

# Health Literacy and Relation to Adherence to Pharmacologic Treatment of Patients in Hemodialysis

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**Keywords—** *Health Literacy, Renal Dialysis, Medication adherence.*

**Abstract—** *Objective: to analyze the relationship between health literacy and adherence to treatment of dialysis patients. Method: cross-sectional study with 424 end-stage renal disease patients on conventional HD in the West and Middle West of Santa Catarina. The SALPHA questionnaire was used to analyze health literacy and the Brief Medication Questionnaire was used for treatment adherence. Minimental was used to analyze cognition. Results: the mean age was  $57.3 \pm 15.8$  years, 53.3% men, 71.4% with low education level, 10.1% have had a kidney transplant, 5.0% reported having already taken an extra dose of medication, 4.0% said they had missed doses and 22.6% admitted failure of days or prescribed doses. Literacy was inadequate for 67%, 49.1% were considered to have cognitive impairment, 55.2% are adhered to treatment. Low adherence to treatment was related to inadequate literacy ( $p < 0.01$ ), literacy and cognition showed a positive correlation ( $r = 0.5$ ;  $p < 0.00$ ), those who reported taking extra dose of the medication were less adherent ( $p < 0.03$ ), as well as those who omitted medication at some point ( $p < 0.02$ ). Conclusion: Inadequate literacy was related to low adherence to treatment, and also to cognitive deficit, low education, smoking and old age.*

## I. INTRODUCTION

Patients with Chronic Kidney Disease (CKD) on hemodialysis need to face a complex treatment, which involves changes in lifestyle, dietary adjustments, use of continuous medication and attendance at dialysis sessions<sup>1</sup>. For the treatment to be successful, it is essential that the patient understands the information passed on by the multidisciplinary team and has adequate adherence to the treatment<sup>2</sup>.

To have sufficient understanding of the disease and treatment, it is desirable that the patient has an adequate level of health literacy (HL), which refers to the individual's cognitive and social capacity to obtain, understand and use basic health information for a proper decision-making about your own health<sup>3</sup>.

HL is defined by the World Health Organization (WHO) as a social determinant of health<sup>4</sup> and its relevance concerns the possibility of the patient to identify risks to their health, their family and community and have the

necessary knowledge to seek help from a professional, as well as assimilate the prescribed care and apply them in their daily lives<sup>5</sup>.

As well as literacy, adherence to medication treatment is also fundamental for the success of therapy, and the high number of daily medications favors non-adherence<sup>6</sup>, which contributes to the increase in mortality associated with the disease. Treatment adherence is directly related to the parameters of disease control and care, more specifically in relation to organizational access and bonding indicators<sup>7</sup>.

## II. METHODS

Cross-sectional study, carried out with hemodialysis patients in clinics in the Midwest, West and Far West of Santa Catarina, which currently serve 481 hemodialysis patients. Inclusion criteria were being on dialysis treatment for at least one month, age over 18

years. Those who were not on dialysis on the day of data collection were excluded.

During the hemodialysis session, participants responded to four instruments. The Brief Medication Questionnaire (BMQ) for analyzing adherence to medication treatment; the Mini Mental State Examination (MMSE) for cognitive screening; the Short Assessment of Health Literacy for Portuguese-speaking Adults (SAHLPA) to analyze health literacy and a questionnaire to collect socio-demographic and health status data.

Data were analyzed using the SPSS program, using the Shapiro Wilk normality test. The association of categorical data was performed using the chi square and numerical data using the Student t test. When non-parametric data were used, Mann Whitney of independent samples was used. Pearson was used for correlation analysis and 95% confidence was adopted.

This study was approved by the Ethics and Research Committee of the Universidade do Oeste de Santa Catarina, under opinion n°. 3,600,784 and respected all ethical precepts in research, according to CNS 466/12. All participants signed the Informed Consent Form.

### III. RESULTS

A total of 424 patients participated in the study (88.1% of the total people on hemodialysis considering the three regions), 39 were excluded for not attending dialysis on the day of data collection, whether due to travel, hospitalization or absence without justification. The mean age was  $57.3 \pm 15.8$  years. Dialysis time had a median of 26 months (interquartile range 11-60), mean of 44.06 months, minimum one month and maximum 288 months.

Table 1 shows the profile of the interviewees, their self-reported health habits, medication profile and treatment adherence.

Table 1: Socio-demographic and clinical profile of patients on hemodialysis. N=424

Variables	N	%
Male	226	53,0
Female	198	47,0
Married	327	77,0
Education $\leq 8$ years	303	71,0
Have had a kidney transplant	43	10,1
Healthy diet (self referred)	214	50,5
Take care of the amount of water ingested (self-reported)	349	82,3
Take care of the amount of salt ingested (self-reported)	390	92,0
Smoker	29	6,8
Multiple Prescription Medications	345	81,4
Took an extra dose of the medication (at least once)	21	5,0
Already omitted doses of medication prescribed	17	4,0
Admitted failure of days or prescribed doses	96	22,6

Regarding adherence, 234 (55.2%) were considered adherent to the treatment and 190 (44.8%) non-adherent. Literacy was considered inadequate for 282 (66.5%) and adequate for 141 (33.3%). From the Minimental, 216 (50.9%) were considered without cognitive deficit, with a mean of MMSE  $23.2 \pm 6.1$  points.

Regarding literacy, the mean in the Salpha questionnaire was  $11.8 \pm 4.3$  points, 33% were considered as having adequate literacy and 67% inadequate. Salpha and MEEN values showed a positive correlation ( $r=0.5$ ;  $p<0.00$ ). Table 2 shows the relationship between literacy and the characteristics of patients on hemodialysis.

Table 2: Relationship of health literacy with characteristics of patients on hemodialysis.

Variables	Health Literacy		p
	Adequated n (%)	Inadequated n (%)	
Adherent to treatment	112 (79,4)	121 (42,9)	<0,00*
Non-adherent to treatment	29 (20,6)	161 (57,1)	
Cognition with deficit	35 (24,8)	172 (60,1)	<0,00*
Cognition without deficit	106 (75,2)	110 (39,9)	
Men	67 (47,5)	158 (56,0)	0,16*
Women	74 (52,5)	124 (44,0)	
Smoker or ex-smoker	32 (22,7)	115 (40,8)	<0,00*
Never smoked	109 (77,3)	167 (59,2)	
Have had a kidney transplant	23 (16,3)	20 (7,1)	<0,01*
Never transplanted	118 (83,7)	262 (92,9)	
Married	102 (72,3)	226 (80,1)	<0,03*
Single	39 (21,7)	56 (19,9)	
Age (years) (mean±SD)	47,8±14,0	62,0±14,4	<0,00**
Dialysis time (months) [median(CI)]	24 (12-60)	29 (11-60)	0,59***
Minimental (points) [median (CI)]	29 (25-30)	22 (18-26)	<0,00***

\*chi square

\*\* T Test

\*\*\*Mann-Whitney

Those who reported taking an extra dose of medication were less adherent ( $p<0.03$ ), as well as those who reported that they had already missed medication at some point ( $p<0.02$ ). Other adherence characteristics in relation to hemodialysis patient characteristics are described in Table 3.

Table 3: Adherence to the treatment of patients on hemodialysis. N=424

Variables	Total n (%)	Adherents n (%)	Non-adherents n (%)	p*
<b>Sex</b>				
Male	226 (53,3)	119 (52,7)	107 (47,3)	0,26
Female	198 (46,7)	115 (58,0)	83 (42,0)	
<b>Age</b>				
> 61 years	207 (48,8)	76 (36,7)	131 (63,3)	0,00
< 60 years	217 (51,2)	158 (72,8)	59 (27,2)	
<b>Missed days of medication</b>				
Yes	96 (22,7)	36 (37,5)	60 (62,5)	0,00
No	328 (77,3)	198 (60,4)	130 (39,6)	
<b>Education</b>				
≤8 years	277 (65,3)	138 (49,8)	139 (50,2)	0,00

> 9 years	147 (34,7)	96 (65,3)	51 (34,7)	
<b>kidney transplant</b>				
Yes	43 (10,1)	33 (76,8)	10 (23,2)	0,00
No	381 (89,9)	201 (52,8)	180 (47,2)	
<b>Smoker or ex-smoker</b>				
Yes	148 (35)	66 (44,5)	82 (55,4)	0,00
No	276 (65)	168 (60,9)	108 (39,1)	
<b>Multiple daily doses</b>				
Yes	345 (81,3)	163 (47,2)	182 (52,7)	0,00
No	79 (18,6)	71 (89,8)	08 (10,1)	

\*chi square

The time on dialysis of those who adhered to the treatment was longer, but it was not statistically significant (time on dialysis adherents [median 27.0 months CI 24-35] and time on dialysis for non-adherents [median 24 months CI 23-36]  $p=0.35$ ).

Table 4 shows literacy and treatment adherence in relation to age, Salpha value and dialysis time.

Table 4: Literacy and treatment adherence in relation to age, Salpha value and dialysis time.

Variables	Age (years) (mean±SD)	Salpha (mean±SD)	Dialysis time (months)** (median[CI])
<b>Health Literacy</b>			
Adequated	47,9±14,1	16,0±1,3	24 [12-60]
Inadequated	62,0±14,5*	9,7±3,7*	29 [11-60]
<b>Treatment adherence</b>			
Adherents	51,6±14,8	13,2±3,7	27 [12-60]
Non-adherents	64,4±14,1*	10,1±4,3*	24 [10-60]

\* $p<0,00$  (T Test)

\*\*Mann-Whitney

#### IV. DISCUSSION

Health literacy was considered inadequate for most participants, which was also verified in other studies<sup>8,9</sup>. In the united kingdom, a survey with 6,842 patients with kidney disease also found inadequate HL<sup>11</sup>. This theme has brought challenges to health professionals due to the need for adjustments in health strategies for effective care<sup>11</sup>.

Analyzing adherence, in this study more than half of the interviewees were considered non-adherent, similar studies that evaluated patients undergoing hemodialysis also showed that most of them had low adherence to treatment<sup>12,13</sup>.

HL was positively correlated with treatment adherence, demonstrating that patients with low adherence also had low ls. In a literature review on the association of sl and adherence to drug treatment<sup>14</sup>, other studies showed a positive relationship between the association of sl and adherence to drug treatment, which is currently also being verified worldwide<sup>15,16,17</sup>.

Treatment adherence is a very complex situation and ckd has several impacts on the lives of individuals and their families, especially in the hemodialysis stage where the need for a transformation in the individual and family lifestyle occurs<sup>18,19</sup>.

It was evident that sl and treatment adherence were related to the presence of cognitive deficit and older

age. The relationship with age has already been verified in other studies, as years of education and duration of hemodialysis suggest that older people, with less education and longer duration of hemodialysis had more cognitive impairment<sup>20</sup>. Low educational level contributes to the individual having difficulty in understanding the disease and its clinical picture as complications and associated comorbidities<sup>15,21</sup>.

Marital status was also related to low HL and older age. The fact of having a partner was also found in other studies and was probably related to the factor of advanced age and because it represents a source of emotional support<sup>22</sup>. Family support was verified as a role of protection and socialization of its members, in addition to serving as support in coping with the difficulties arising from the chronic disease and its treatment<sup>23</sup>.

The therapeutic regimen and the amount of medication that patients use were not identified as a difficulty in non-adherence. In a literature review, they concluded that, although there is little evidence, treatment carried out in a structured manner can contribute to improving adherence to treatment of individuals on hemodialysis<sup>24</sup>.

Smokers or former smokers and those who have never had a transplant also had worse results in SL, it is noteworthy that inadequate SL can affect health, so that it reduces their self-management capacity for care<sup>25</sup>, in the same way that the lack of knowledge and skills related to health can be considered as a barrier to the adoption of healthy behaviors and in the prevention or management of acute and chronic diseases<sup>26</sup>.

In this research, the dialysis time of those who adhered to the treatment was longer, but it was not statistically significant. The aspects that motivate treatment adherence include living with the hemodialysis machine, performing laboratory tests, faith and the presence of social support, mitigation of complications and adverse events, requiring interaction between the team and the patient with the purpose of understanding the phenomena that lead to the failure of this process and in the development of educational strategies in order to make individuals aware of the importance of adherence to treatment and possible improvement in quality of life<sup>27</sup>.

The analysis of the HL of patients with CKD can be a tool for situational diagnosis and intervention in the way health professionals work in the management and care of hemodialysis patients, as well as knowing in detail the profile of patients and the difficulties encountered in the its treatment can contribute to the construction of actions that involve their adherence. It ratifies the importance of considering the family context as a

supportive source and, mainly, as a factor to be worked on, being necessary to include the family in the teachings and information of the treatment, as a determining factor for the success in the adherence to the treatment.

## V. CONCLUSION

Inadequate literacy was found in most of the study population and was correlated with low adherence to treatment, this relationship was accompanied by cognitive deficit, low education, smoking, high age and not having undergone a kidney transplant before.

The complexity of the factors involved in the treatment of chronic kidney disease patients, and the patients' difficulties in adapting to imposed health habits, must be known to support the planning of actions, highlighting the need for a multidisciplinary approach and the importance of education in health, not in a simplified and isolated way, but with different analyzes and approaches.

Understanding and accepting the importance of dialysis treatment is fundamental, and should enable patients to have their autonomy and active participation in the quest to overcome difficulties.

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