



ORIGINAL ARTICLE

Knowledge of Diabetes Mellitus: Does Gender Make a Difference?

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Received: June 6, 2014
Revised: June 24, 2014
Accepted: June 24, 2014

KEYWORDS:

Amazon,
diabetes mellitus,
health education,
women

Abstract

Objective: Diabetes mellitus (DM) is a chronic disease considered an important public health problem. In recent years, its prevalence has been exponentially rising in many developing countries. Chronic complications of DM are important causes of morbidity and mortality among patients, which impair their health and quality of life. Knowledge on disease prevention, etiology, and management is essential to deal with parents, patients, and caregivers. The aim of this study was to evaluate the knowledge regarding DM in an adult population from a Middle-western Brazilian city.

Methods: This was a cross-sectional study covering 178 adults, aged 18–64 years, who answered a diabetes knowledge questionnaire. In order to identify the difference between groups, analysis of variance was used.

Results: Higher knowledge scores were found regarding the role of sugars on DM causality, diabetic foot care, and the effects of DM on patients (blindness, impaired wound healing, and male sexual dysfunction). However, lower scores were found amongst types of DM, hyperglycemic symptoms, and normal blood glucose levels. Females tended to achieve better knowledge scores than males.

Conclusion: Women had better knowledge regarding types of DM, normal blood glucose values, and consequences of hyperglycemia revealed that diabetes education should be improved.

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1. Introduction

Prevalence of type 2 diabetes mellitus (DM) is increasing worldwide, especially among developing nations, and it has been estimated that by 2030, 366 million people will be affected by this disease, and two-thirds of which will be living in developing countries [1,2].

According to the American Diabetes Association, DM should be considered as a group of metabolic disorders characterized by a hyperglycemic state, as a result of chronic insulin resistance, which leads to pancreatic β cell dysfunction and subsequently a massive failure on insulin secretion. DM chronic hyperglycemia has been associated with long-term target-organ damage, dysfunction, and collapse especially among ophthalmologic, renal, neurologic, and cardiovascular systems [3].

It should be noted that type 2 DM is an independent risk factor for coronary artery disease, stroke, peripheral vascular disease, and congestive heart failure, and is the major cause of death for those patients [4–7].

Although the type 2 DM pathogenesis is still not fully elucidated, there are many contributing factors such as advanced age, familial history, and behavioral and environmental factors that develop a relevant role in disease prognosis and evolution [8–10].

In DM primary and secondary prevention strategies, the most important factors are population education and information, stronger information systems for patients, caregivers, and health professionals, as well as supportive environments for health promotion and disease prevention, healthy public policies, and adoption of structured healthy lifestyle intervention programs [11].

The aim of this study was to evaluate the diabetes knowledge of an adult population in the Araguaia region, Legal Amazon.

2. Materials and methods

2.1. Locality and population

The Bom Jardim de Goiás city is located in the northwest region of the Goiás. Its territory is limited by Aragarças, Baliza, Montes Claros, and Piranhas municipalities, which are to the Goianian side of the Araguaia region, Legal Amazon [12].

This municipality is 185,073 km² and its population is estimated to be 8,423 citizens with a very low demographic density (4.55/km²). This population includes Caucasian, AfroBrazilian, and indigenous people. Its geographic position is 16°12'36" latitude south and 52°10'19" longitude west, at an altitude of 318 m above sea level [12].

This cross-sectional study evaluated the knowledge of diabetes mellitus among 178 adults (age 18–64 years) from three family health units of Bom Jardim de

Goiás, located at the Goiás State in the Araguaian Valley, Amazônia Legal, Brazil. More detail regarding the studied population is presented in Table 1.

2.2. Evaluation of diabetes knowledge

To evaluate the knowledge of diabetes, a Portuguese version of the Star Country Diabetes Study's questionnaire was used [13]. The referred instrument has 24 items.

2.3. Ethical and statistical aspects

The volunteers signed an informed consent form prior to entering the study, which was approved by the Julio Müller University Hospital Ethics Committee on Research of the Federal University of Mato Grosso (protocol no. 668/CEP-HUJM/09).

Statistical analysis was done by the EpiTools program (Australian Centre for International Agricultural Research, Canberra, Australia). A variance analysis to compare two proportions was performed (ANOVA). Statistical significant differences were considered when $p < 0.05$.

3. Results

Among this population the majority of people was young or middle aged male gender, white Caucasian and AfroBrazilian, and were married with a low family income.

In general, the frequency of correct answers tended to be higher amongst women compared to men. However, statistical differences among gender were found only for

Table 1. Socioeconomic characteristics of a sample population from Bom Jardim de Goiás, Goiás, Brazil, 2013.

Variable	Categories	<i>N</i>	%
Gender	Female	70	39.32
	Male	108	60.68
Ethnicity	AfroBrazilian	77	43.26
	Caucasian	94	52.81
	Indigenous	7	3.93
Educational level	Illiterate	11	7.43
	Fundamental	97	54.49
	High school	74	41.57
	College	7	3.94
Marital status	Single	49	27.53
	Married	79	44.38
	Divorced	16	8.99
	Other	34	19.10
Age (y)	18–34	97	54.49
	34–59	63	35.39
	≥60	18	10.12
Family income (MS) ^a	≤1	87	48.87
	≥1–2	41	23.03
	>2	35	19.67
	Not answered	15	8.43

^aIn National base salaries/month (US\$296.00).

three questions: the types of DM, hyperglycemic symptoms, and normal blood glucose levels.

Lower scores of correct answers were found regarding the relationship among DM and cancer, hyperglycemic symptoms, normal blood glucose, the beneficial effect of exercise on glycemia, and the increased risk of heart disease among DM patients. Further results are shown in Table 2.

4. Discussion

It is well established that educational level is positively associated with disease knowledge. An Indian study in a rural area of Chennai reported that the higher the age, socioeconomic, and educational levels, the higher the DM knowledge of the population [14]. In general, DM knowledge of a population has a positive association with an education degree [15–17]. In the same regard, the European Prospective Investigation into Cancer and Nutrition (EPIC) cohort study with 340,234 persons from eight European nations observed an inverse association between DM risk and educational degree [18].

In the current study, the majority of the population had only primary education and 7.5% were illiterate, which at least in part explains the degree of knowledge of DM.

Concerning the current study, 49.1% of men and 64.3% of women had correct answers regarding blood glyceemic values and 52.3% reported that exercise can diminish blood sugar levels. A study by Al-Mahrooqi et al [19] of 541 high school children from Muscat,

Oman, found that 45% of them knew the normal blood glyceemic values and 60% of the students believe that exercise can decrease blood glyceemic values.

One study covering 81 Brazilian patients revealed that only 31% knew that this disease can cause sexual dysfunction or kidney problems; only one third associated DM with circulatory disorders and 47.6% with blindness [16].

A Brazilian study in Ribeirão Preto, SP, Brazil with 82 diabetes mellitus patients reported that 78% of them had sufficient information regarding the disease [17]. Covering the general population the present study reported 57.6% of the population had knowledge regarding the disease.

In another Brazilian study in São Paulo, SP, the most affluent Brazilian metropolitan area, covering 357 DM patients of a public health state hospital 53.2% did not know their disease type [20]. In the same study, the lack of knowledge of DM comorbidities was 36.7% for heart disease, 30.5% for stroke, 18.8% for circulatory disorders, 17.1% for kidney disorders, and 98% for blindness.

In the current study, 85.4% of people known that an unhealthy diet is a risk factor for DM. This result is similar to that reported by a population-based study in Pelotas, RS, South Brazil [21]. In an Indian study in Agartala with 200 mothers, only 39.5% knew that an unhealthy diet has a causative role in DM [22].

Another report from Gujarat, India, regarding knowledge of DM among 238 patients the correct answers for diagnosis, heritability, risk factors were 82.77%, 57.98%, and 17.64%, respectively [23]. Compared with the present study, the Gujarat population

Table 2. Adequate knowledge (%) on diabetes mellitus (DM) of Bom Jardim de Goiás, Goiás, Brazil population, 2013.

Question	Female (n, %)		Male (n, %)		Total (n, %)	
Normal blood glucose values	45	64.28*	53	49.07	98	55.05
Glucose testing could be performed from a blood or urine sample	53	75.71	67	62.04	120	67.41
Thirsty, tiredness, and weakness means a higher blood sugar	38	54.28*	41	37.96	79	44.38
What is the effect of exercise on blood glucose of a DM patient?	42	60.00	51	47.22	93	52.25
DM causes heart problems	41	58.57	58	53.70	99	55.62
DM causes cancer	22	31.43	37	34.26	59	33.15
DM causes blindness	61	87.14	85	78.70	146	82.02
DM can cause renal failure	45	64.28	74	68.52	119	66.85
DM causes male sexual dysfunction	58	82.86	85	78.70	143	80.34
How many kinds of DM exist?	38	54.28*	38	35.18	76	42.70
Kidneys produce insulin	27	38.57	39	36.11	66	37.10
DM patients should carefully excise the toe nails	52	74.28	75	69.44	127	71.35
DM patients have slowing healing of wounds and bruises	64	91.43	92	85.18	156	87.64
DM induces poor circulation	48	68.57	73	67.60	121	68.00
Excessive dietary intake of sweets and candy can lead to DM	59	84.28	93	86.11	152	85.39

* $p < 0.05$.

had higher knowledge regarding adequate diagnostic methods, whereas >85% knew the dietary risk factors.

Many studies conducted in very diverse populations have shown that girls and women performed better than boys and men regarding knowledge on DM [19,21,22,24,25]. The present study also confirmed that the female gender had higher DM knowledge scores than the males. Twenty years ago, an Ethiopian study did not observe significant gender differences on DM knowledge [26].

In respect of type 2 DM prevention and treatment, a recent population-based study covering 3450 participants aged from 15 years to 64 years in Mongolia observed interesting findings. Although the role of diet received 63.4% of adequate knowledge, only 26.9% and 20.1% of people knew that exercise and weight loss are key factors in prevention and treatment of type 2 DM [25].

In both primary and secondary prevention of DM, education and information are key factors for successful public health public policies [11].

In this respect Herman and Zimmet [27] emphasized that type 2 DM is a global epidemic pathology and school education about DM should receive priority especially among the most populated nations. It should also be emphasized that DM education is also essential in improving patients' attitudes, lifestyle changes and adequate therapy adhesion [28].

In conclusion, this population of an inner town of central–western Brazil lacked knowledge regarding some aspects of DM, especially men who had lower knowledge compared to the women.

Conflicts of interest

All contributing authors declare no conflicts of interest.

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