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Knowledge of diabetic individuals about the benefits and sources of food fiber

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Conocimiento de personas diabéticas sobre los beneficios y fuentes de la fibra alimentaria

Conhecimento de indivíduos diabéticos sobre os benefícios e fontes da fibra alimentar

ABSTRACT

This study assessed the level of knowledge about dietary fiber in diabetic individuals. This is a cross-sectional epidemiological study. The data were collected through questionnaires. Some participants presented superficial knowledge about dietary fibers. The nutritionist is essential in the Basic Health Units to strengthen access to information.
DESCRIPTORS: Diabetes Mellitus; Nutritional Status; Diet Healthy, Dietary Fiber.

RESUMEN

Este estudio evaluó el nivel de conocimiento sobre la fibra dietética en personas diabéticas. Este es un estudio epidemiológico transversal. Los datos fueron recolectados a través de cuestionarios. Algunos participantes presentaron conocimientos superficiales sobre las fibras dietéticas. El nutricionista es fundamental en las Unidades Básicas de Salud para fortalecer el acceso a la información.
DESCRIPTORES: Diabetes Mellitus; Estado Nutricional; Dieta Saludable; Fibras de la Dieta.

RESUMO

Este estudo avaliou o nível de conhecimento sobre Fibras Alimentares em indivíduos diabéticos. Trata-se de um estudo epidemiológico transversal. Os dados foram coletados através de questionários. Alguns participantes apresentaram conhecimentos superficiais sobre as fibras alimentares. O nutricionista é essencial nas Unidades Básicas de Saúde para fortalecer o acesso à informação.
DESCRITORES: Diabetes Mellitus; Estado Nutricional; Dieta Saudável; Fibras na Dieta.

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INTRODUCTION

Diabetes Mellitus (DM), have shown high prevalence and incidence in the population, it is estimated that in 2040, about 642 million people in the world will have the disease. [1] This consists of a metabolic disorder characterized by persistent hyperglycemia, resulting from the deficiency in the production of insulin or its action, or in both mechanisms. DM is classified into Diabetes Mellitus type 1 (DM1) of autoimmune etiology, Diabetes Mellitus type 2 (DM2) and Gestational Diabetes Mellitus. [2] Due to its chronic character, DM is an onerous condition for both patients and the health system. [3]

It is known that change in lifestyle is essential to prevent complications of DM, in addition to helping to promote adequate glycemic control. [4] Thus, the adoption of a healthy diet, specifically, meeting the dietary fiber (DF) recommendations can represent benefits for DM patients. The positive influence of DF on health determinants [5,6], how to maintain the intestinal microbiota [7,8] is increasingly consolidated, however, Brazil still maintains an inadequate consumption of this nutrient. [6]

The DF are a set of substances of plant origin resistant to the action of digestive enzymes in the human body, and can be considered complex carbohydrates, resistant to digestion and absorption. [9] These can be classified as soluble and insoluble. Soluble fibers (SF) dissolve in water and are not digested in the small intestine, these have beneficial effects in relation to blood glucose. Insoluble fibers (IF) have limited fermentation, helping to control satiety and weight. [10,5]

Adequate consumption of food sources of DF has good repercussions for the health of the individual, as they provide a healthy diet and can reduce the risk of certain diseases. [12] Thus, the World Health Organization (WHO) recommends a consumption of 27-40g/day, whereas the SBD recommends 14g/1.000g daily. [13] Glycemic control is the main focus in the management of DM, therefore, the techniques that prevent hyperglycemia become an important factor for the prevention of possible complications. [14]

> **The DF are a set of substances of plant origin resistant to the action of digestive enzymes in the human body, and can be considered complex carbohydrates, resistant to digestion and absorption.**

There are few studies in the literature that explore the degree of knowledge and clarification about dietary fiber consumption by the diabetic population. In this context, the present study aimed to assess the level of knowledge of diabetic individuals attending a Basic Health Unit about DF, in a district of Coroaci, Minas Gerais.

METHOD

This is an epidemiological cross-sectional study of an exploratory nature, carried out with attendees of the Family Health Strategy (ESF) of Conceição de Tronqueiras, district of Coroaci - MG. Thus, we sought to describe the level of knowledge about the benefits of dietary fiber and its main food sources. The study was carried out with 45 adults and elderly diabetics of both sexes, registered at the ESF, from March to April 2018. The research was approved by the Ethics Committee on Research in Human Beings at UFJF, under opinion 3.038838 and CAAE: 92489118.4.0000.5147. After accepting to participate, the individuals were instructed to sign the Informed Consent Form. Inclusion criteria were: individuals over eighteen years old with a diagnosis of type 1, 2 and gestational diabetes mellitus.

For sociodemographic, health and determination of knowledge about fiber consumption, an adapted questionnaire was used. [15,16,17] A percentage of correct answers was considered a value greater than 50%. In addition, an educational intervention in the form of a lecture was provided. A simplified qualitative Food Frequency Questionnaire was applied, containing foods separated by food group, referring to the last three months for registration. The frequency of consumption was classified as daily, monthly, two or three times a week, fortnightly, rarely or never. [17] The foods contained in the questionnaire were selected based on the Brazilian Food Composition Table 2011, according to the population's consumption reality. Consumption was converted into

an equivalent daily frequency (Daily = 1; 2 to 3 times a week = 0,35; biweekly= 0,06; monthly= 0,03; rare or never= 0) 19, obtaining the daily intake score for all foods.

In the anthropometric evaluation, weight, height, neck circumference (NC), waist circumference (WC), body mass index (BMI) and waist-to-stature ratio (WSR) were measured. For the measurement of NC, individuals were positioned erectly in the horizontal plane and the measurement was performed at the midpoint of the neck, with the anthropometric measuring tape, after that men with NC > 35 cm and women NC > 34 cm were classified as having high cardiovascular risk.

WC was measured in the narrowest region of the trunk or, when not apparent, at the midpoint between the last rib and the upper border of the iliac crest. 20 The cutoff point proposed by the WHO (2004) was used, where values equal to or greater than 94 cm and 80 cm represent an increased risk of metabolic complications for men and women, respectively. The WSR calculation was obtained through the ratio of waist circumference and height, where value> 0,5 was classified as high risk. [21]

BMI was calculated using weight and height, and adults were classified according to the WHO (<18,4 underweight, 18,5 to 24,9 strophic, 25,0 to 29,9 overweight and> 30,0 obesity). For the classification of elderly people, the values recommended by Lipschutz (1994) were used (22 kg/m² underweight, 22 to 27 kg/m² eutrophic and

above 27 kg/m² overweight).

The Mann Whitney test and the Kruskall Wallis test were used to compare the median frequency scores of daily consumption of fiber-based foods. Pearson's chi-square test was used to verify the factors associated with the degree of knowledge about fibers. The Mc Nemar test was used to compare the proportions of correct answers to the questions before and after the nutritional intervention. Values of $p<0.05$ were considered statistically significant. All analyzes were completed using SPSS version 20.0.

RESULTS

The study was carried out with 38

Table 1 - Information on diabetes mellitus		
Variáveis	**N**	**%**
DM 1	12	31,6
DM 2	25	65,8
Diabetes gestacional	1	2,6
Tratamento		
Dieta	4	10,5
Hipoglicemiante oral	25	65,8
Insulina	3	7,9
Hipoglicemiante oral + Insulina	6	15,8
Comorbidades		
HAS		
Não	6	16,2
Sim	31	83,8
Dislipidemia		
Não	30	81,1
Sim	7	18,9
Acompanhamento nutricional		
Sim	6	15,8
Não	32	84,2

Table 2 – Nutritional status and cardiometabolic risk.		
Variáveis	**N**	**%**
IMC		
Baixo peso	2	5,3
Eutrofia	20	52,6

Sobrepeso	12	31,6
Obeso grau I	3	7,9
Obeso grau II	1	2,6
Risco cardiometabólico segundo CC		
Adequado	11	28,9
Risco elevado	27	71,1
Risco cardiometabólico segundo RCE		
Menor risco	2	5,3
Alto risco	36	94,7
Classificação do risco cardiometabólico segundo CP		
Adequado	7	18,4
Risco elevado	31	81,6

Table 3 – Perception about food and fibers.

Variáveis	N	%
Já ouviram falar sobre a fibra		
Sim	22	57,9
Não	16	42,1
Souberam informar fonte de fibras		
Sabe	25	65,8
Não sabe	13	34,2
Número de acertos		
Não satisfatório (menor que 3)	17	44,7
Satisfatório (≥ 3)	21	55,3

Table 4 - Association tests

Variáveis	Total de acertos nas questões sobre FA (%)		Valor p*
	Não satisfatório	Satisfatório	
Sexo			**0,508**
Masculino	36,4	63,6	
Feminino	48,1	51,9	
Idade			**0,859**
Adulto	42,8	57,1	
Idoso	45,8	54,2	
Escolaridade			**0,299**
Ensino fundamental	52,6	47,4	
Ensino médio	37,5	62,5	
Ensino superior	0,0	100,0	

rate. Regarding physical activity, 62,8% were sedentary. As described in Table 1- 65,85% of the participants have DM2, with only 15,8% having undergone nutritional monitoring.

Regarding BMI, 52,6% of participants were eutrophic. Cardiometabolic risk, on the other hand, 71,1% was classified as high risk, 94,7% high risk and 81,6% high risk, according to WC, WSR and NC, respectively.

About the level of knowledge of DF (Table 3), 57,9% of patients said they had heard of DF, in addition, 65,8% knew how to cite foods that are sources of DF.

The results of verifying the relationship of factors associated with knowledge about dietary fiber are described in Table 4.

Table 5 shows that patients who receive nutritional monitoring have a higher median consumption of vegetables compared to the others.

diabetic individuals, 14 (36,8) % adults and 24 (63,2%) elderly. The average age of the studied group was 62,6 ± 15,4 years. 50% of the patients had primary education, 42,1% high school, 5,3% higher education and 2,6% were illite-

Analfabeto	100,0	0,0	
HAS			**0,715**
Sim	41,9	58,1	
Não	50,0	50,0	
Dislipidemia			**0,410**
Sim	40	60,0	
Não	57,1	42,9	
Tipo de Diabetes			**0,622**
DM2	44,0	56,0	
DM1	50,0	50,0	
Diabetes Gestacional	0,0	100,0	
Tratamento			**0,311**
Dieta	75,0	25,0	
Hipoglicemiante oral	36,0	64,0	
Insulina	33,3	66,7	
Hipoglicemiante oral + Insulina	66,7	33,3	
Consideram ter uma alimentação saudável			**0,968**
Sim	45,5	54,5	
Não	46,2	53,8	
Tempo de diagnóstico do diabetes			**0,492**
< 3 anos	38,9	61,1	
≥ 3 anos	50,0	50,0	

Table 6, on the other hand, compares the percentage of correct answers to questions about health and knowledge of DF, among diabetic patients before and after the intervention.

DISCUSSION

Of the 38 diabetics interviewed, 71,1% were female, a characteristic similar to other studies, where there is a greater predominance of females. [10;16] The predominance of elderly patients in the study can be justified by the increased prevalence of the disease in this group of individuals. [19]

Hypertension is commonly associated with diabetes and this characteristic is evident in this study, as 68,8% of the participants said they had the disease. It is known that cardiovascular diseases are the main cause of death in this population, representing an important public health problem. Therefore, the prevention of DM, the management of hyperglycemia and the prevention of its complications is a public health priority. [21]

Table 5 – Median and interquartile range of the daily consumption frequency score for food groups.

	score de frequência de consumo diário				
Variáveis	Cereais	Vegetais	Frutas	Leguminosas	Alimentos fonte de fibras (escore total)
Sexo					
Masculino	1,1(0,7-3,0)	1,6(1,2-3,1)	1,1(0,5-3,1)	1,0(1,0-1,0)	6,0(3,2-10,0)
Feminino	1,1(0,7-2,1)	2,1(1,3-2,8)	0,8(0,4-2,1)	1,0(1,0-1,0)	4,6(4,1-8,1)
Valor p*	0,809	0,961	0,541	0,506	0,859
Faixa etária					
Adulto	1,0(0,7-2,5)	1,4(0,8-2,3)	0,8(0,1-1,2)	1,0(1,0-1,0)	4,1(3,2-6,9)
Idoso	1,3(0,8-2,6)	2,2(1,5-3,0)	1,1(0,7-2,7)	1,0(1,0-1,0)	6,2(4,2-8,5)
Valor p*	0,477	0,058	0,109	0,842	0,077
Escolaridade					
Ensino médio	1,5(0,8-2,6)	1,8(1,1-3,0)	0,9(0,7-2,4)	1,0(1,0-1,0)	6,2(4,0-8,3)
Ensino superior	1,9(1,1-2,7)	2,9(2,8-3,1)	2,0(1,0-3,1)	1,0(1,0-1,0)	8,0(6,0-10,0)
Valor p**	0,529	0,281	0,422	0,960	0,419
Ocupação					
Dona de casa/ aposentado	1,1(0,8-2,4)	2,2(1,3-2,8)	0,9(0,4-2,4)	1,0(1,0-1,0)	4,7(4,1-8,3)
Trabalha	0,9(0,6-3,1)	1,5(1,0-2,9)	0,9(0,7-2,6)	1,0(1,0-1,0)	5,0(3,2-8,6)

Valor p*	0,674	0,575	0,826	0,652	0,631
Atividade física					
< 150 mi/ semana	1,5(0,6-2,6)	2,0(0,8-2,6)	1,4(0,5-2,7)	1,0(1,0-1,1)	4,2(4,0-9,3)
	1,1(0,7-3,2)	2,9(1,7-3,1)	2,1(0,6-3,1)	1,0(1,0-1,0)	7,2(4,3-10,5)
Valor p**	0,954	0,156	0,163	0,316	0,290
Tipo de diabetes					
Tipo 1 ou gestacional	1,1 (1,0-2,0)	1,8 (1,4-3,1)	0,8 (0,2-2,4)	1,0 (1,0-1,0)	4,6 (3,7-8,3)
Tipo 2	1,1 (0,7-2,6)	2,0 (1,2-2,8)	1,0 (0,5-2,4)	1,0 (1,0-1,0)	4,6 (4,0-7,7)
Valor p*	0,620	0,666	0,689	0,713	0,987
Tempo de diagnóstico					
<3 anos	1,1(0,7-1,5)	2,2(1,4-3,15)	1,2(0,2-2,5)	1,0(1,0-1,0)	5,2(3,9-8,2)
≥3 anos	1,8(0,7-2,7)	1,5(0,9-2,7)	0,8(0,7-2,1)	1,0(1,0-1,0)	4,7(3,9-8,4)
Valor p*	0,549	0,292	0,838	0,323	0,977
Acompanhamento nutricional					
Sim	2,0(0,9-2,7)	2,9(1,6-3,5)	1,8(1,1-2,6)	1,0(1,0-1,0)	8,5(4,5-9,7)
Não	1,1(0,7-2,4)	2,0(1,1-2,7)	0,8(0,4-2,0)	1,0(1,0-1,0)	4,4(3,7-7,4)
Valor p*	0,447	0,049	0,060	0,652	0,072
< 50% das questões	1,1(0,7-3,0)	1,5(1,0-2,6)	0,8(0,7-2,5)	1,0(1,0-1,0)	4,3(3,9-8,7)
≥ 50% das questões	1,1(0,7-2,3)	2,2(1,4-2,9)	1,0(0,4-2,4)	1,0(1,0-1,0)	6,0(3,9-8,3)
Valor p*	0,769	0,211	0,724	0,247	0,769

Note: Frequency score values for daily consumption presented as median and interquartile range (p25 - p75). * * Mann Whitney test. ** Kruskall Wall test

Table 6 – Percentage of correct answers on questions before and after the intervention.

Questões	% de Acertos		Valor p*
	Antes intervenção	Após intervenção	
1	65,0	75,0	0,727
2	60,0	95,0	0,016
3	50,0	90,0	0,021
4	35,0	95,0	<0,001
5	40,0	90,0	0,006
6	70,0	100,0	–
7	65,0	100,0	–
8	35,0	100,0	–

Despite the patients presenting themselves as eutrophic, the presence of cardiometabolic risk was verified through the variables of WC, WSR and NC. The increased NC is related to the increase in carotid fat. In this way, high fiber diets are an important component in the control of diabetes. Based on these findings, increasing the daily fiber intake by 15g to 35g may be a reasonable goal that is expected to reduce the risk of premature mortality in adults with diabetes. [23]

At the UBS where the study was conducted, there is no presence of a nutritionist. The nutritional guidance provided had a positive impact, as there was an increase in the number of correct answers in the questions, which demonstrates how the presence of the nutritionist is essential to assist in the treatment of diabetes.

The consumption of a diet with few sources of dietary fiber may be associated with socioeconomic, demographic conditions and educational level of individuals, since individuals with higher income and higher education level tend to consume more food sources of these nutrients. [24] In our study, we did not find this association, but it was found that patients who were followed up with the nutritionist had a higher consumption of vegetables compared to other patients. It was noted that 65,8% of those evaluated did not practice any type of physical activity, it is known, however, that physical exercise is considered an important factor for DM control, especially when associated with adequate nutrition. [25]

CONCLUSION

The level of knowledge about fibers and their benefits were insufficient in

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this audience, which influenced their low consumption. It was also noticed a positive correlation between nutritional monitoring and consumption of vegetables, which shows the importance of monitoring and assertive treatment, justified by the fact that the other variables studied were not related to the level of knowledge about fibers.

These factors demonstrate the importance of the presence of a nutritionist professional composing the multiprofessional teams in the Basic Health Units, since these will be able to help users to make adjustments in eating habits, as well as, to know and understand the function of the foods that can be used prevention and health management. ■

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