

Nutritional Profile of People with Diabetes Type 2 Attended on the Integrated Health Care Clinic of UNA University Center - Belo Horizonte

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Abstract

The objective of this descriptive study, with a cross-sectional design, was to evaluate the nutritional profile of people with type 2 diabetes mellitus treated at the Integrated Health Care Clinic of UNA University Center, Belo Horizonte, Brazil. Data were collected from medical records of people with type 2 diabetes mellitus, seen at the clinic, in the second half of 2017, including 29 people, 79.3% of whom were female. There was a predominance of elderly people, mean age of 58.7 ± 14.3 years, 34.5% single and 38% married, average family income of R \$ 2,258.66 \pm R \$ 1,346, 56, 48.3% hypertensive, 89.7% non-smokers; 41.4% consumed alcoholic beverages; 75.9% sedentary, 79.3% obese, 75.9% with a degree of cardiovascular risk associated with the waist circumference measures found. The classification of very high cardiovascular risk prevailed in both sexes, 86.4% female and 71.4% male. All women had high waist circumference. 91.3% of people who do not practice physical activity had cardiovascular risk. The studied group had a high prevalence of obesity and physical inactivity, with a very high number of people at cardiovascular risk among women and those who were sedentary. Strategies that aim to change these conditions, integrating multidisciplinary teams are essential for the prevention and control of complications related to this disease, in addition, when carrying out nutritional planning, it must be individualized and these conditions need to be considered in its elaboration.

Keywords: *Type 2 Diabetes Mellitus; Epidemiological Profile; Obesity; Chronic Disease; Nutrition*

Introduction

Type 2 Diabetes mellitus (DM2) is one of the most prevalent Chronic Noncommunicable Diseases (NCDs) in the world, resulting from changes in production, secretion and the mechanism of action of insulin, which is characterized by chronic hyperglycemia with disturbances in carbohydrate, lipids and proteins metabolism. DM2 is more common than type 1, covering about 90% of diabetes cases [1].

The worldwide prevalence of DM2 almost doubled between 1980 and 2014, from 4.7% to 8.5% in the adult population. These numbers are believed to reflect an increase in associated risk factors, such as being overweight or obese [2].

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Brazil ranks fourth among the countries with the highest number of diabetics, about 14.3 million in 2015, according to a study carried out by the International Diabetes Federation [3]. In 2013, a National Health Survey conducted by the Brazilian Institute of Geography and Statistics (IBGE) and the Ministry of Health concluded that 6.2% of the Brazilian population aged 18 years or older reported having DM2 [4]. The higher prevalence of DM2 in Brazil has been associated with increased rates of overweight and obesity related to lifestyle changes such as: eating habits and physical inactivity. Changes in the food intake of the Brazilian population, such as the low consumption of fiber-rich foods, an increase in the proportion of saturated fats and simple carbohydrates in the diet, associated with physical inactivity are considered to be causal factors of obesity. Other chronic diseases, population aging and family history of diabetes are also added [5,6].

In addition, DM2 is related to high social and economic costs, both for the individual and for society. Its costs are mainly related to a high frequency of acute and chronic complications, such as renal, ophthalmic, neurological, circulatory and peripheral causes of hospitalizations, disabilities, loss of life productivity and premature death, negatively influencing their quality of life people and burdening health system spending.

The knowledge of this population allows the planning and application of general strategies more appropriate for a better control and treatment of the disease. From this study it is possible to establish health care planning and more effective educational activities aimed at this audience.

Objective of the Study

Given the context presented, the objective of this study is to assess the nutritional profile of people with DM2 treated at the Integrated Clinic for Health Care of UNA University Center, Belo Horizonte, Brazil.

Methods

This is a descriptive study, with a cross-sectional design, carried out through data collection in records of the first consultation of the medical records of patients with DM2, at the Integrated Clinic of Health Care at Centro Universitário UNA, Belo Horizonte, Brazil

The inclusion criteria were patients with a diagnosis of DM2 who underwent nutritional consultations at the clinic in the second half of 2017 and the exclusion criteria were patients who did not present the complete records of the variables under study, or who did not have DM2.

The study was initiated after approval by the Research Ethics Committee of UNA University Center under the number CAAE 67531517.2.0000.5098 and the Free and Informed Consent Term was waived because it was secondary data.

The patient profile was built from the collection of data in the medical records of these people, referring to the first consultation at the clinic. Socio-demographic data (gender, age group, family income, marital status), anthropometric data (weight, height, waist circumference - WC), lifestyle (smoking, drinking, physical activity, comorbidities) were considered.

The age classification was performed, dividing the sample into people under 30 years old, adults aged 30 to 59 years and elderly people aged 60 years or over.

Body weight and height were measured using Welmy® brand platform scales with a maximum capacity of 150 kg and a scale of 100g, following the standards adopted by WHO [7].

Based on weight and height, the body mass index (BMI) was calculated using the WHO criteria [8] for adults of both sexes, considering Thinness grade III BMI < 16 Kg/m², Grade II BMI 16 to 16, 9 Kg/m², Grade I BMI 17 Kg/m² to 18.4 Kg/m²; Eutrophy BMI 18.5 to 24.9 Kg/

m², Pre-obesity BMI 25 to 29.9 Kg/m²; Obesity Grade I BMI 30 to 34.9 Kg/m², Grade II BMI 35 to 39.9 Kg/m² and Grade III BMI > 40 Kg/m² except for the elderly, the BMI classification according to Lipschitz [9] was used, being considered Low weight BMI < 22 Kg/m², Eutrophy 22 to 27 Kg/m² and Obesity > 27.0 Kg/m².

The WC was measured with an inelastic tape positioned at the midpoint between the upper part of the iliac crest and the lower part of the last costal arch according to WHO recommendations. The classification of WC used for males is at high risk for cardiovascular disease if WC ≥ 94 cm and very high risk for cardiovascular diseases if WC ≥ 102 cm and for females WC ≥ 80 cm and WC ≥ 88 cm and respective risk classifications [10].

The variables related to lifestyle: smoking, drinking and physical activity were collected from data reported in the anamnesis.

Quantitative data analysis was performed using Excel 2010 software from Microsoft Corporation.

Results

The total number of nutritional consultations carried out in the second half of 2017 was 940, of which 36 people attended (3.83%) had a diagnosis of diabetes and 29 people reported having DM2 (82.9%).

After applying the inclusion and exclusion criteria, these 29 individuals were kept eligible for the study.

The sociodemographic characteristics, comorbidities, smoking, drinking and practice of activities of the patients included in the study are shown in table 1.

| Variables | n | % |
|--------------------------------------|----------|----------|
| Gender | | |
| Female | 23 | 79.3 |
| Male | 6 | 20.7 |
| Age range (years) | | |
| ≤ 30 | 1 | 3.5 |
| 31 - 59 | 13 | 44.8 |
| 60 or more | 15 | 51.7 |
| Average = 58.7±14.3 years | | |
| Marital status | | |
| Single | 10 | 34.5 |
| Married | 11 | 38.0 |
| Divorced | 5 | 17.2 |
| Widow | 3 | 10.3 |
| Family Income | | |
| < R\$ 1000.00 | 6 | 20.7 |
| R\$ 1000.00 - R\$ 2000.00 | 9 | 31.0 |
| R\$ 2001.00 - R\$ 3000.00 | 8 | 27.6 |
| > R\$ 3000.00 | 6 | 20.7 |
| Average = R\$ 2.258.56 ± R\$ 1346.56 | | |

| | | |
|--------------------------------------|----|------|
| Arterial hypertension | | |
| Yes | 14 | 48.3 |
| No | 15 | 51.7 |
| Other Pathologies | | |
| | 8 | 27.6 |
| Smoke | | |
| Yes | 3 | 10.3 |
| No | 26 | 89.7 |
| Alcoholism | | |
| Yes | 12 | 41.4 |
| No | 17 | 58.6 |
| Practice of Physical Activity | | |
| Yes | 7 | 24.1 |
| No | 22 | 75.9 |

Table 1: Sociodemographic characteristics, comorbidities, smoking, drinking and physical activity in people with type 2 diabetes mellitus, seen at the Integrated Health Care Clinic of UNA University Center, Belo Horizonte, MG, 2019.

Related to gender, there was a greater number of visits by women. The disease was reported predominantly by adults over 30 years old and the elderly. Only one teenager was attended to, all other visits were to adults over 30 years old or elderly. The marital status of single and married both predominated.

When assessing the family monthly income, it was found that 20.7% received income below R\$ 1.000.00, 31% received income from R\$ 1.000.00 to R\$ 2.000.00, 27.6% of R\$ 2.001.00 to R\$ 3.000.00 and also 20.7% received family income over R\$ 3.000.00. There was a greater concentration of people in the middle income brackets. The average family income of the group was R\$ 2,258.66 ± R\$ 1,346.56.

All people in the sample had some comorbidity, with a predominance of systemic arterial hypertension (SAH) in 14 individuals (48.3%). The sample revealed that 3 people (10.3%) were smokers and 20 people (89.7%) were non-smokers, 12 people (41.4%) reported drinking alcohol and 17 (58.6%) reported being abstainers.

Regarding the practice of physical activity, there was a high prevalence of physical inactivity, with 22 people (75.9%) not practicing any physical activity and 7 people (24.1%) practicing some type of physical activity.

It was found that 23 of the 29 patients had some degree of obesity, equivalent to 79.3% of the sample. The mean BMI of the total group was 33.5 ± 6.4 Kg/m² (Table 2).

| Variables | n | % |
|-------------------|----|------|
| Teenager | | |
| Obesity | 1 | 3.5 |
| Adults | | |
| Thinness grade II | 1 | 3.5 |
| Thinness grade I | 0 | 0 |
| Eutrophy | 1 | 3.5 |
| Pre-obesity | 2 | 6.9 |
| Obesity grade I | 5 | 17.0 |
| Obesity grade II | 3 | 10.3 |
| Obesity grade III | 1 | 3.5 |
| Elderly | | |
| Low weight | 1 | 3.5 |
| Eutrophy | 1 | 3.5 |
| Obesity | 13 | 44.8 |
| Total | 29 | 100% |

Table 2: Anthropometric profile by body mass index according to age group in people with type 2 diabetes, seen on an outpatient basis, Belo Horizonte, Brazil, 2019.

There was also a high prevalence of abdominal obesity, 75.9% of the group had a cardiovascular risk classification associated with the WC measures found, and the very high risk classification prevailed in both sexes. All women in the sample had elevated WC. The mean WC found in the group was 103.7 ± 14.2 cm as shown in table 3.

| Cardiovascular Risk | Female | | Male | |
|---------------------|--------|------|------|------|
| | n | % | N | % |
| No Risk | | | 2 | 28.6 |
| High Risk | 3 | 13.6 | | |
| Very High Risk | 19 | 86.4 | 5 | 71.4 |

Table 3: Cardiovascular risk according to waist circumference according to sex in people with type 2 diabetes, seen at the integrated health care clinic of UNA University Center, Belo Horizonte, Brazil, 2019.

The association of the classification of cardiovascular risk with the variable of physical activity revealed a very high number of people who did not practice physical activity (91.3%) and had cardiovascular risk, as shown in table 4.

| Cardiovascular Risk | Practice PA | | Don't practice PA | |
|---------------------|-------------|------|-------------------|------|
| | N | % | N | % |
| No Risk | 0 | 0 | 2 | 6.9 |
| High Risk | 0 | 0 | 3 | 10.4 |
| Very High Risk | 6 | 20.7 | 18 | 62.0 |

Table 4: Cardiovascular risk relationship and physical activity practice in people with type 2 diabetes, seen at the Integrated health care clinic at UNA University Center, Belo Horizonte, Brazil, 2019.
PA: Physical Activity.

Discussion

This study showed a high prevalence of obesity, increased WC, SAH, physical inactivity in people with DM2. The association of these factors with DM2 increases the risk of complications of this disease, amplifies the morbidity and mortality of this population, increasing the frequency of hospital admissions and health costs, also burdening the family budget for treating the disease [6,11,12].

Thus, studies on the nutritional profile of people with DM2 can contribute to the implementation of preventive measures and better control of the disease.

The analysis of the profile of this public, found that women were the ones who most sought care (79.3%), a similar result found in other studies. It is believed that, by having continuous functions with jobs that provide more flexible hours, women often access health services. There is more interest and less fear on the part of women to seek help in the prevention or treatment of their illnesses [13,14].

It was observed that the sample is predominantly composed of adults and the elderly (96.6%), similar to that found in other studies that claim the highest incidence of the disease occurs between 30 and 69 years, and that there is a high frequency of late diagnoses in old age, increasing the risk of cardiovascular complications [5,14,15].

In addition to not having major differences in the predominance of marital status, no evidence was found in other studies of the correlation between marital status and DM2.

The association between low income and the occurrence of DM2 was also not found a result corresponding to that revealed in other studies [16,17]. However, there are studies in the literature that discuss the importance of having an adequate income for the follow-up of nutritional planning by the patient and relate low income to diagnosis and control of the disease hampered by difficult access to health services [11,18].

The most prevalent comorbidity was SAH present in 48.3%, however in other studies higher values were found - Bobek, *et al.* [19] found 72.8% and Garcia, *et al.* [20] 72.9%. This result can be justified by the fact that the presence of SAH was detected by self-referral and many patients are unaware of the condition of hypertension. Even so, there is a lot of research that reinforces that the prevalence of SAH in people with DM2 is high and consequently the presence of SAH can be considered a risk factor for common cardiovascular complications in DM2 [14,21].

Smoking is considered a risk factor for the development of DM2. Research indicates that the relationship between smoking and diabetes is due to the fact that tobacco seems to be associated with the promotion of central obesity, with an increase in plasma cortisol concentrations in smokers, as well as with an increase in inflammatory markers and oxidative stress. caused by smoking. And it is still known that nicotine can also bind to nicotinic receptors in pancreatic cells and, thus, directly reduce insulin secretion [4]. In Brazil, due to the intensification of the Tobacco Control Program promoted by the Brazilian government, smoking has significantly decreased (it was 34.8% in 1989), which could be detected by the Surveillance of Risk and Protection Factors for Chronic Diseases Survey by Telephone Survey - VIGITEL, in which 10.2% of respondents in Brazil were smokers and in Belo Horizonte 15.3%, results close to those found in the present study (10.3%).

The moderate intake of alcoholic beverages is not widely accepted in the world. In Brazil, the standard dose measurement corresponding to approximately 10 - 12 grams of ethanol/day (equivalent to a 330 ml beer can, or a 100 ml wine glass, or a 30 ml of distilled drink) as a limit for non-harmful intake. There are studies that indicate benefits of moderate alcohol consumption for people with DM2, however the mechanisms of action are not well established, it is suspected that it is related to the decrease in glucose intolerance and also in the resistance to the action of insulin [23]. Data obtained by VIGITEL [22] refer that 15.3% of the population investigated in Belo Horizonte drink moderately. In the study group, although 12 people (41.4%) reported alcohol consumption, only one of these people could be considered as a person who makes excessive use of alcohol, according to information found in the medical records. The other 11 people reported low frequency use and there is no record of the amount ingested to infer harmful or abusive use.

Regarding the practice of physical activity, the results found are superior (75.9%) to those found in VIGITEL [22] for the population of Belo Horizonte (47.6%). This factor has a negative impact on the control of DM2, since studies in the literature show that obese and sedentary people are twice as likely to develop DM2 when compared to those who did not have such characteristics. In addition, increased physical activity and weight control have been associated with decreased peripheral insulin resistance, thus reducing the possibility of having DM2, being beneficial for disease prevention and control [6,11].

The high prevalence of obesity found in the group corresponds to results found in other studies conducted in Rio de Janeiro [24] and Pernambuco [14], respectively 70% and 60.7%. It is known that obesity has been considered one of the main risk factors for DM2 and is directly linked to the increase in BMI. Increasing weight worsens the response of pancreatic beta cells to glucose, causing a decrease in insulin release and an increase in insulin resistance. For this reason, studies are unanimous in affirming the need for weight control in the management of DM2 [25].

Studies indicate an association between WC and changes in cardiovascular metabolism, mainly related to the lipid profile, fasting glucose and insulin resistance [26]. WC is considered the best indicator of visceral obesity, being strongly related to atherosclerotic car-

diovascular diseases [27]. Therefore, abdominal obesity is a strong risk factor for chronic non-communicable diseases such as DM2 and cardiovascular diseases [28]. The present study found a high prevalence of increased WC, predicting cardiovascular risk, especially among women, with a very high risk classification (86.4%). Silveira [28] and Barazetti, *et al.* [29] also found a high prevalence of altered WC among patients with DM2, with a predominance of women, 65.8% and 74% respectively.

Studies highlight the association between measures of WC, cardiovascular risk and physical practice. It also points out, as in this study, a high frequency of cardiovascular risk among sedentary people [25,30].

Conclusion

The studied group of people with DM2 treated at the Integrated Health Care Clinic of UNA University Center, Belo Horizonte, Brazil showed a high prevalence of obesity and physical inactivity with cardiovascular risk, especially among women and sedentary people. Strategies aimed at changing these conditions, integrating multidisciplinary teams with interdisciplinary approaches are essential to prevent and control complications related to this disease. In addition, when carrying out nutritional planning, it must be individualized and these conditions need to be considered in its preparation.

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