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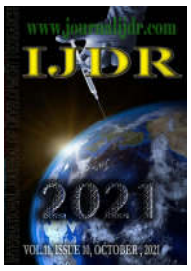

RESEARCH ARTICLE OPEN ACCESS

LEVEL OF KNOWLEDGE ABOUT SELF-CARE WITH AVF IN FREQUENT CHRONIC KIDNEY PATIENTS IN A HEMODIALYSIS CLINIC IN SOUTHWESTERN GOIANO

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ABSTRACT

Chronic kidney disease (CKD) has high rates of incidence and prevalence and is defined as changes in glomerular filtration rate and/or presence of parenchymal damage maintained for at least three months. When in an advanced stage, renal replacement therapies (RRT) are essential for the maintenance of the patient's life and the arteriovenous fistula (AVF) is considered the best vascular access for this. Thus, self-care is part of the human ability to take care of oneself and, with regard to the AVF, it aims to preserve the integrity and proper functioning. The data collected showed that 63% of the patients studied had an adequate result in terms of knowledge about self-care with the AVF. The best performances were observed in terms of hygiene, contraindicated hospital procedures, identification of functioning, and restrictions on necessary activities of daily living. On the other hand, the worst performances were: pre-access care, identification of changes related to the AVF, and identification of signs of infection. The study was relevant because it highlighted the importance of multidisciplinary work in the health education process of patients undergoing hemodialysis.

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INTRODUCTION

Chronic Kidney Disease (CKD) has high incidence and prevalence rates, being configured as a global public health problem, with poor prognosis and high costs for public and private services (Silva, 2018). Currently, the definition based on changes in the glomerular filtration rate and/or the presence of parenchymal damage maintained for at least three months is widely accepted. In its most advanced stage, renal replacement therapies (RRT) are necessary to maintain the patient's life (Xavier, 2018).

Hemodialysis, the most used RRT in CKD, consists of extracorporeal blood filtration and clearance of toxic substances such as urea and creatinine (Takemoto, 2011). This treatment is performed via vascular access, and the arteriovenous fistula (AVF) is one of the access modalities, considering the four existing ones: double-lumen catheter, shunt, AVF, and poly-tetra-fluor-ethylene (PTFE) (Moreira, 2017). The AVF is permanent access, which surgically joins the artery to a vein, which promotes the dilation of the vascular lumen and allows for repeated punctures (Moreira, 2017). This type of access was the initial step for the chronic use of hemodialysis, which until then was indicated for acute cases and was limited to a few sessions, given the

difficulty imposed by repeated manipulations and rapid venous exhaustion (Sousa, 2012). In this sense, the creation of the AVF depends, among many factors, on the integrity and good condition of the venous and arterial network of the chronic renal patient, especially with sufficient size and elasticity to allow for dilatation and maturation after the operation. In addition, it is important to emphasize that the preservation of vascular access is of great importance in the treatment of chronic renal patients, particularly those in the terminal state, since during the evolution of the injury they are subjected to various vascular damages, such as accessing peripherals and centrals, blood samples and drug administration (Sousa, 2018). Furthermore, the AVF is the most suitable access in hemodialysis as it has a long useful life that enables effective dialysis with fewer interventions. Furthermore, it is associated with fewer complications, lower morbidity, lower maintenance cost, and lower mortality compared to other vascular accesses (Sousa, 2017; Pessoa , 2015; Neves Junior, 2011). However, although considered the best access technique for hemodialysis, fistula is susceptible to complications such as thrombosis, aneurysms, infections, cardiac overload, and low blood flow. Thus, to prevent such complications, it is necessary to provide adequate care, which involves both the health team and the patient and their family and social support network (Pessoa, 2015). Self-care is part of the human ability to take care of oneself, and about the AVF, it aims to preserve the integrity and proper functioning. Therefore, it is essential that there is effective communication between the health team and the patient, so that the patient is encouraged and guided about the attitudes to be employed (Moreira, 2017). The optimization of the AVF is a challenge for the interdisciplinary health team, and patient education is an essential element in its maintenance (Sousa 2017). Given the possible complications associated with inadequate arteriovenous fistula management, this study aimed to assess the level of knowledge about self-care with fistula in patients attending the Nephrology Clinic of Rio Verde, Goiás.

METHODS

Study Design: This is a descriptive, prospective, cross-sectional, and quantitative study to be carried out with patients with chronic kidney disease attending a nephrology and dialysis clinic in southwest Goiás, who use the Unified Health System.

Interventions: Data collection was done through a questionnaire, consisting of 2 parts: the first part aimed at the sociodemographic characterization, and the second part related to the patient's self-care practices with the AVF. The collections took place between October 2020 and March 2021. Data were registered in an electronic spreadsheet.

Eligibility Criteria: For sample selection, inclusion criteria were used such as being over 18 years of age, undergoing hemodialysis treatment at the nephrology clinic of Rio Verde for more than 6 months, having an AVF, being available to answer the interview, and signing the consent form. free and clear. Exclusion criteria were patients without adequate communication and cognition capacity to answer the questionnaires, such information being requested from the local health team and not answering the questionnaires completely.

Statistical Analysis: Data were analyzed using a binomial logistic regression, using the patients' gender, age, income, and education as predictor variables. A tolerance analysis was performed to test multicollinearity, while accuracy, prediction percentage, and McFadden's pseudo-R^2 were used to assess the model's fit. A tolerance above 0.80 was considered necessary to indicate the absence of multicollinearity, in addition to an accuracy greater than 50% with a percentage of correct answers balanced between the two categories as necessary to produce a robust model. Analyzes were performed using the Jamovi 1.6.16 statistical software, assuming a significance level of 0.05 as necessary to indicate a statistically significant difference.

Ethical Aspects: This study followed all the ethical procedures proposed by the resolution of the national health council nº 466, of December 12, 2012 (BRAZIL, 2013). The research was approved by the Research Ethics Committee – CEP of UNIRV with Opinion number: 3.834.213 on February 12, 2020, and CAAE: 26765319.0.0000.5077.

RESULTS

The results of 155 questionnaires answered by the patients who participated in the research were evaluated, being 45% female (F) and 55% male (M), with a mean age of 52.20 ± 14.10. As for education, 44% of patients had incomplete primary education (IPE), 20% complete primary education (CPE), 11% complete secondary education (CSE), and 11% complete higher education (CHE), while in terms of income, 32% had an income less than or equal to 1 minimum wage (<=1), 34% between 1 and 2 minimum wages (1 to 2) and 34% had an income greater than 2 minimum wages (>2). The results of the questionnaire regarding the care of the arteriovenous fistula by the patients were classified as “Adequate” or “Inappropriate”. Table 1 presents the absolute frequency and relative percentage of categorized responses for the 14 questions that comprised the questionnaire, while Table 2 presents the same absolute frequency and percentage for the results evaluated by the questionnaire, with the "Maturation" group referring to the first two questions of the questionnaire, the “General” group referring to the other questions and the “Final” group referring to the evaluation of the questionnaire considering all questions. Given the research results, in Table 1, it was evident that the worst performances related to knowledge about self-care with the AVF were pre-accomplishment care of the AVF (85%), identification of changes in the AVF (79%), alteration of AVF temperature (76%) and identification of signs of infection (59%). The best performances regarding self-care with the AVF were pre-hemodialysis hygiene (96%), hospital procedures contraindicated in the AVF member (94%), functional identification (93%), daily activities to be avoided (93%), and conduct when bleeding from the puncture site (85%). Table 3 presents the results of the statistical analysis for the variable Care 1st week. McFadden's Pseudo-R^2 was equal to 0.11, while a tolerance greater than 0.90 was found for all predictor variables. The model presented an accuracy of 67%, with 51% in the prediction of the “Inadequate” category and 78% for “Adequate”. The results indicate that the model is suitable for classification in both categories.

The logistic regression results indicate that income did not have a significant influence. As for age, the increase of 1 year led to a decrease in the chance of the patient belonging to the "Adequate" group, while female patients have a 2.09 times (109%) increase in the chance of belonging to the "Adequate" group to male patients. As for education, patients with CME have a 3.72-fold increase (272%) in the chance of belonging to the “Adequate” group to patients with IPE, whereas patients with CME have a 4.13-fold increase (313%) in the chance of belonging to the “Adequate” group to patients with CPE. No influence was found for comparisons between other levels of education. Table 4 presents the results of the statistical analysis for the variable Maturation. McFadden's Pseudo-R^2 was equal to 0.11, while a tolerance greater than 0.90 was found for all predictor variables. The model presented an accuracy of 66%, with 44% in the prediction of the “Inappropriate” category and 80% for “Adequate”. The results indicate that the model is suitable for classification in both categories. Logistic regression results indicate that patients' income and gender did not have a significant influence. Age, on the other hand, showed that an increase of 1 year leads to a decrease in the chance of the patient belonging to the “Adequate” group, while patients with CME have a 4.26-fold increase (326%) in the chance of belonging to the "Adequate" group in relation to IPE patients, whereas CME patients have a 5.01 times (401%) increase in the chance of belonging to the "Adequate" group in relation to CPE

Table 1. Absolute frequency and percentage of the number of patients classified as 'Adequate' or 'Inadequate' according to the evaluated criteria

	AbsoluteFrequency		Percentage (%)	
Criteria	Adequate	Inadequate	Adequate	Inadequate
Pre AVF care	24	131	15%	85%
1st-week care	96	59	62%	38%
Operation	144	11	93%	7%
Frequency-operation	107	48	69%	31%
Pre-hemodialysis-Hygiene	149	6	96%	4%
SignsofInfection	64	91	41%	59%
FAV Changes	32	123	21%	79%
Bruise	88	67	57%	43%
Temperature	37	118	24%	76%
Procedure	145	10	94%	6%
Whattoavoid?	144	11	93%	7%
Fistula withoutthrill	115	40	74%	26%
bleeding	131	24	85%	15%
hypotension	120	35	77%	23%

Table 2. Absolute frequency and percentage of the number of patients classified as 'Adequate' or 'Inadequate' according to the questionnaire assessment

	AbsoluteFrequency		Percentage (%)	
	Adequate	Inadequate	Adequate	Inadequate
Maturation	98	57	63%	37%
General	145	10	94%	6%
Final	97	58	63%	37%

Table 3. Results of the binomial logistic regression for the dependent variable Care 1st without, adopting the category "Inappropriate" as a reference. In the column "Variables" the reference group for categorical variables is shown on the right. EP: Standard error; Z: Result of Wald statistic; 95% CI: Confidence Interval 95% of the OddsRatio (OR)

	Coefficients	EP	Z	OR	CI 95%	p-value
Age (years)	-0.03	0.01	-2.05	0.97	0.94 – 0.99	< 0.05
Gender						
Female – Male	0.73	0.36	1.99	2.09	1.01 – 4.32	< 0.05
Education						
CPE** – IPE*	-0.10	0.46	-0.22	0.90	0.36 – 2.23	0.82
CSE*** – IPE	1.31	0.54	2.41	3.72	1.28 – 10.85	< 0.05
CHE****– IPE	-0.03	0.62	-0.05	0.96	0.28 – 3.26	0.95
CSE – CPE	1.14	0.60	2.36	4.13	1.27 – 13.40	< 0.05
CHE – CPE	0.06	0.65	0.10	1.06	0.29 – 3.89	0.91
CHE – CSE	-1.35	0.69	-1.94	0.25	0.06 – 1.00	0.05
Income (finance)						
>2 – <=1	0.14	0.46	0.31	1.15	0.46 – 2.88	0.75
1 a 2 – <=1	0.26	0.44	0.59	1.30	0.54 – 3.12	0.55
>2 – 1 a 2	-0.11	0.44	-0.26	0.88	0.37 – 2.12	0.78

*incomplete primary education (IPE); **complete primary education (CPE); ***complete secondary education (CSE); ****complete higher education (CHE)

Table 4. Results of the binomial logistic regression for the dependent variable Maturation, adopting the category "Inappropriate" as a reference. In the column "Variables" the reference group for categorical variables is shown on the right. EP: Standard error; Z: Result of Wald statistic; 95% CI: Confidence Interval 95% of the Odds Ratio (OR)

	Coefficients	EP	Z	OR	CI 95%	p-value
Age	-0.03	0.01	-2.07	0.96	0.94 – 0.99	< 0.05
Gender						
Female – Male	0.63	0.37	1.71	1.89	0.91 – 3.92	0.08
Education						
CPE – IPE	-0.16	0.46	-0.35	0.85	0.34 – 2.10	0.72
CSE – IPE	1.45	0.57	2.53	4.26	1.39 – 13.08	< 0.05
CHE– IPE	-0.11	0.62	-0.18	0.89	0.26 – 3.01	0.85
CSE – CPE	1.61	0.62	2.58	5.01	1.47 – 17.05	< 0.05
CHE – CPE	0.04	0.65	0.07	1.05	0.29 – 3.80	0.94
CSE – CHE	1.56	0.71	2.18	4.77	1.17 – 19.40	< 0.05
Income (finance)						
>2 – <=1	0.15	0.46	0.32	1.16	0.46 – 2.92	0.74
1 a 2 – <=1	0.18	0.44	0.41	1.20	0.50 – 2.89	0.67
>2 – 1 a 2	-0.03	0.44	-0.07	0.83	0.34 – 1.99	0.83

Table 5. Results of the binomial logistic regression for the Final dependent variable, adopting the category "Inappropriate" as a reference. In the column "Variables" the reference group for categorical variables is shown on the right. EP: Standard error; Z: Result of Wald statistic; 95% CI: 95% Confidence Interval of the Odds Ratio (OR)

	Coefficients	EP	Z	OR	CI 95%	p-value
Age	0,02	0,01	1,94	1,03	0,99 – 1,06	0,05
Gender						
Female – Male	-0,69	0,37	-1,87	0,497	0,23 – 1,03	0,06
Education						
CPE – IPE	0,08	0,46	0,19	1,09	0,44 – 2,70	0,84
CSE – IPE	1,55	0,57	2,71	4,74	1,54 – 14,57	< 0,05
CHE– IPE	-0,02	0,62	-0,03	0,97	0,28 – 3,30	0,97
CSE – CPE	1,64	0,62	2,62	5,17	1,51 – 17,66	< 0,05
CHE – CPE	-0,11	0,65	-0,16	0,86	0,24 – 3,25	0,86
CSE – CHE	1,53	0,71	2,14	4,64	1,14 – 18,82	< 0,05
Income (finance)						
>2 – <=1	-0,02	0,46	-0,04	0,97	0,38 – 2,45	0,96
1 a 2 – <=1	-0,16	0,44	-0,37	0,84	0,35 – 2,03	0,70
>2 – 1 a 2	0,14	0,44	0,32	1,15	0,48 – 2,78	0,70

model presented an accuracy of 69%, with 53% in the prediction of the "Inappropriate" category and 78% for "Adequate". The results indicate that the model is suitable for classification in both categories. The logistic regression results indicate that the age, income, and gender of patients did not have a significant influence. Income, on the other hand, shows that patients with CME have a 4.74 times greater chance (374%) of belonging to the "Adequate" group compared to people with IPE, a 5.17 times greater chance (417%) in relation to people with CPE and 4.64 times higher (364%) in relation to people with CHE. Finally, the results of the absolute frequency acquired with the assessment of the questionnaire indicate that 63% of the patients undergoing the study have adequate knowledge about self-care with the AVF. When dismembered, the knowledge of self-care during the maturation period, 63% of the patients showed a favorable result, and during the period of use of the AVF as vascular access, the result was 94%.

DISCUSSION

It was identified in this study that 55% of the patients submitted to the survey were male, despite the fact that CKD affects, indiscriminately, men and women. This data coincides with the results of the census carried out by the Brazilian Society of Nephrology in the period between 2009-2018, which shows the percentage of patients being treated for RRT by hemodialysis in Brazil, of which 58% were male (Neves, 2020). Regarding the level of education, it was evident that most of the research subjects had incomplete elementary education (44%). A survey in Recife-Pernambuco also showed the predominance of incomplete primary education (Clementino, 2018). As for family income, 32% have an income of up to 1 minimum wage, 34% have an income between 1 and 2 minimum wages and 34% have an income above 2 minimum wages. A study previously carried out in Imperatriz (Maranhão) also showed that most patients/patients receive between 1 and 2 minimum wages (Bezerra, 2012). Given the negative results in relation to self-care with the AVF, the great risk generated by the lack of guidance for these patients is perceived, and that the lack of adequate care with access can lead to numerous complications that imply loss of access and the need for preparation of a new one, use of antimicrobials, low blood flow, thrombosis, aneurysms, edema, ischemia, cardiac overload, not undergoing hemodialysis and, consequently, clinical worsening of the patient, and the basis for minimizing these facts is health education and patients well-oriented about their own care (Santos, 2010). During treatment, the patient needs to maintain basic care such as daily checking the functioning of the access through palpation and perception of the thrill, observing signs and symptoms of infection, performing hygiene, not allowing venous manipulation by other professionals for medication administration; check blood pressure in the fistula arm, avoid compression and strain on the access limb (Moreira, 2017).

Extremely important care for maintaining healthy access is to perform adequate antisepsis of the arm before dialysis sessions, given the risk of infections in the access and consequent hospitalizations. Furthermore, it is essential that after HD, the patient performs adequate compression aiming at correct hemostasis after punctures, in order to avoid hematomas and/or bleeding (Pessoa, 2015; Clementino, 2018). It was found in previous studies carried out in Recife-CE and Fortaleza-CE that 100% and 38% of patients, respectively, are aware of the importance of adequate asepsis of the AVF limb before the hemodialysis session (Clementino, 2018; Furtado, 2006). Thus, it is observed that the patients in this research have a good level of knowledge of this care.Knowledge about the contraindication of procedures in the fistula limb is essential to avoid damage such as reduced blood flow followed by thrombosis in the venous bed, formation of hematomas, and injury to the venous network (Santana, 2019). In this context, previous studies showed that 96.9% of patients in a hemodialysis clinic in northeastern Brazil had adequate knowledge regarding hospital procedures to be avoided in the limb with venous access (Clementino, 2018). The result was similar in the nephrology clinic in Rio Verde, showing a good level of knowledge about this care.As part of self-care, it is necessary to avoid, in the access limb, the performance of great physical efforts, sleeping on the arm, and trauma, in order not to interrupt the blood flow in the region, avoiding hematomas and thrombosis of the AVF. It is also important to guide patients to check daily for the presence of thrill and pulse over the fistula and, if they are absent, the health service must be notified in order to carry out interventions to ensure its durability (Santana, 2019; Nogueira, 2016). With regard to care related to activities of daily living, it was evidenced that 93% of patients undergoing this study have adequate knowledge about the existing limitations, which was not observed in other studies that showed 19% and 60% of results favorable(Paiva, 2008; Fermi, 2014).

Therefore, patients in this research have a good level of knowledge about this care.Furthermore, in relation to bleeding, when compared to studies from other institutions that had 96.9% of the result of adequate knowledge, the patients at the clinic in Rio Verde had an inferior performance, albeit satisfactory. Thus, in cases of AVF bleeding outside the dialysis unit, the patient is instructed to perform local compression, limb elevation and, if persistent, should immediately go to the health center of their reference (Paiva, 2008; Reinas, 2012). As for the repercussions generated by the social construction of masculinity, studies show that men do not dedicate time to self-care, referring to work activities as difficulty in attending the services. Also, men devalue preventive care and pay attention to curative practices, not recognizing or executing health prevention strategies and actions. Thus, the visit to the services was conditioned to the worsening of the situation/disease, therefore, the best self-care performance with the AVF presented by women in the first week is justified (Sousa, 2017). The level of education is a fundamental factor since the higher level of education is directly related to greater access to information and better economic conditions. On the other hand, low education can negatively interfere with learning and performing

self-care, and adherence to healthy living practices (20). Although studies indicate that the income associated with the level of education influences the level of self-care with the AVF, this study points to a dichotomy of results, as individuals with CHE are less likely to present an "Adequate" result when compared to those with CME, and patients with CME are more likely to have an "Adequate" result when compared to those with IPE and CPE. Besides, age is a factor that impairs the individual's functional independence and self-care capacity, and, as age increases, there is a decrease in functional independence and self-care capacity, in addition to the fact that greater numbers of comorbidities are related to less independence and less capacity for self-care (Bettoni, 2017).

CONCLUSION

The restrictions imposed by chronic kidney disease and renal replacement therapy, as well as the psychosocial disorders they cause are always severe and the degree of assimilation and adherence is always different from one person to another, depending on the values and experience of each individual. Therefore, family support helps in coping with the limitations that permeate kidney function failure.In this study, it was observed that most respondents have adequate knowledge about self-care with the arteriovenous fistula. Regarding the parameters of better performance of the patients, there are pre-hemodialysis hygiene, hospital procedures contraindicated in the arteriovenous fistula member, identification of functioning, daily activities to be avoided, and conduct in the face of bleeding from the puncture site (85%). The worst performances were identified in pre-arteriovenous fistula care, identification of changes in the arteriovenous fistula, change in temperature of the arteriovenous fistula, and identification of signs of infection.The study was of great relevance because it highlighted the importance of multidisciplinary work in the health education process of patients attending the clinic and the service gap in the face of self-care guidelines provided to individuals on hemodialysis.

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