Influence of food insecurity in the quality of life of Brazilian type-2 diabetes patients

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Resumo

Objetivo: Verificar a influência da insegurança alimentar na qualidade de vida de pacientes com diabetes. Métodos: Estudo transversal, descritivo, baseado em questionários de insegurança alimentar e qualidade de vida (SF-36). Resultados: Participaram 149 pacientes com diabetes tipo 2. Verificou-se que 22,1% apresentavam insegurança alimentar com (6,0%) ou sem fome (16,1%), havendo relação destas últimas com ausência de um parceiro fixo, menor grau de instrução e nível sócio-econômico. Observou-se piora significativa da qualidade de vida em pacientes com insegurança alimentar em relação à capacidade funcional, aspectos físicos, aspectos emocionais, dor, vitalidade, aspectos sociais e saúde mental. Obesidade relacionou-se com piora dos aspectos emocionais e aspectos sociais; idade com aspectos físicos; uso de insulina com aspectos emocionais. Conclusão: A insegurança alimentar diminui drasticamente a qualidade de vida de pacientes diabéticos.

Descritores: Diabetes Mellitus Tipo 2; Alimentação; Nutrição em Saúde Pública

Abstract

Objective: To investigate the influence of food insecurity in the quality of life of patients with diabetes. Methods: Descriptive study based on questionnaires of food insecurity and quality of life (SF-36),. Results: 149 patients with type-2 diabetes participated in this study. 22.1% were found to have experienced food insecurity with (6.0%) or without hunger (16.1%) and that these aspects were associated with the absence of a partner and low levels of education. There was a statistically significant worsening of quality of life in patients with food insecurity with regard to physical functioning, vitality, emotional life, pain, social functioning and mental health. Obesity was related to the deterioration of emotional and social aspects; age with physical aspects; use of insulin with emotional aspects. Conclusion: Food insecurity dramatically decreases the quality of life of diabetes patients.

Key-words: Diabetes mellitus type 2; quality of life; eating habits; public health nutrition

Introduction

Diabetes mellitus can be described as a complex and multifactor metabolic disorder characterized by chronic hyperglycaemia with disturbances in carbohydrate, fat and protein metabolisms resulting from defects in insulin secretion, insulin action, or both. It is estimated that there are approximately 200 million people worldwide with diabetes, a figure that could reach 300 million by 2030, two thirds of which is in developing countries1. It already accounts for over 9% of all deaths in the adult population in the South and Central American region, and its prevalence is expected to increase by 65% in the next two decades, especially in Brazil, which is among the world's top 10 countries with the largest population afflicted by this disease2.

Type-2 diabetes is the most common form of diabetes and accounts for 90% of cases. Among the complications seen in patients with type-2 diabetes are cardiovascular diseases, neuropathy, stroke, nephropathy, eye complications, hearing loss, gastroparesis and peripheral arterial disease3. Its chronic nature, severity and complications make this disease an important public health problem, implying high costs for the public health service and loss of quality of life for patients. Multidisciplinary monitoring is essential as is the use of surveying instruments to ensure consistent quality of life to these patients4.

The measurement of quality of life of type 2 diabetic patients used to monitor treatment provides indicators of the changing status of patients regarding their disease, to identify subgroups of people whose health may be particularly affected5 and may also be used as an independent predictor of mortality6. However, research into the quality of life of patients, especially in populations with a socioeconomic and cultural profiles closer to the Brazilian reality are scarce, thus highlighting the need for these studies4.

Especially in developing countries, food insecurity has been recognized as one of the biggest problems, either through lack of food or living conditions that prevent the adequate utilization of available food7. Among patients with type-2 diabetes, food insecurity is a barrier to diabetes self-management8 and an independent risk factor for

poor glycemic control, which is a strong case for screening for food insecurity in these patients9. Surprisingly, few studies in Brazil seek to determine the prevalence and impact of food insecurity on different diseases, which is the aim of this study with diabetes mellitus type-2 patients.

Methods

This study has a descriptive, cross-sectional quantitative approach. The study sample consisted of adult patients diagnosed with type-2 diabetes, treated at a unit of the outpatient healthcare system in Brazil's Federal District.

Data collection was performed by means clinical data (sex, age, weight, height, comorbidities and treatment) and of three questionnaires: one for data on socioeconomic of patients with the following items: marital status, education, socioeconomic status (according to criteria set by the Brazilian Association of Studies and Research - ABEP). The body mass index (BMI) was calculated as the ratio between weight and squared height (kg/m2). From the BMI, individuals were classified as normal (18.5 to 24.9), overweight (25.0 to 29.9) and obese (≥ 30.0).

The second questionnaire was used to assess quality of life. The internationally standardized questionnaire SF-36 (Medical Outcomes Study 36-Item Short Form Health Survey) was employed. This questionnaire was developed by Ware and Sherbourne10 and translated into Portuguese by Ciconelli11. It has eight domains: Physical Functioning (CF), Physical (AF), Pain (DR), General Health (EGS), Vitality (VIT), Social Aspects (AS), Emotional Aspects (EA) and Mental Health (MH). In assessing the results scores are assigned on a scale of 0 to 100, where zero corresponds to the worst overall health status and 100 the best of health for each domain10.

The third instrument was used to check the food security of the patients12. The short form of the scale has six questions. Has food ever run out in your home and you didn't have the money to buy anymore? Can you afford to buy your family balanced meals that include rice, beans, meat, salads and fruit? Did you or someone else in your home

have to ever cut the size of your meals or skip meals because there wasn't enough money for food? How often did this happen: almost every month, some months but not every month, or in only 1 or 2 months? Have you ever eaten less than you felt you should because there wasn't enough money for food? Have you ever been hungry but didn't eat because there wasn't enough money for food? These questions generate a score ranging from 0 to 6. In four questions each positive answer corresponds to a point, while in one of the questions the point was given to a negative answer, while in another, the score corresponds to the time of exposure when there was a decrease in the amount of food for lack of money. A period above or equal to three months was equivalent to 1. Based on this questionnaire patients with scores 0-1 were defined as food secure (SEG), those whose scores were between 2-4 as insecure without hunger (INS) and patients who had scores 5-6 in their answers were insecure with hunger (IWH).

Organizations and tabulations of data were carried out in spreadsheets using Microsoft Excel®. Statistical analysis of these data was performed by the program Graph Pad Prism®, version 5.01. For the verification of possible factors influencing the quality of life of patients, such as food security, gender, age, marital status, obesity, hypertension, insulin use, we used the Student's t-test for age and analysis of variance (ANOVA) with post-Tukey test, all with a significance level of 5% ($p < 0.05$).

All participants signed an informed consent form and this study was authorized by the Committee for Research Ethics of the Foundation for Health Science Education and Research (FEPECS), of the Government of the Federal District (266/11).

Results

The present study included 149 patients with type-2 diabetes. Of these, 58 (38.9%) were male and 91 (61.1%) were female. Most patients were more than 60 years of age (50.4%) and had a steady partner (53.0%).

Regarding education, 62 (41.6%) patients had reached primary level, 62 (41.6%) secondary level and only 25 (16.8%) had higher education. None of the patients belonged to class A, only 13 (8.8%) to class B, 24 (16.2%) to C, 53 (35.5%) to class D and 59 (35.5%) belonged to social class E. Hypertension (74.5%), obesity (27.5%) and retinopathy (16.1%) were the concomitant diseases most commonly reported by patients. Treatment of 67.1% of the patients was conducted with oral hypoglycemic agents and 32.9 % with insulin.

Table 1 - Socioeconomic aspects of patients and their distribution in relation to Food Insecurity with Hunger (FIH), Food Insecurity without Hunger (ISF), Food Insecurity With and Without Hunger (FI) and Food Security (FS) of the outpatient healthcare system in Brazil's Federal District (n=149). *: p value observed among patients with FES X ICSF.

	FIH	FIWH	FI*	FS*	Total	p*
Sex: Man	3	9	12	46	58	0.08
Woman	(33.3)	(37.5)	(36.3)	(39.7)	(38.9)	
	6	15	21	70	91	
	(66.7)	(62.5)	(63.7)	(60.3)	(61.1)	
Age: 18-40 anos	3	5	8	15	23	
41-60 anos	(33.3)	(20.8)	(24.2)	(12.9)	(15.4)	0.10
> 60 anos	2	2 (8.3)	4	47	51	
	(22.2)	17	(12.1)	(40.5)	(34.2)	
	4	(70.9)	21	54	75	
	(44.5)		(63.7)	(46.6)	(50.4)	
Partner: Yes	3	11	14	65	79	**0.03***
No	(33.3)	(45.8)	(22.3)	(56.0)	(53.0)	
	6	13	19	51	70	
	(66.7)	(54.2)	(57.5)	(44.0)	(47.0)	
Education:	8	13	21	41	62	
Fundamental	(88.9)	(54.2)	(63.6)	(35.3)	(41.6)	**0.04***
Medium	1	11	12	50	62	
Superior	(11.1)	(45.8)	(35.4)	(43.1)	(41.6)	
	0 (0.0)	0 (0.0)	0 (0.0)	25	25	

				(21.6)	(16.8)	
Social Class: B	0	0	0	13	13	
C	(00.0)	(00.0)	(00.0)	(12.2)	(08.8)	**0.04***
D	1	0	1	23	24	
E	(22.2)	(00.0)	(03.0)	(21.7)	(16.2)	
	4	8	12	41	53	
	(44.4)	(33.3)	(36.4)	(38,7)	(35.5)	
	4	16	20	39	59	
	(44.4)	(66.7)	(60.6)	(27.4)	(39.5)	
Diseases:	5	15	21	90	111	
Hypertension	(55.6)	(62.5)	(91.3)	(60.4)	(74.5)	0.18
Obesity	1	6	7	34	41	
Retinopathy	(11.1)	(0.25)	(30.4)	(22.8)	(27.5)	
	2	4	6	18	24	
	(22.2)	(16.6)	(26.1)	(12.1)	(16.1)	
Treatment: Insulin	4	9	13	36	49	0.27
Oral	(44.4)	(37.5)	(36.4)	(24.1)	(32.9)	
Hypoglicemiant	5	15	20	80	100	
	(55.6)	(62.5)	(63.6)	(75.9)	(67.1)	

It was found that 22.1% of patients presenting food insecurity with (6.0%) or without hunger (16.1%). It was found that the absence of a steady partner (p = 0.03), lower education levels (p = 0.04) and lower social classes (p = 0.04) were related to increased food insecurity, which does not occur in relation to sex, age, concomitant disease or type of treatment (Table 1).

The highest scores of the SF-36 presented by patients with type-2 diabetes were social functioning (66.7) and pain (66.4), while the lowest were physical aspects (39.4) and emotional aspects (33.3).

Table 2 - Scores of the SF-36 quality of life parameters in relation to socio-epidemiological and clinical parameters of the outpatient healthcare system in Brazil's Federal District (n=149). FI: Food Insecurity; CF: Functional Capacity, PA: Physical Aspects; EA: Emotional

Aspects; PAI: Pain; GH: General Health, VIT: Vitality, SA; Social Aspects; MH: Mental Health.

	FC	FA	EA	PAI	GH	VIT	SA	MH
Total	55.6	39.4	33.3	66.4	48.2	57.0	66.7	47.3
FI With Hungry	42.2	16.7 21.9	11.1	61.1	48.9	42.2 49.0	47.2 50.5	36.4 35.3
FI Without Hungry	47.3	20.5 44.8	23.6	57.5	43.3	47.1 59.9	49.6 66.7	35.6 47.3
Food Insecurity*	45.9	**0,000 4**	20.2	58.5	44.8	**<0.0001**	**0.000 2**	**0.000 1**
Food Security*	58.4		37.1	68.6	49.1			
*p	**0.01**		**0.03**	**0.04**	0.07			
Sex: Men	52.9	41.3	36.2	70.6	48.8	58.0	65.0	46.2
Woman	57.3	38.1 0.36	31.5	63.5	47.7	56.4 0.74	61.5 0.37	43.8 0.42
p	0.30		0.29	0.08	0.40			
Age: 18-40	59.6	31.5	30.4	61.7	51.1	55.0	62.5	44.3
41-60		50.47				60.1	61.7	47.3
> 60	57.2	33.9	41.5	64.7	47.2	55.4	63.8	43.0
**p		**0.01**				0.20	0.88	0.32

	53.		28.	69.	47.			
Marital	9	37.5	3	0	9	58.1	64.6	46.6
status:	0.5	41.6	0.1	0.3	0.4	55.7	60.8	42.6
married	4	0.47	9	9	1	0.35	0.32	0.12
single	57.		30.	68.	48.			
p	8		8	0	4			
	53.		36.	64.	47.			
	1		2	5	8			
	0.2		0.4	0.3	0.7			
	8		2	9	5			
Hypertensio	55.	36.9	32.	66.	47.	56.8	63.1	45.3
n: Yes	6	47.2	7	2	4	57.8	62.2	43.0
	55.	0.14	35.	66.	50.	0.68	0.96	0.31
No	7		2	9	4			
p	0.8		0,7	0,8	0.2			
	1		1	7	5			
Obesity: Yes	53.	38.7	24.	64.	49.	57.2	57.9	46.4
No	2	39.9	7	5	4	56.9	66.5	43.5
p	57.	0.83	39.	67.	47.	0.93	**0.02**	0.28
	4		5	7	3			
	0.3		**0.0**	0.4	0.3			
	5		**3**	4	0			
Insulin: Yes	54.	38.8	26.	65.	48.	58.2	61.1	46.6
No	0	41.0	4	6	4	55.6	65.6	43.4
p	58.	0.71	43.	67.	48.	0.32	0.25	0.32
	0		7	5	0			
	0.3		**0.0**	0.6	0.8			
	8		**1**	4	2			

* Values obtained from the t test comparing the scores of individuals with Food Safety and Food Insecurity (with and without hunger). Values ** ANOVA with Tukey post-test.

A significant worsening of quality of life in patients with food insecurity was also found in relation to functional capacity (p = 0.01), physical aspects (p = 0.0004), emotional aspects (p = 0.03), Pain (p = 0.04), vitality (p <0.001), social functioning (p = 0.0002) and mental health (p = 0.0001). The main differences between patients with and without food insecurity occurred in relation to physical aspects (22.3) and social functioning (1.17) (Table 2).

Obesity was related to the worsening of emotional aspects (0.03) and social functioning (0.02), whereas physical aspects related to age (0.01) and insulin use to the emotional domain (p = 0.01). The variables that showed no significant difference in any domain of SF-36 were sex, marital status and presence of hypertension (Table 2).

Discussion

Diabetes has the propensity to impact the poorest and most vulnerable people in low-income countries, and imposes a heavy burden on socioeconomic development2. In the present study, the type-2 diabetes patients were mostly composed of women, who had steady partners, low family income and low education. These anthropometric and social aspects are similar to those found in other Brazilian diabetes patients13,14,15. Among the comorbidities most commonly reported by patients were hypertension, obesity, and retinopathy, which is consistent with the scientific literature on this disease3.

The low scores were physical aspects, social functioning and mental health. These findings are consistent with other studies that verify reduced quality of life in diabetes patients, especially in relation to concerns about the future effects of the disease and possible complications16.

It was found that 22.1% of patients reported food insecurity with (6.0%) or without hunger (16.1%). This prevalence is lower than verified in HIV/AIDS patients in Brasília-DF17, but was two times higher than that recorded in the urban population of the city of Pelotas-RS (11%) with an HDI and per capita income similar to those in the Federal

District, using the same assessment questionnaire18. Diabetes, complications and comorbidities may hinder or even prevent the access of certain patients to work, so that there is a higher prevalence of food insecurity in these patients compared to the general population.

The absence of a steady partner, lower education levels and lower social class were related to increased food insecurity. A study of type-1 diabetes patients in the state of Bahia found that the level of education showed no significant influence on the quality of life19. Low family income can impact directly and negatively on the quality of life of diabetes patients18 or indirectly, as seen in this study, increasing food insecurity. There were no statistically significant differences between subjects with and without hypertension in relation to quality of life. Similar results were observed in other studies with Brazilian patients11 and Chilean patients16, when diabetes patients with hypertension reported satisfactorily for overall quality of life. However, these studies did not check how long the patients had been diagnosed with hypertension, and whether they were clinically controlled or had any complications.

In type-2 diabetes food insecurity patients is associated with poorer psychological distress and physical health20. In the present study, patients with FI worse scores of quality of life domains, with seven of the eight domains with statistically significant values. The most affected aspects were physical and social, suggesting that food insecurity dramatically impacts these aspects in patients' lives. The multidisciplinary disease management program for patients with poorly controlled type-2 diabetes can improve both glycemic control and HR-QOL5.

Conclusion

This study found that, in isolation, food insecurity is a factor that dramatically decreases the quality of life of diabetes patients, and should be an important analysis factor to assess the quality of life of tipe-2 diabetes patients. Further studies should be

conducted to verify factors may interact with each other, leading to a diminished quality of life of these patients.

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