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ORIGINALES

Knowledge and attitude towards the disease of people with diabetes mellitus assisted in Primary Health Care

Conhecimento e atitude frente a doença de pessoas com diabétes mellitus assistidas na Atenção Primária à Saúde

Conocimiento y actitud frente a la enfermedad de personas con diabetes mellitus atendidas en Atención Primaria

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ABSTRACT:

Objective: To verify the prevalence of knowledge and attitude of people with diabetes mellitus type 2 in relation to the disease and associated factors.

Methods: A household survey of 398 people with diabetes mellitus type 2 enrolled in Primary Care. Three questionnaires were applied: one for sociodemographic and clinical data collection; the Diabetes Knowledge Questionnaire (DKN-A) and the Diabetes Attitude Questionnaire (ATT-19). For data analysis, bivariate tests and multiple logistic regression were used.

Results: More than half of the individuals (55.8%) presented unsatisfactory knowledge about the disease and the majority (92.2%) had difficulty in coping with it. There was an association between knowledge about the disease with eight or more years of study, normal waist hip ratio, regular capillary blood glucose check, and inverse relationship with time of diagnosis <10 years. The positive attitude towards the disease presented an association with age between 50 and 60 years and, conversely, with episodes of hyperglycemia**.**

Conclusion: The prevalence of knowledge and positive attitudes towards the disease was considered low. As for the associated factors, most of those evidenced in this study are not subject to modification, reinforcing the importance of health promotion activities that are especially focused on the groups that present these factors.

Keywords: Diabetes Mellitus, Attitude to Health, Knowledge, Health Knowledge, Attitudes, Practice.

RESUMO:

Objetivo: Verificar a prevalência do conhecimento e atitude de pessoas com diabetes mellitus tipo 2 em relação à doença e os fatores associados.

Métodos: Inquérito domiciliar realizado com 398 pessoas com diabetes mellitus tipo 2 cadastradas na Atenção Primária. Foram aplicados três questionários: um para levantamento de dados sóciodemográficos e clínicos; o Diabetes Knowledge Questionnaire (DKN-A) e o Diabetes Attitude Questionnaire (ATT-19). Para análise dos dados, utilizou-se testes bivariados e regressão logística múltipla.

Resultados: Mais da metade dos indivíduos (55,8%) apresentou conhecimento insatisfatório sobre a doença e a maioria (92,2%), dificuldade para o seu enfrentamento. Verificou-se associação entre conhecimento sobre a doença com oito ou mais anos de estudo, relação cintura quadril normal, verificação da glicemia capilar regular e, relação inversa com o tempo de diagnóstico <10 anos. A atitude positiva frente a doença apresentou associação com idade entre 50 a 60 anos e, de modo inverso, com episódios de hiperglicemia.

Conclusão: A prevalência de conhecimento e atitudes positivas frente à doença foi considerada reduzida. Quanto aos fatores associados, salienta-se que a maioria daqueles evidenciados nesse estudo não são passíveis de modificação, reforçando a importância das atividades de promoção da saúde focadas sobremaneira nos grupos que apresentam estes fatores.

Palavras-chave: Diabetes Mellitus; Atitude frente à saúde; Conhecimentos, atitudes e prática em saúde

RESUMEN:

Objetivo: Determinar la prevalencia de los conocimientos y la actitud de las personas con diabetes mellitus tipo 2 en relación con la enfermedad y los factores asociados.

Métodos: Investigación en los domicilios con 398 personas con diabetes mellitus tipo 2 inscritas en Atención Primaria. Se aplicaron tres cuestionarios: uno para el levantamiento de datos sociodemográficos y clínicos; el conocimiento de la diabetes Cuestionario (DKN-A) y la actitud de la diabetes Cuestionario (ATT-19). Para el análisis de datos, se utilizaron las pruebas bivariados y de regresión logística múltiple.

Resultados: Más de la mitad de los sujetos (55,8%) tenía poco conocimiento sobre la enfermedad y la mayoría (92,2%), dificultad para resolverlos. Se verificó asociación entre el conocimiento acerca de la enfermedad con ocho o más años de estudio, cintura normal de la cadera, verificación de la glucosa en sangre regularmente, y relación inversa con el tiempo de diagnóstico <10 años. La actitud positiva hacia la enfermedad se asoció con edad entre 50 y 60 años y, a la inversa, con episodios de hiperglucemia.

Conclusión: La baja prevalencia de conocimientos y actitudes positivas a la enfermedad. En cuanto a los factores asociados, cabe señalar que la mayoría de los destacados en este estudio no son modificables, lo que refuerza la importancia de que las actividades de promoción de la salud se centraron en gran medida en los grupos con estos factores.

Palabras clave: Diabetes mellitus; La actitud de la salud; Conocimientos; actitudes y práctica.

INTRODUCTION

In the last decade, diabetes mellitus type 2 (DM2) has become an important global public health problem, mainly due to the increase in its prevalence. In 2011, there were 366 million people with DM2 in the world, with an expected increase to 552 million in 2030 [(1)]. In 1995, Brazil had 4.9 million people diagnosed with DM2, with an estimated increase of 19.2 million by 2035, which will lead the country to the 4th place in the ranking of countries with the highest number of people with diabetes in the age group of 20 to 79 years [(1-2)]. Confirming this estimate, in 2011 the prevalence of diabetes in the adult population in the country was already 9.9% [(3)].

DM2 interferes in all dimensions of the person´s life who receives the diagnosis, from a trivial routine to the desire to continue to live in a healthy way, including the need for changes in lifestyle, especially regarding to diet and willingness to practice physical

activities. Thus, a good coexistence with the disease requires coping capacity, considering the necessary adjustments to maintain a good metabolic control [4]. However, the commitment to follow the treatment or the desire to interrupt it, translated into a positive or negative attitude towards the disease, is always present in the daily life of the person with DM2 [5].

Indeed, the attitude towards disease is a key point in the adoption and maintenance of certain patterns of behavior, since it represents a predisposition for adopting self-care actions, favoring the reduction of stress associated with the disease, greater receptivity to treatment, improvement of self-esteem and a sense of self-efficacy, as well as a more positive perception about health [6].

Nevertheless, the knowledge about the disease, means the set of information that the person needs to have in order to properly manage his or her health condition. In addition to knowledge, other variables also interfere with behavior change, such as: schooling, diagnosis time, health and illness beliefs, family support, and accessibility to health services, among others [7]. Knowledge about the disease and about the need for self-care is a central aspect of DM2 treatment. Its importance is recognized in several studies, regardless of socioeconomic and cultural characteristics [5,6,8].

Although knowledge and attitudes toward disease are factors that interfere with metabolic control and adherence to treatment, studies [4-5,8] have shown reduced understanding and knowledge of individuals with diabetes about the disease, and the difficulties experienced in their management, due to a negative attitude toward it. It is also known that knowledge and attitude towards the disease can be influenced by sociodemographic and clinical variables, however, studies that analyze this relationship are still scarce [7]. This way, the objective of the study was to verify the prevalence of knowledge and positive attitudes of people with diabetes mellitus type 2 in relation to the disease and associated factors.

METHOD

Descriptive study, with a cross-sectional design, carried out with individuals enrolled in the Hypertensive and Diabetic Registration and Monitoring System - HIPERDIA, of all Basic Health Units located in the urban area of the city of Maringá, Paraná, Brazil. At the time of data collection, the municipality had a population of approximately 370,000 inhabitants [5], had 23 Basic Health Units (UBS) organized in five regional health, 64 Teams of the Family Health Strategy and 4,531 people with diabetes type 2 enrolled in the municipality´s basic health attendance.

The sample size to be studied was calculated from the total number of individuals with diabetes enrolled in Hiperdia, considering a prevalence of 50%, error of 5% and reliability of 95%, totaling a sample of 336 individuals, added 20% for possible losses, resulted in 420 individuals. Through proportional stratification, the number of individuals from each UBS to be included in the study was defined. They were selected by random lottery, from the list of subscribers in each UBS.

The inclusion criteria were to be 18 years of age or older and not have impairing intellectual conditions that interfere in the comprehension and answering of the questionnaire. It is worth noting that the cases of refusal (one), death (eight) and change of address (51) have been replaced by the next individuals on the list, and a

maximum of three substitution attempts could be performed. After the exclusions, the sample consisted of 398 individuals with diabetes.

Data collection was performed from April to September 2011, in the individuals' homes, through a semi-structured interview using three instruments: one with sociodemographic, economic, clinical and laboratory variables, and the other two correspond to the versions of the questionnaires DKN-A and ATT-19, both translated into Portuguese and validated in Brazil [9].

The DKN-A is a questionnaire consisting of 15 statements related to the different aspects of the general knowledge of DM, organized into five categories: basic psychology, hypoglycemia, food groups, disease management and general principles of care. For each correct answer a point is assigned, and a score greater than or equal to eight points characterizes knowledge about the disease [9].

The ATT-19 [9] is a questionnaire consisting of 19 questions that measures the psychological adjustment for DM and encompasses six factors: stress associated with DM, receptivity to treatment, confidence in treatment, personal efficacy, health perception and social acceptance. Each statement is answered with a five-point Likert type scale, which ranges from "high disagreement" to "high agreement". The overall score ranges from 19 to 95 points, with a score greater than seventy points indicating a positive attitude about the disease. In the test-retest reliability analysis of the instruments, Kappa coefficients were found, varying from 0.56 to 0.69 for DKN-A and from 0.45 to 0.60 for ATT-19, indicating a level of reliability moderate for both [9].

The dependent variables of the study were satisfactory knowledge about the disease and positive attitude towards the disease, categorized in yes (Y=0) and no (Y=1). The independent variables were: a) demographic characteristics: age, categorized as < 50, 51-60 and > 60 years, schooling ≤ 8 and > 8 years, marital status with and without partner, white and non-white, current occupation and family income in minimum wages; b) clinical: Body Mass Index - BMI normal and altered [10]; Waist Hip Ratio - WHR normal and altered; time of diagnosis of diabetes grouped in ≤ 10, 10 to 19 and ≥ 20; report of comorbidities and complications due to diabetes; frequency of glycemic monitoring and hypertension; c) laboratory for the last six months: high density lipoprotein - HDL-C normal/altered and; presence of hypoglycemia and hyperglycemia. For the BMI group, weight and height were verified, being low weight and eutrophic classified as normal, and overweight and obesity as altered BMI.

Normal WHR for women when ≤ 0.85 and for men when ≤ 0.90 [2]. The laboratory indicators used were the tests performed at the UBS in the last six months, with fasting glycemia being considered normal between 90 and 120 mg/dl and HDL cholesterol for men > 40 mg/dl and for women > 50 mg/dl [11].

The data were recorded and organized in a spreadsheet previously elaborated in the Microsoft Office Excel 2007 program, with double typing. Data processing and analysis were performed using SAS System 9.1.3 software. In the data analysis, initially, all the independent variables were tested in relation to the dependent variable (ATT and DKN outcomes), using the bivariate tests: Chi-square, Yates corrected Chi-square or Fisher exact, being selected those that presented $p < 0.20$, to be submitted to the second stage of the analysis.

In this second stage, the multivariate analysis (multiple logistic regression) was used and, through the stepwise procedure, the significant variables were selected at 5% for the outcome. This procedure informed the Odds Ratio (OR), the Confidence Interval (CI) of 95%, and the respective p-value for each independent variable analyzed. The good adjustment of the model was verified through the Hosmer and Lemeshow test.

The study was developed in accordance with the guidelines disciplined by Resolution No. 196/96 of the National Health Council, and the project was approved by the Ethics Committee in Research with Human Beings of the signatory institution (Protocol No. 705/2010). All participants signed the Informed Consent Term.

RESULTS

Of the 398 study subjects, the majority was female (68.1%). The mean age of the women was 62.7 (± 10.6) years and the mean age of the men was 63.14 (± 11.0) years. The majority had up to eight years of study (81%), partner (65.6%) and white (75.8%). More than half (59.4%) had a family income of at most three minimum wages, a significant portion (43%) reported a disease evolution time between 10 and 20 years, and the majority (77.8%) reported some comorbidity.

More than half of the participants (55.8%) presented unsatisfactory knowledge about the disease, with no differences between the sexes, and the clear majority (92.2%) did not show a positive attitude toward it. The Chi-square test showed no association (*p*=0.912) between positive attitude and knowledge about the disease.

The bivariate analysis showed a significant association between the satisfactory knowledge of the disease with schooling > 8 years and marital status with partner. On the other hand, the positive attitude towards the disease was associated with age ≥ 60 years, white color and family income < 3 minimum wages (Table 1).

Table 1. Bivariate analysis of sociodemographic and economic variables, according to satisfactory knowledge about the disease and positive attitudes towards it (ATT-19 and DKN-A). Maringá, PR, Brazil, 2011.

Variables		Positive attitude			Satisfactory knowledge		
	Total	n	%	*p*	n	%	*p*
Schooling (years)				0.170			0.002
≥ 8		3	0.7		45	11.3	
< 8		28	7.0		130	32.8	
Age (years)				0.030†			0.064
< 50		2	0.5		20	5.0	
50 ├ 60		13	3.2		47	11.8	
≥ 60		16	4.0		109	27.3	
Marital Status				0.190			0.025
With partner		17	4.3		126	31.6	
Without partner		14	3.5		50	12.5	
Color				0.049			0.940
White		19	4.8		133	33.5	
Non-white		12	3.0		42	10.5	
Current Occupation				0.690			0.137
Remunerated		21	5.3		118	29.6	
Unpaid		10	2.5		58	14.5	

Family Income (SM *)			0.047†			0.052
< 3	25	6.3		91	23	
3 ├ 5	5	1.3		61	15.4	
≥ 5	1	0.2		21	5.3	

* Minimum wages; † Yates Corrected Chi-square Test

Regarding the clinical and laboratory variables, it was observed that the altered WHR (p = 0.002), the diagnosis time between 10 and 20 years (p = 0.030), presence of comorbidities (p = 0.003) and glycemic monitoring (p <0.001) had a significant association with the satisfactory knowledge of the disease. The presence of self-reported complications (p = 0.044), absence of history of hypoglycemia (p = 0.049), and hyperglycemia in the last six months (p = 0.005) were associated with positive attitude towards disease (Table 2) .

Table 2. Bivariate analysis of clinical and laboratory variables, according to satisfactory knowledge about the disease and positive attitudes towards it (ATT-19 and DKN-A). Maringá, PR, Brazil, 2011.

Variables	Total	Positive attitude			Satisfactory knowledge		
		n	%	*p*	n	%	*p*
BMI*				0.144			0.710
Normal		27	6.7		136	34.1	
Altered		4	1.0		40	10.0	
WHR†				0.340‖			0.020
Normal		0	0.0		10	2.5	
Altered		31	7.8		166	41.7	
Diagnosis time. DM‡ (years)				0.580			0.030
< 10		10	2.5		62	15.5	
10 ├ 20		16	4.0		74	18.5	
≥ 20		5	1.3		40	10.0	
Comorbidities				0.082			0.003
No		3	0.7		51	12.8	
Yes		28	7.0		125	31.4	
Complications due to diabetes				0.044			0.712
No		14	3.5		111	27.8	
Yes		17	4.3		65	16.3	
Physical activity				0.086			0.190
No		26	6.5		118	29.6	
Yes		5	1.3		58	14.5	
HDL§				0.179			0.783
Altered		6	1.5		45	11.3	
Normal		20	5.0		80	20.1	
Hypoglycemia				0.049			0.794
No		17	4.3		125	31.4	
Yes		14	3.5		51	12.8	
Hyperglycemia				0.005			0.782
No		12	3.0		111	27.8	
Yes		19	4.8		65	16.3	
Glycemia monitoring				0.094			0.000
No		23	5.7		85	21.3	

Yes	8	2.0		91	22.8	
HIPERDIA participation			0.073			0.315
No	17	4.3		65	16.3	
Yes	14	3.5		111	27.8	

* Body Mass Index; † Hip Waist Ratio; ‡ Diabetes Mellitus Type 2; § High Density Lipoprotein; ‖ Fisher's Exact Test.

In the multivariate analysis, it was observed that the variables schooling, WHR, disease diagnosis time and frequent monitoring of capillary glycemia had a significant association with satisfactory knowledge about DM (Table 3).

In addition, positive knowledge about the disease has twice the chance of existing among individuals with more than eight years of schooling and 4.39 times among those with normal WHR. Individuals with frequent monitoring of capillary glycemia had a 2.16 times chance of having an adequate understanding about self-care related to the disease, and those with less than 10 years of diagnosis had an inverse association with knowledge. (Table 3).

Table 3. Multiple analysis of sociodemographic, economic, clinical and laboratory variables, according to satisfactory knowledge about the disease (DKN-A). Maringá, PR, Brazil, 2011.

Variable	*n*	*%*	*OR*[§]	*CI*[‖] *(OR: 95%)*		*p*
Schooling (years)						
≥ 8	45	11.3	2.22	1.214	4.064	0.009
< 8	130	32.8	1			
Age (years)						
< 50	20	5.0	1			
50 ├ 60	47	11.8	1.27	0.539	3.015	0.320
≥ 60	109	27.3	0.89	0.394	2.021	0.396
Marital status						
With partner	126	31.6	1.40	0.873	2.262	0.162
Without partner	50	12.5	1			
Current Occupation						
Remunerated	118	29.6	0.72	0.443	1.163	0.178
Unpaid	58	14.5	1			
Family Income (SM *)						
< 3	91	23	1			
3 ├ 5	61	15.4	1.54	0.953	2.490	0.060
≥ 5	21	5.3	0.84	0.391	1.811	0.308
WHR[†]						
Normal	10	2.5	4.39	1.076	17.913	0.039
Altered	166	41.7	1			
Diagnosis time. DM[‡] (anos)						
< 10	62	15.5	0.44	0.234	0.838	0.036
10 ├ 20	74	18.5	0.54	0.296	1.005	0.386
≥ 20	40	10.0	1			
Comorbidities						
No	51	12.8	1.58	0.930	2.674	0.091
Yes	125	31.4	1			
Physical activity						
No	118	29.6	0.83	0.515	1.331	0.436

Yes	58	14.5	1			
Glycemia monitoring						
No	85	21.3	1			
Yes	91	22.8	2.16	1.385	3.379	<0.001

* Minimum wages; † Hip Waist Ratio; ‡ Diabetes Mellitus Type 2; § Odds Ratio (Chance Ratio). ‖ Confidence Interval. Adjustment quality of the Hosmer-Lemeshow model = *0.1984.*

The positive attitude (ATT-19) in relation to the disease has approximately 3.4 chances of existing among individuals aged between 50 and 60 years, when compared to the other age groups. Those who reported episodes of hyperglycemia had an inverse association with the positive attitude (Table 4).

Table 4. Multiple analysis of sociodemographic, economic, clinical and laboratory variables in relation to the positive attitude towards disease (ATT-19). Maringá, PR, Brazil, 2011.

Variable	*n*	*%*	*OR**	*CI† (OR,95%)*		*p*
Age (years)						
< 50	2	0.5	1			
50 ├ 60	13	3.2	3,44	0.670	17.628	0.021
≥ 60	16	4.0	1,04	0.208	5.195	0.258
Marital status						
With partner	17	4.3	0.53	0.234	1.187	0.122
Without partner	14	3.5	1			
Color						
White	19	4.8	0.55	0.236	1.280	0.165
Non-white	12	3.0	1			
Family Income (SM)						
< 3	25	6.3	1			
3 ├ 5	5	1.3	0.36	0.129	1.031	0.890
≥ 5	1	0.2	0.16	0.020	1.330	0.223
BMI						
Normal	27	6.7	1.85	0.600	5.689	0.285
Altered	4	1.0	1			
Complications due to diabetes						
No	14	3.5	0.59	0.269	1.327	0.206
Yes	17	4.3	1			
Hypoglycemia						
No	17	4.3	0.62	0.271	1.409	0.253
Yes	14	3.5	1			
Hyperglycemia						
No	12	3.0	0.34	0.149	0.777	0.010
Yes	19	4.8	1			
HIPERDIA						
No	17	4.3	1			
Yes	14	3.5	0.51	0.231	1.130	0.097

Hosmer-Lemeshow model adjustment quality = 0.825; * OR = Odds Ratio. † CI (OR; 95%) = Confidence Interval.

DISCUSSION

The mean age and gender of the subjects under study reinforces what has been found in the literature, that DM is more prevalent in older people and among women [12]. Regarding schooling and income, it is observed that the results corroborate with those of other studies that also indicate a low degree of education and income [9,11-13]. This way, the low level of education associated with low income may favor non-adherence to the therapeutic plan [4].

The majority had a partner, and this is important because it has been identified that individuals with diabetes who have a partner, particularly men, better control the disease [13]. As for the diagnosis time of the disease, almost half of the individuals have a diagnosis of DM2 between 10 and 20 years of age, which is consistent with the literature, which indicates an average time of evolution of the disease around 10 years [5.14]. Studies show that the time of diagnosis has an inverse relationship with adherence to treatment [15], besides establishing association with the acquisition of knowledge and readiness for self-care in DM2 [4].

Regarding knowledge scores and attitudes, the results indicate that most of the participants have a poor understanding of self-care practices and a low readiness to manage the disease. Therefore, they do not have a positive attitude towards the expected changes in lifestyle essential for achieving good metabolic control, as this has also been shown in other studies [5].

On the other hand, it is necessary to consider that knowledge does not always lead to a change of attitude in relation to the daily demands that the treatment imposes in daily life [4], which is evidenced in the results of the present study, since the proportion of individuals with satisfactory knowledge about the disease, is almost six times greater than that of those who have demonstrated a positive attitude towards it.

DM2 causes significant changes in the relationship that the affected person establishes with their own body and with the world around them, and the need to change their habits of life, associated with the need to adhere to a drug therapy, makes living with the disease very difficult [6].

The results indicate that schooling, WHR, time of diagnosis and monitoring of capillary glycemia were associated with knowledge about the disease, which were also identified in three other studies, which found that more years of schooling, longer duration of the disease and frequent verification of capillary glycemia are predictors of better knowledge of diabetes [5,16,17].

It was observed that individuals with more than eight years of schooling are twice as likely to have adequate knowledge about the disease as those with less schooling. A higher level of education may facilitate understanding of the disease, since as the complexity of treatment increases, individuals need more complex cognitive skills to control the desease [18]. A study carried out in Turkey concluded that 12 years of formal education is the minimum limit for patients to be able to understand the disease, to participate in health care, and most importantly, to learn to cope with the disease [19].

The adequate WHR was associated with knowledge about the disease. No other studies have been found that evaluated this relationship, however, it is believed that

individuals who adopt a health behavior that allows them to have an adequate WHR are more educated and, therefore, have a better knowledge about the disease.

It was also verified an inverse association between diagnosis time less than 10 years and better knowledge indexes about the disease, which may be related to the fact already demonstrated in the literature, that a longer diagnosis is associated with a better knowledge about the disease [5,16-17]. Although the time of living with the disease favors exposure to information about it, it is necessary to consider that socioeconomic and cultural factors influenced by personal aspects (social/family support, psychological aspects and perception of the disease) and access to health services, can influence the acquisition of knowledge [20].

It was observed an association between knowledge about the disease and frequent monitoring of capillary glycemia, which was also verified in another study developed in a small city of São Paulo state, with 82 adults with diabetes participating in an educational program, whose results suggest that the majority of the participants had a good knowledge about the disease and the strategies necessary for adherence to self-care, and the verification of capillary glycemia is frequent in the daily life of these individuals [6].

It was verified that people aged between 50 and 60 years and who reported episode of hyperglycemia in the last six months, were more likely to present a positive attitude towards the disease. Although episodes of hypeglycemia represent a serious problem for people under 65 years of age, since they will still have to live many years with the disease; the coping of it and the satisfactory maintenance of capillary glycemia occur more frequently, since younger individuals are usually more open to changes related to the disease [23].

In turn, the sporadic presence of hyperglycemia events may favor a better management of the disease, since the absence of symptoms of the disease is associated with reduced adherence to treatment [8] and healthy practices, such as frequent physical activity and adequate diet [18].

Finally, there was no significant association between knowledge and attitude, however, it must be considered that both are associated with a better offer of guidance and information by health professionals. In this context, individuals with diabetes need systematic follow-up with a multiprofessional health team, since it can offer the necessary tools for proper self-care and disease management. These tools are related to information that can deal with day-to-day situations arising from illness such as acceptance of the necessary changes, food decision making, correct use of prescribed medications, monitoring of capillary glycemia at home, and the comorbidities [5].

Therefore, it is necessary for professionals to be sensitized about the importance of hidden and expressed complaints, so that the clinical decision is shared, in order to strengthen the professional-patient bond, a central part for the acquisition and maintenance of a positive attitude in relation to the disease.

CONCLUSION

The results of this study pointed out that having eight or more years of study, adequate WHR and frequent monitoring of capillary glycemia were positively associated with satisfactory knowledge about the disease, while a diagnosis time of less than 10 years

was negatively associated. On the other hand, a positive attitude towards the disease was related to age between 50 and 60 years old and, inversely, to events of hyperglycemia.

These issues, therefore, are a challenge for the health department, since normal WHR, capillary glycemia and episodes of hyperglycemia, which have been shown to be associated with satisfactory knowledge and a positive attitude toward the disease, can be modified . This aspect highlights the importance of strengthening actions and education and health promotion.

In addition, the study also points out the need for a differentiated look for those with low schooling, lower diagnosis time, inadequate WHR and bordering age, since these aspects directly interfere in the knowledge about the disease and the attitudes towards it, which in turn, may favor/hinder adherence to treatment and, consequently, the efficient management of the disease.

It is believed that these findings may stimulate new studies, since the complexity of DM2 and its treatment still imposes great challenges for the planning of health education actions more innovative and effective for the empowerment of individuals with low schooling and advanced age, characteristics unmodifiable and predominant in the population served by public health services.

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