00	-
Amended	22	34,9		1,03	0,64-1,67
Dialysis treatment time, years					
≤ 1	5	45,5	0,471	1,00	-
1 or more	38	34,5		1,32	0,65-2,65
Hemoglobin (n = 124)					
Normal	3	21,4	0,296	1,00	-
Amended	39	35,5		1,65	0,59-4,67
Hematocrit(n = 123)					
Normal	5	35,7	0,841	1,00	-
Amended	36	33,0		0,92	0,43-1,97
Urea (n = 124)					
Normal	28	35,9	0,535	1,00	-
Amended	14	30,4		0,85	0,50-1,44
Creatinine (n = 111)					
Normal	11	32,4	0,683	1,00	-
Amended	28	36,4		1,12	0,63-1,99
Sodium (n = 120)					
Normal	30	31,6	0,244	1,00	-
Amended	11	44,0		1,39	0,82-2,38
Potassium (n = 121)					
Normal	31	31,3	0,205	1,00	-
Amended	10	45,5		1,45	0,84-2,50
Glycemia (n = 123)					
Normal	26	35,6	0,516	1,00	-
Amended	15	30,0		0,84	0,50-1,43

Source: Elaborated by the authors. **p*-value obtained by Pearson's chi-square test or Fisher's exact test.

Table 5. Prevalence ratio and 95%CI of factors associated with HL concerning level of education and occupational factor in patients undergoing KTx, Goiânia, GO, 2021.

Variables	PR	IC 95%
Education		
Elementary School	1,72	1,04-2,83
Secondary/higher education	1,00	-
Occupational status		
Working	1,00	-
Non-working	2,14	1,05-4,35
AIC	1,41	
Average VIF	1,63	

Source: Elaborated by the authors.

DISCUSSION

This study showed a moderate prevalence of limited HL among patients undergoing KTx, below that observed in other studies[10,20-22]. According to the multivariate analysis, limited HL was associated with low education and not working. Brazilian studies also identified high levels of limited HL in this population and similar populations, such as 53.5% in transplant patients[10], 80.9% in patients on dialysis therapy[20], 68[21] and 100%[22] in patients undergoing pre-dialysis treatment.

Comparing prevalence estimates, lower rates of limited HL are observed in transplant patients than in those undergoing dialysis or pre-dialysis treatment. This finding may be due to the longer exposure time to health education actions about CKD and its treatment[23]. If they consider undergoing KTx, patients can seek to become better informed about the risks and benefits of this type of treatment and changes in CKD therapy and post-transplant lifestyle habits. This can have a significant impact on patients' HL.

There was a higher prevalence of limited HL in patients undergoing KTx with a lower level of education (elementary school), with a statistically significant association. Studies carried out with a similar population[24,25] corroborated this finding. Patients with low education may be less likely to know about CKD and KTx[25]. They may also need help understanding this information, which can impact knowledge acquisition and, consequently, limited HL. It is recommended that studies be carried out that evaluate, in addition to the level of formal education, the individual's actual learning, as the transplant patient may have mastered writing, reading and numeracy skills and cannot use them daily to understand a medical prescription, medication leaflet and educational materials[26,27]. It is essential to use specific instruments to measure the level of knowledge of patients with CKD about the disease and treatment[28], as well as the development of studies that advance the dimensional validation processes of these scales.

It is worth mentioning that the B-TOFHLA is an instrument that measures HL by evaluating the dimensions of reading and numeracy. Therefore, as these skills require some educational instruction for good performance, the relationship between low education and the higher prevalence of limited HL in patients undergoing KTx is justified[22]. Complementary approaches to B-TOFHLA are also recommended, such as Newest Vital Sign (NVS)[29,30] adapted for use in patients undergoing KTx, which assesses the individual's ability to understand and interpret the contents of two specific medical prescriptions for kidney transplant recipients. However, the NVS still needs to be validated for use in the Brazilian population[31], which requires efforts from researchers to evaluate its psychometric performance and dimensional structure.

The results of this study also revealed the association between limited HL and not working. Comparison of this finding with published literature took a lot of work because the occupational situation needs a standardized investigation. Studies on HL in KTx usually categorize this variable into workers, unemployed, retired, students and other occupations. Therefore, it is impossible to compare the effect of working or not working on HL since this analysis highlights the impact of work and non-work on HL and not specific categories of non-workers. It is worth noting that, among the occupations of the participants in this study, there was a higher proportion of retirees (50; 38.8%) and unemployed (40; 31%); instead, it is recommended to conduct studies with samples that make it possible to analyze HL estimates and associated factors in these strata.

Work is highly relevant to the social construction of human identity and subjectivity. Furthermore, it can be a source of satisfaction, pleasure and human development[32]. It is a structuring dimension in people's lives. It has a close relationship with their health situation, especially with mental illness, as not only a bad job can generate suffering but also the absence of work[33]. Thus, it is inferred that people who do not work may not have positive reinforcements from work, such as the stimulus to acquire new knowledge and skills, in addition to the risk of developing mental suffering.[34]. These factors together can be evoked to understand the higher prevalence of limited HL in non-workers, a relationship that needs to be better explored longitudinally.

The study has limitations related to the cross-sectional study design, which does not allow for establishing a relationship between cause and effect. It is recommended to conduct longitudinal studies, with the adoption of probabilistic sampling and large samples, for a more accurate investigation of the factors associated with limited HL in patients with CKD since the initial cycle of the disease, with follow-up evaluation in the pre-treatment stages, dialysis and post-KTx. It is also important to point out that non-probabilistic sampling was established, making it impossible to generalize the results. However, the sample calculation was established considering the prevalence of limited HL in the population of interest and study power of 80% to ensure that the size of the sample analyzed would enable the identification of the intended associations.

CONCLUSION

Compared to findings from other studies, limited HL was moderately prevalent among patients undergoing KTx. Limited HL was associated with a low education level and not working.

Health services must implement programs with strategies to improve HL and continuously provide health education related to CKD, KTx and its other therapies. Considering the results of this study, the planning of these actions must prioritize the particularities of patients with greater socioeconomic vulnerability, such as those with a low level of education and non-workers.

CONFLICTS OF INTEREST

Nothing to declare.

AUTHOR'S CONTRIBUTION

Substantive scientific and intellectual contributions to the study: Montelo MPM, Teixeira JRB, Martins KA, Pereira ERS; **Conception and design:** Montelo MPM, Teixeira JRB, Martins KA, Pereira ERS; **Data analysis and interpretation:** Montelo MPM, Teixeira JRB, Martins KA, Pereira ERS; **Article writing:** Montelo MPM; **Critical revision:** Montelo MPM, Teixeira JRB, Martins KA, Pereira ERS; **Final approval:** Pereira ERS.

DATA AVAILABILITY STATEMENT

All dataset were generated or analyzed in the current study.

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