

ORIGINAL ARTICLE

ASSOCIATION BETWEEN FUNCTIONAL HEALTH LITERACY AND SELF-CARE WITH DIABETES MELLITUS*

Givaneide Oliveira de Andrade Luz¹, Dayanne Daphyne de Aguiar Alves², Hysadora Karolinne da Silva Costa³, Jabiael Carneiro da Silva Filho⁴, Priscila Farias Stratmann⁵, Marcos Antonio de Oliveira Souza⁶, Isabel Cristina Ramos Vieira Santos⁷

ABSTRACT

Objective: To associate the level of functional health literacy and self-care with Diabetes. **Method:** A cross-sectional quantitative study conducted with 97 patients from a reference center for diabetic care from February to June 2018. With data from the Brief Test of Functional Health Literacy in Adults and the Diabetes Self-Care Activity Questionnaire. Descriptive analysis and Chi-square test were performed.

Results: Inadequate functional literacy was identified in 47% of the patients. An association was observed between inadequate literacy and low levels of adherence to: follow-up of healthy diet and dietary orientation ($p < 0.001$), sweets intake ($p < 0.001$) and glycemic assessment at the recommended number of times ($p < 0.001$).

Conclusion: Inadequate literacy is associated with low mean levels of adherence to diet-related behaviors and blood glucose monitoring. These findings suggest to include the assessment of literacy and self-care with diabetes in the clinical practice.

DESCRIPTORS: Chronic Disease; Diabetes Mellitus; Habits; Cooperation and Adherence to Treatment; Self-care.


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¹Nurse. PhD student in Nursing. University of Pernambuco. Recife, PE, Brazil. 

²Nursing student. University of Pernambuco. Recife, PE, Brazil. 

³Nursing student. University of Pernambuco. Recife, PE, Brazil. 

⁴Nurse. Master student in Nursing. University of Pernambuco. Recife, PE, Brazil. 

⁵Nurse. Santa Joana Recife Hospital. Recife, PE, Brazil. 

⁶Nurse. PhD student in Nursing. University of Pernambuco. Recife, PE, Brazil. 

⁷Nurse. PhD in Public Health. Professor at the University of Pernambuco. Recife, PE, Brazil. 

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ASSOCIAÇÃO ENTRE O LETRAMENTO FUNCIONAL EM SAÚDE E O AUTOCUIDADO COM O DIABETES MELLITUS**RESUMO**

Objetivo: associar o nível de letramento funcional em saúde e autocuidado com Diabetes. **Método:** estudo transversal, quantitativo, realizado com 97 pacientes de um centro de referência para atenção ao diabético, de fevereiro a junho de 2018. Com dados pelo Brief Test of Functional Health Literacy in Adults e o Questionário de atividades de autocuidado com o diabetes. Foi feita análise descritiva e o teste Qui-quadrado.

Resultados: o letramento funcional inadequado foi identificado em 47% dos pacientes. Observou-se associação entre o letramento inadequado e baixos níveis de adesão a: seguimento de dieta saudável e orientação alimentar ($p < 0,001$), ingestão de doces ($p < 0,001$) e avaliação da glicemia no número de vezes recomendado ($p < 0,001$).

Conclusão: o nível inadequado de letramento está associado com baixas médias de adesão a comportamentos relacionados à dieta e ao monitoramento da glicemia. Estes achados sugerem incluir na prática clínica a avaliação do letramento e de autocuidado com o diabetes.

DESCRIPTORIOS: Doença Crônica; Diabetes Mellitus; Hábitos; Cooperação e Adesão ao Tratamento; Autocuidado.

ASOCIACIÓN ENTRE EL ALFABETISMO FUNCIONAL EN SALUD Y EL AUTOCUIDADO CON LA DIABETES MELLITUS**RESUMEN:**

Objetivo: asociar el nivel de alfabetismo funcional en salud y el autocuidado con la Diabetes. **Método:** estudio transversal y cuantitativo, realizado con 97 pacientes de un centro de referencia para la atención al diabético, de febrero a junio de 2018. Con datos según el Brief Test of Functional Health Literacy in Adults y del Cuestionario de actividades de autocuidado para la diabetes. Se efectuó un análisis descriptivo y la prueba de Chi-cuadrado.

Resultados: se identificó un nivel inadecuado de alfabetismo funcional en el 47% de los pacientes. Se observó una asociación entre el nivel inadecuado de alfabetismo con bajos niveles de adherencia a: seguir una dieta saludable y pautas alimenticias ($p < 0,001$), ingerir dulces ($p < 0,001$) y evaluar la glicemia la cantidad de veces recomendada ($p < 0,001$).

Conclusión: el nivel inadecuado de alfabetismo está asociado con bajos valores medios de adherencia a comportamientos relacionados con la dieta y con el control de la glicemia. Estos hallazgos sugieren que se deben incluir la evaluación del alfabetismo y del autocuidado de la diabetes en la práctica clínica.

DESCRIPTORES: Enfermedad Crónica; Diabetes Mellitus; Hábitos; Cooperación y Adherencia al Tratamiento; Autocuidado.

INTRODUCTION

Diabetes Mellitus (DM) is a metabolic disorder characterized by increased glycaemia, being considered a sensitive condition to primary health care, i.e., when controlled, it avoids hospitalizations and deaths from complications⁽¹⁾.

The world population with diabetes is currently estimated at 387 million and at 471 million by 2035. In Brazil there are 9 million people with the disease and this may go from the 8th to the 6th position in the world ranking in 2030⁽¹⁻²⁾.

DM control and preventing the complications involve, among other aspects, the knowledge and the execution of self-care tasks by the patient, such as: glycemic index monitoring, adequacy of food, foot care and physical activity. This occurs when the patient is well instructed by the health team and when a good professional-patient relationship is developed⁽¹⁾.

In this regard, the low adherence to self-care activities is worrying and has been related to personal, socioeconomic and cultural factors, as well as to aspects related to the disease itself, treatment, the health system and the multidisciplinary team, indicating the need for greater investments in early treatment⁽³⁾.

When diagnosed with DM, the person receives a range of important information for the treatment and control of the disease that requires the need for reading and interpretation. Thus, low schooling represents a challenge for the health professionals in the construction of educational activities or of an effective orientation for self-care⁽⁴⁾.

In addition, there are also people who, despite having an adequate level of formal education, do not understand the guidelines on the disease. The comprehension of information goes beyond the school level, not only being restricted to reading and writing, but also to what the person can do with the information received, thus characterizing Functional Health Literacy (FHL)⁽⁴⁾.

According to the World Health Organization (WHO), FHL consists of "the ability to obtain, process and understand health information in order to make appropriate self-care management decisions"^(5:10), and emerged as an instrument that could mediate educational activities in health services⁽⁶⁾.

In this context it can be inferred that the level of FHL influences the self-care practices of DM considering that, to follow the recommended glycemic control therapy, minimum reading, calculation and proficiency are required to understand the activities required. Thus, the present study aimed to associate the level of FHL and self-care with DM among patients treated at a referral center.

METHOD

This is a cross-sectional study with a quantitative approach, conducted at a reference center for diabetic and hypertensive care in the city of Recife, from February to June 2018.

The study population consisted of diabetes patients assisted at the endocrinology outpatient clinic of the center. After applying the eligibility criteria, 200 patients were available. The sample (n) was calculated using the randomized sample formula for descriptive studies, adopting an expected frequency of 50% (statistical measure adopted when the actual event rate, i.e., health literacy is unknown), margin of acceptable error of 0.05, test power of 80% and 95% confidence interval, totaling 97 patients.

The patients were recruited through a randomized (simple random) draw made from

the outpatient appointment list and, respecting the inclusion criteria: age over 30 years old and those with six months or more of follow-up. On the other hand, as non-eligible for the study, patients were considered with cognitive deficit recorded in the medical record, illiterate (designed as a person who cannot read and write a simple note in the language they know, according to the IBGE), who had hearing and/or speech impairment properly identified by the researcher during the interview or who had visual disturbances as determined by Snellen's visual acuity rating scale.

Data was collected through individual interviews, in rooms of the center itself, using an information questionnaire inherent to the person with the following variables: age, gender, skin color or race, marital status, years of schooling, occupation and family income.

The Brief Test of Functional Health Literacy in Adults (B-TOFHLA) and the Diabetes Self-Care Activity Questionnaire (DSCAQ), both validated for use in Brazil⁽⁷⁻⁸⁾, were applied to check the levels of FHL and self-care with diabetes, respectively.

The B-TOFHLA questionnaire has four numerical items and two text passages with 36 items. The point cut establishes three levels of literacy according to the test score, ranging from 0-53 (inadequate), 54-66 (marginal) and 67-100 (appropriate) used in this study for frequency verification and, in addition to of this, to test for an association between FHL level and adherence to diabetes self-care, this variable was dichotomized at appropriate (above 50) and inadequate (up to 50) levels.

In turn, the diabetes self-care activity questionnaire (DSCAQ) assesses the frequency at which the patient meets what is expected for an adequate self-care in the last week and is divided into six domains: diet, exercise, glycemic control, foot care, medication and smoking. Of these, only the variable related to smoking was not considered because of the greater possibility of information bias. For all domains, zero was considered the least desirable and seven as the most favorable, except for the consumption of high fat and sweet foods, where the values were reversed (7 = 0, 6 = 1, 5 = 2, 4 = 3, 3 = 4, 2 = 5, 1 = 6, 0 = 7).

For the dichotomization required for the statistical test used for association verification, the DSCAQ scores ≥ 5 were considered as indicative of a good self-care behavior according to the literature⁽⁹⁻¹⁰⁾.

Data was analyzed using descriptive statistics, using frequency distribution, mean (M) and median (Md) as measures of central trend and standard deviation (SD) as a measure for dispersion and, to verify the existence of an association between FHL level and self-care, the Chi-square test was used. The significance level was considered through the p value < 0.05 . Data was submitted to the SPSS for Windows statistics program, version 22.0.

The project was approved by the Research Ethics Committee of the Oswaldo Cruz University Hospital/Cardiac Emergency Room of Pernambuco (*Hospital Universitário Oswaldo Cruz/Pronto socorro cardiológico de Pernambuco*, HUOC/PROCAPE), with opinion number 2,681,288.

RESULTS

From the calculated sample ($n=97$), a higher frequency was observed for the age group of 60 years old or older ($M=59.8$; $Md=60$ and $SD=8.4$ years old), female ($n=75$; 77.3%), of marital status married ($n=47$; 48.5%), self-described as brown-skinned ($n=48$; 49.5%), with schooling corresponding to 5-8 years of study ($n=38$; 39.2%), economically active ($n=75$; 77.3%) and whose income equals 2-3 minimum wages ($n=40$; 41.2%), as shown in Table 1.

Table 1 - Distribution of individuals with DM attended at a referral center in the city of Recife. Recife, PE, Brazil, 2018

Variable	n=97 (%)
Age group	
39-59	47 (48.5)
≥ 60	49 (50.5)
Gender	
Male	22 (22.7)
Female	75 (77.3)
Marital status	
Married	47 (48.5)
Divorced	12 (12.4)
Widow/Widower	13 (13.4)
Single	25 (25.8)
Race/Skin color	
Caucasian	22 (22.7)
Black	20 (20.6)
Asian	5 (5.2)
Brown	48 (49.5)
Indigenous	2 (2.1)
Years of study	
4	8 (8.2)
5-8	38 (39.2)
9-11	36 (37.1)
12 or more	15 (15.5)
Occupation	
Retired	22 (22.7)
Economically active	75 (77.3)
Income	
0 to 1 minimum wage	38 (39.2)
2 to 3 minimum wages	40 (41.2)
> 3 minimum wages	16 (16.5)

Table 2 displays the health literacy levels and mean adherence variables for self-care activities with diabetes in the previous seven days. It shows a higher frequency of inadequate literacy and that the highest adherence means were related to drug use (mean above 6) while the lower mean corresponded to the practice of specific physical activities (M=1.90).

Table 2 - Health literacy levels and mean adherence to diabetes self-care activities of patients treated at a referral center in the city of Recife. Recife, PE, Brazil, 2018

Variables	n (%)	Adherence mean (\pm SD)
Health literacy levels		
Inadequate (0-53 points)	46 (47.4)	
Marginal (54-66 points)	22 (22.7)	
Adequate (67-100 points)	29 (29.9)	
Items of DSCAQ*		
1. Following a healthy diet		3.45 (2.50)
2. Following food guidance		2.80 (2.77)
3. Eating five or more servings of fruits and/or vegetables		4.51 (2.52)
4. Eating red meat and/or whole milk derivatives		3.42 (2.50)
5. Eating sweets (inverted value)		4.70 (2.50)
6. Performing physical activities for at least 30 minutes		2.03 (2.57)
7. Performing specific physical activities (walking, swimming etc.)		1.90 (2.53)
8. Evaluating blood sugar		3.69 (3.04)
9. Assessing blood sugar on the recommended number of times		3.15 (2.99)
10. Examining one's feet		4.02 (3.24)
11. Examining inside shoes before putting them on		3.88 (3.26)
12. Drying the spaces between the toes after washing them		5.07 (2.96)
13. Taking diabetes medications as recommended		6.85 (0.82)
14. Taking insulin injections as recommended		6.22 (2.05)
15. Taking the indicated number of diabetes pills		6.75 (1.12)

*DSCAQ: Diabetes Self-Care Activity Questionnaire.

**Mean adherence in days per week (\pm standard deviation) for self-care activities in the previous seven days.

Table 3 shows that of the variables of the diabetes self-care activity questionnaire, those associated with inadequate FHL were the following: following a healthy diet, following the dietary orientation and the blood glucose assessment at the recommended number of times, all with a statistically significant difference ($p < 0.001$). Regarding the intake of sweets, it should be considered for analysis that, as its score is inverted in relation to the other indicators, a higher frequency for the score < 5 is expected for good adherence to self-care and this was associated with adequate functional literacy.

Table 3 – Association between FHL level and self-care with DM among the patients seen at a referral center in the city of Recife. Recife, PE, Brazil, 2018 (continues)

DSCAQ scores	Functional Health Literacy		
	Inadequate n (%)	Adequate n (%)	p-value*
Following a healthy diet			

< 5	41 (60.3)	18 (39.7)	0
≥ 5	27 (62.1)	11 (37.9)	
Following food guidance			
< 5	44 (64.7)	24 (35.3)	0
≥ 5	18 (62.1)	11 (37.9)	
Eating five or more servings of fruits and/or vegetables			
< 5	30 (44.1)	38 (55.9)	0.60
≥ 5	16 (55.2)	13 (44.8)	
Eating red meat and/or whole milk derivatives			
< 5	36 (52.9)	32 (47.1)	0.40
≥ 5	18 (62.1)	11 (37.9)	
Eating sweets			
< 5	24 (35.3)	44 (64.7)	0
≥ 5	11 (37.9)	18 (62.1)	
Performing physical activities for at least 30 minutes			
< 5	50 (73.5)	18 (26.5)	1.21
≥ 5	25 (86.2)	4 (13.8)	
Performing specific physical activities			
< 5	53 (77.9)	15 (22.1)	0.43
≥ 5	25 (86.2)	4 (13.8)	
Evaluating blood sugar			
< 5	41 (61.2)	26 (38.8)	0.90
≥ 5	14 (48.3)	15 (51.7)	
Assessing blood sugar on the recommended number of times			
< 5	43 (64.2)	24 (35.8)	0
≥ 5	18 (62.1)	11 (37.9)	
Examining one's feet			
< 5	29 (42.6)	39 (57.4)	0.36
≥ 5	15 (51.7)	14 (48.3)	
Examining inside shoes before putting them on			
< 5	35 (51.5)	33 (48.5)	0.14
≥ 5	13 (44.8)	16 (55.2)	
Drying the spaces between the toes after washing them			
< 5	19 (27.9)	49 (72.1)	0.95
≥ 5	9 (31.0)	20 (69.0)	
Taking diabetes medications as recommended			
< 5	1 (1.5)	66 (98.5)	0.35
≥ 5	1 (3.4)	28 (96.6)	
Taking insulin injections as recommended			
< 5	4 (9.8)	37 (90.2)	0.46

≥ 5	3 (15.8)	16 (84.2)	
Taking the indicated number of diabetes pills			
< 5	1 (1.5)	64 (98.5)	0.84
≥ 5	2 (8.3)	22 (91.7)	

*Chi square test

DISCUSSION

Patient self-care is crucial in preventing Type 2 Diabetes-related complications and mortality, and comprises a range of skills and knowledge that must be imparted to them throughout the health care team in a clear and objective manner. This is because, in this disease, self-care is more challenging than for any other non-communicable chronic disease, requiring activities of different levels of complexity such as: blood glucose monitoring, medication management, eating habits, and physical activity⁽¹¹⁾.

The results of this study demonstrate that the higher frequency of the sample had an inadequate FHL and agree with those of a similar study conducted in Belém-PA⁽⁶⁾ and another held in Ceará⁽⁴⁾, this latter with a smaller sample than ours and of hospital origin. A low FHL level of is common among DM patients, with estimates ranging from 15 to 40% depending on the sampled population⁽¹²⁾.

In addition to this, the analysis of the results of adherence to self-care activities, according to the established cutoff point, showed that, except for drug-related activities, all other aspects of self-care had low adherence (means below five), especially for those of physical activity whose adhesion averages were between 1.90 and 2.03. Therefore, it is noted that, even with public investments aimed at stimulating the practice of physical activity of the population, its benefits have not yet reached the portion of people aged 60 years old or older that constituted the sample of this study.

Insufficient physical activity is a key risk factor for non-communicable diseases such as diabetes, according to the WHO, and recommends that adults aged 18 to 65 or older should do at least 150 minutes of moderate-intensity physical activity during the week, or at least 75 minutes of vigorous intensity physical activity, or an equivalent combination of both⁽¹³⁾.

Maintaining a physically active lifestyle is associated with better health in old age⁽¹⁴⁾. The adaptations of physiological systems required by physical activity, most notably the neuromuscular system to coordinate movement, the cardiopulmonary system to distribute oxygen and nutrients more efficiently, and metabolic processes, particularly those that regulate glucose and fatty acid metabolism, collectively increase aerobic power and physical capacity⁽¹⁵⁾. These aspects should be presented to DM patients in medical and nursing consultations, so that they learn and incorporate these practices into their lifestyle.

Regarding the means of adherence to self-care activities with diabetes, the patients in the sample had low adherence to all aspects related to diet, only sweets intake was close to desirable. This is possibly related to the emphasis placed on guiding glycemic control through the prohibition of sugar in the diet and drug usage. However, eating habits and sedentary lifestyle are pointed as major factors for the rapid increase in the incidence of DM in developing countries⁽¹⁶⁾.

There is increasing recognition that the focus of dietary advice should be on healthy eating patterns rather than nutrients. Evidence supports avoiding processed foods, refined grains, processed red meats, sugary drinks, and promoting fiber, vegetable and yogurt intake. Dietary counseling should be individualized and take into account personal, cultural

and social factors⁽¹⁷⁾. Given this, in the exercise of the consultation, the nurse should consider the functional health literacy of the patient in addition to other aspects such as age, education and economic conditions, in order to provide contextualized guidance and, therefore, effective and efficient.

In this study, blood glucose monitoring obtained poor adherence mean values regarding both its practice and the desired frequency. This result is comparable to a study conducted in Malaysia⁽¹⁸⁾.

The low means of adherence to blood glucose testing in the study population highlights the need to better educate patients about this procedure during nursing consultations, as shown in a study conducted in Germany, that self-care with diabetes is strongly related to glycemic control, accounting for 21 to 28% of glycemic variation⁽¹⁹⁾. This poor adherence can also be explained by the scarce availability of glucometers or other necessary artifacts, even among those who use insulin.

Only one of the three foot self-care activities achieved a desirable mean value. These results agree with those of a study conducted in Piauí⁽²⁰⁾ and opposes the results of another, similar in nature to ours, carried out in Ceará⁽⁴⁾. In this regard, the literature stresses that high-risk patients should be taught to properly inspect and protect their feet, as well as skin care to prevent complications⁽²¹⁻²²⁾.

In addition to the need for teaching, the positive correlation between FHL and self-care behaviors has been demonstrated, suggesting that greater literacy in patients with diabetes may improve their self-care behaviors⁽²³⁾. In this regard, the results herein submitted identified a statistically significant association between inadequate FHL level and the behaviors of following a healthy diet and dietary guidance, eating sweets and evaluating blood sugar as often as recommended.

Regarding the aspects related to diet, a review study emphasizes that awareness of the complications of diabetes and the consequent improvement in knowledge, attitude and practices regarding diet lead to better disease control⁽¹⁶⁾. Therefore, health professionals should encourage patients to understand the importance of the diet that can help in the management of their disease, proper self-care and better quality of life, and this should be guided by a thorough knowledge of functional health literacy and the social and economic aspects of the described population.

Regarding the practice of blood glucose assessment, our findings are in line with those of a study conducted in São Paulo with elderly diabetics in outpatient care⁽²⁴⁾.

FHL is potentially associated with inadequate glycemic control and micro and macrovascular complications. Low FHL may hinder the level of understanding required for glucose monitoring and may be one of the complicating factors that may interfere with blood glucose control and maximize the repercussions of disease progression⁽⁶⁾.

The limitations of this study refer to the cross-sectional design adopted, which does not allow evaluating the variations in self-care behavior, since it takes a single measure of the studied phenomenon. In addition, the measure taken depends on the person's willingness to reveal, in fact, his or her self-care behavior and memory capacity.

CONCLUSION

Regarding what was exposed about health literacy and adherence to self-care activities with diabetes, a significant number is perceived of patients with inadequate FHL and low adherence, especially related to diet, physical activity, blood glucose control and foot care, expressed by the low average indicators of each of these variables.

Thus, the objective of this study was achieved since there was a significant association

between inadequate FHL and aspects related to diet and glycemic control.

The study shows that the disease is not adequately controlled and reveals the need for interventions to improve treatment adherence. For such, it is necessary to incorporate the evaluation of the level of health literacy in the clinical practice, especially in face of the social adversities that mark the studied population, in order to provide understandable orientations, besides the vigilance about the adherence to the self-care activities.

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Corresponding author:

Hysadora Karolinne da Silva Costa

Universidade de Pernambuco.

R. Doutora Itamar de Moraes e Silva, 149 – 50850160 - Recife, PE, Brasil

E-mail: hysadorakarolinne@hotmail.com

Role of Authors:

Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work - DDAA, HKSC, JCSF, PFS, MAOS, ICRVS

Final approval of the version to be published - ICRVS

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