

Analysis of the Clinical Profile of People with Type 2 Diabetes: Cross-sectional Study

Análise do Perfil Clínico de Pessoas com Diabetes Tipo 2: Estudo Transversal

Análisis del Perfil Clínico de Personas con Diabetes Tipo 2: Estudio Cruzado

RESUMO

Objetivo: Analisar o perfil clínico de pessoas com diabetes tipo 2. **Método:** Estudo transversal, observacional e quantitativo, realizado entre agosto e dezembro de 2019 em uma cidade litorânea do Piauí. Foram incluídos no estudo adultos com diabetes tipo 2 diagnosticados há pelo menos seis meses e acompanhados por Unidades Básicas de Saúde. Os dados foram analisados por meio de estatísticas descritivas e inferenciais, utilizando o software JAMOVI. O estudo foi aprovado pelo Comitê de Ética em Pesquisa, conforme Parecer nº 3.447.415.

Resultados: Dos 160 participantes, 66,8% eram mulheres com idade média de 61,6 anos. A maioria apresentava histórico familiar de diabetes (67,5%) e fazia uso de Metformina (42,5%). Apesar de 55% terem recebido educação sobre a condição, 38,1% nunca haviam sido orientados, e 67,5% eram sedentários. **Conclusão:** O estudo destaca diferenças de gênero e a necessidade de monitoramento contínuo, educação efetiva e abordagem multiprofissional.

DESCRIPTORIOS: Atenção primária à saúde; Diabetes mellitus tipo 2; Perfil de saúde.

ABSTRACT

Objective: To analyze the clinical profile of people with type 2 diabetes. **Method:** Cross-sectional, observational, and quantitative study, carried out between August and December 2019 in a coastal city in Piauí. The study included adults with type 2 diabetes diagnosed for at least six months and followed by Basic Health Units. Data were analyzed through descriptive and inferential statistics, using the JAMOVI software. The study was approved by the Research Ethics Committee, according to Opinion No. 3,447,415. **Results:** Of the 160 participants, 66.8% were women with a mean age of 61.6 years. Most had a family history of diabetes (67.5%) and used Metformin (42.5%). Although 55% had received education about the condition, 38.1% had never received guidance, and 67.5% were sedentary. **Conclusion:** The study highlights gender differences and the need for continuous monitoring, effective education and a multidisciplinary approach.

DESCRIPTORS: Primary health care; Type 2 diabetes mellitus; Health profile.

RESUMEN

Objetivo: Analizar el perfil clínico de las personas con diabetes tipo 2. **Método:** Estudio transversal, observacional y cuantitativo, realizado entre agosto y diciembre de 2019 en una ciudad costera de Piauí. Se incluyeron en el estudio adultos con diabetes tipo 2 diagnosticados hace al menos seis meses y acompañados por Unidades Básicas de Salud. Los datos fueron analizados mediante estadística descriptiva e inferencial, utilizando el software JAMOVI. El estudio fue aprobado por el Comité de Ética en Investigación, según Dictamen N° 3.447.415. **Resultados:** De los 160 participantes, el 66,8% eran mujeres con una edad promedio de 61,6 años. La mayoría tenía antecedentes familiares de diabetes (67,5%) y utilizaba Metformina (42,5%). Aunque el 55% había recibido educación sobre la afección, el 38,1% nunca había recibido educación y el 67,5% eran sedentarios. **Conclusión:** El estudio destaca las diferencias de género y la necesidad de un seguimiento continuo, una educación eficaz y un enfoque multidisciplinario.

DESCRIPTORIOS: Atención primaria de salud; Diabetes mellitus tipo 2; Perfil de salud.

RECEIVED: 03/31/2025 APPROVED: 04/15/2025

How to cite this article: Cruz JMS, Oliveira GB, Alves GL, Pacheco ES, Penha JC, Almeida VO, Araújo MFM, Neto JCGL. Analysis of the Clinical Profile of People with Type 2 Diabetes: Cross-sectional Study. *Saúde Coletiva* (Edição Brasileira) [Internet]. 2025 [acesso ano mês dia];15(95):15626-15641. Disponível em: DOI: 10.36489/saudecoletiva.2025v15i95p15626-15641

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INTRODUCTION

Diabetes Mellitus (DM), a multifactorial metabolic disorder closely associated with adiposity accumulation and unfavorable lifestyle behaviors, represents a serious public health problem on a global scale. Currently, more than 536.6 million people between the ages of 20 and 79 live with the disease worldwide, 15.7 million of whom live in Brazil.⁽¹⁻²⁾

Among the most prevalent complications of DM, micro and macrovascular alterations stand out, in addition to episodes of hypo and hyperglycemia, which contribute significantly to the increase in hospitalizations and health care costs.⁽²⁾ In Brazil, total expenses associated with the treatment of people with DM already exceed 42 million dollars annually.⁽¹⁾ Given this scenario, it is essential to understand the clinical

profile of individuals affected by the disease in order to support more assertive health care strategies.

Patients with DM often have high Body Mass Index (BMI), particularly among females, as well as inadequate glycemic control.⁽³⁾ Although adherence to pharmacological treatment is a common and well-accepted practice among patients with DM, lifestyle changes are crucial for effective management of the disease.⁽³⁻⁴⁾

Regarding gender differences, while hormonal changes and reproductive factors make women more vulnerable, especially during menopause, the literature indicates that men have greater clinical severity at diagnosis, in addition to a higher prevalence of hospitalizations and mortality related to DM.⁽⁵⁻⁶⁾ However, women often face more severe cardiovascular complications, even after brief exposure to diabetes,

such as during pregnancy, which highlights the importance of continuous monitoring in this population.⁽⁶⁻⁷⁾

In this context, the creation and improvement of technologies and interventions aimed at people with DM, including actions that promote self-care, multidisciplinary work, and clinical monitoring, are essential to reduce complications and improve health outcomes. Thus, the present study aimed to analyze the clinical profile of people with type 2 diabetes.

METHOD

This is a cross-sectional, observational, and quantitative study conducted between August and December 2019 in a coastal city in the state of Piauí, in the Northeast region of Brazil. The study is part of a larger project entitled "Analysis of the effectiveness

of cinnamon in reducing glycemic levels in patients with type 2 Diabetes Mellitus.”

The study included people aged between 18 and 80 years, diagnosed with type 2 Diabetes Mellitus (DM2) for at least six months, monitored by the Family Health Strategy in Basic Health Units (UBS) in the urban area of the city, and using oral antidiabetics. People using insulin, pregnant women, and those with serious health complications (e.g., cardiovascular disease, cancer, liver disease, or kidney disease) were excluded.

The sample consisted of 160 participants, selected from five UBS, considering the number of patients with DM2 registered in each unit. To establish the statistical power, a post hoc analysis was performed using a statistical equation based on the mean difference in triglycerides between groups and type I (0.05) and type II (0.2) error parameters. A statistical power of 95.4% was identified to detect significant differences between the groups, considering the sample of 160 participants.

The number of participating UBS was determined based on the number of patients with type 2 Diabetes Mellitus (DM2) followed in each of them. After the UBS were drawn, the units were visited according to the defined order, aiming to reach the minimum calculated sample. For example, if UBS “A”, the first drawn, included only 30 participants, UBS “B”, the second drawn, would be considered, and so on, until the final sample was obtained.

Participants were recruited by community health agents, who distributed invitation letters containing information about the study, as well as instructions to attend the study on an empty stomach and to wear light clothing. Of the 250 patients initially recruited, 160 met the eligibility criteria and were included in the final sample.

On the scheduled days, participants

signed two copies of the Free and Informed Consent Form (FICF) after receiving detailed information about the study. They then answered a questionnaire about socioeconomic and clinical data, including age, sex, education, income, marital status, alcohol and tobacco use, medications in use, and time since diagnosis.

Anthropometric data (weight, height, waist, neck, thigh and abdomen circumferences) were then collected and three blood pressure measurements were taken. The average length of stay for each participant was one hour.

The data were analyzed descriptively, using measures of central tendency and dispersion (mean, standard deviation, absolute and relative frequency). All analyses were conducted using the JAMOVI software. The study was approved by the Human Research Ethics Committee, under opinion No. 3,447,415, in accordance with the guidelines and standards for research involving human beings of the National Health Council.

RESULTS

Of the 160 participants in this study, the majority were female (66.8%), with a mean age of 61.6 years ($SD \pm 11.2$), and self-declared brown skin color (56.3%). Regarding education, the mean was seven years of study ($SD = 4.44$), and half of the sample had only completed elementary school (50%). More than half of the participants were retired (50.6%), with a mean income of R\$1,988.00 ($SD \pm 1,431.00$), married or in a stable union (65.6%), and lived with their family (66.9%).

Regarding clinical data related to diabetes (Table 1), the majority of participants had a family history of diabetes (67.5%) and a medical diagnosis of DM2 made 5 to 10 years ago (38.8%). The most commonly used medication was Metformin (42.5%), followed by

the combination of Metformin with Glibenclamide (38.1%).

Approximately one third of the sample (31.3%) had annual follow-up care at the Basic Health Unit (UBS), which was also where most participants obtained their prescribed medications (42.5%). As for hospital admissions related to diabetes, the vast majority of participants had not been hospitalized (98.8%).

More than half of the participants (55%) reported having received education about diabetes at the UBS, with the most common guidance being that provided by health professionals at the unit (53.1%). It is noteworthy that 38.1% of the sample reported never having received any type of education about the pathology in question. Regarding non-pharmacological guidance, 70% indicated that they had not received information about treatments other than medication.

When asked about the main professional responsible for monitoring and managing the disease, 36.9% indicated their physician. Regarding the provision of guidance or care related to Integrative and Complementary Health Practices (IChP), 72.5% stated that they had never received any guidance on the subject. Regarding lifestyle, 67.5% of participants were sedentary, and the vast majority did not consume alcohol (86.3%) or tobacco (93.1%).

Regarding episodes of hypoglycemia and hyperglycemia in the last 30 days, 92.5% denied episodes of hypoglycemia and 75% denied hyperglycemia. Regarding the tests used in the management of the disease, 45% of participants performed fasting blood glucose tests every six months, while 41.9% reported never having measured their Glycated hemoglobin (HbA1c).

Table 1. Clinical characteristics of diabetes. Parnaíba, Piauí, Brazil, 2019. (n= 160)

Variables	n	%	SD
Family history of diabetes			
No	52	32.5%	0.470
Yes	108	67.5%	
Time of diagnosis with diabetes			
Less than 5 years	49	30.6%	0.953
5 to 10 years	62	38.8%	
11 to 20 years	33	20.6%	
Over 20 years	16	10.0%	
Treatment used for diabetes			
Metformin	68	42.5%	1.08
Glibenclamide	23	14.4%	
Metformin and glibenclamide	61	38.1%	
Glimiperid	3	1.9%	
Glimiperid and metformin	5	3.1%	
Frequency of follow-up at the health unit			
Monthly	44	27.5%	
Quarterly	37	23.1%	
Half-yearly	29	18.1%	
Yearly	50	31.3%	
Not tracked	-	-	
Place of purchase of medicines			
Basic Health Unit (Ubs)	68	42.5%	
Popular pharmacy (Farmácia popular)	49	30.6%	
Health department	1	0.6%	
Own resources	40	25.0%	
None of the above	2	1.3%	
Episode of hospitalization due to problems related to diabetes, in the last 30 days			
No	158	98.8%	
Yes	2	1.2%	
Received diabetes education			
No	72	45.0%	
Yes	88	55.0%	
Type of diabetes education			
None	61	38.1%	
Lectures	9	5.6%	
Guidance from healthcare professionals	85	53.1%	
Others	5	3.1%	
Received guidance on non-pharmacological treatment			
No	112	70.0%	
Yes	48	30.0%	

Original Article

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Professional responsible for maintaining treatment			
None	32	20.0%	
UBS doctor	59	36.9%	
UBS nurse	23	14.4%	
Other professional	46	28.7%	
Did the patient receive guidance from a doctor for diabetes control?			
No	116	72.5%	
Yes	44	27.5%	
Is the patient practicing physical exercise?			
No	108	67.5%	0.470
Yes	52	32.5%	
Does the patient use alcohol?			
No	138	86.2%	0.345
Yes	22	13.8%	
Does the patient use tobacco?			
No	149	93.1%	0.254
Yes	11	6.9%	
Episode of hypoglycemia in the last 30 days			
None	148	92.5%	
One	6	3.8%	
Two	4	2.5%	
More than two	2	1.2%	
Episode of hyperglycemia in the last 30 days			
None	120	75.0%	
One	12	7.5%	
Two	13	8.1%	
More than two	15	9.4%	
Frequency of glycosylated hemoglobin test			
Monthly	1	0.6%	
Quarterly	9	5.6%	
Half-yearly	28	17.5%	
Yearly	55	34.4%	
Never performed	67	41.9%	
Frequency of fasting blood glucose test			
Monthly	41	25.6%	
Quarterly	44	27.5%	
Half-yearly	72	45.0%	
Yearly	3	1.9%	

Clinical and anthropometric data were also collected, where the mean systolic blood pressure was 134 mmHg (SD = 21.6), and the diastolic blood pressure was 81.2 mmHg (SD = 11.6). The mean weight of the participants was 69.3 kg (SD = 12.8), the Body Mass Index was 29 kg/m² (SD = 4.57, max. 46.4, min. 18.6) and the Body Adiposity Index (BAI) was 35.80 (Table 2).

Table 2. Clinical, anthropometric and laboratory characteristics of people with type 2 Diabetes Mellitus. Parnaíba, Piauí, Brazil, 2019. (n= 160)

Variables	Men (n= 53)	Women (n= 107)	p-value*
	Mean (SD)	Mean (SD)	
HbA1c (%)	8,18 (± 2,0)	8,22 (± 2,0)	0,897
Fasting blood glucose (mg/dL)	170,6 (± 67,2)	172,9 (± 80,2)	0,856
BMI (kg/m ²)	28,0 (± 4,5)	29,4 (± 4,5)	0,050
Weight (kg)	74,3 (± 13,2)	64,5 (± 11,8)	<0,001
SBP (mmHg)	136,2 (± 19,7)	132,9 (± 22,4)	0,373
DBP (mmHg)	82,7 (± 11,5)	80,4 (± 11,6)	0,249
BAI	31,02 (± 4,71)	38,17 (± 5,32)	0,040

*Student's t-test for independent samples.

The comparison between clinical and anthropometric variables by sex revealed that the significant difference was observed in mean weight ($p=0.004$), where men had a mean weight of 76.6 kg ($SD=14.4$), while women had 66.6 kg ($SD=11.2$). The Body Adiposity Index (BAI) also showed a significant difference ($p=0.040$), with women presenting a mean BAI of 0.80 ($SD=0.07$) compared to men, with BAI of 0.73 ($SD=0.06$). Other variables such as fasting blood glucose, HbA1c and blood pressure did not show statistically significant differences between genders.

DISCUSSION

The findings of the present study show that the diagnosis of type 2 diabetes mellitus (DM2) occurred, in most cases, between 5 and 10 years after the onset of symptoms, corroborating similar studies. In a study conducted in a city in the Brazilian Midwest, a significant prevalence of diagnosis was observed within this interval, suggesting that late diagnosis may be a common characteristic among those with this condition.⁽⁸⁾

When DM is detected late, complications associated with the disease are more likely to develop, due to inadequate glycemic control over time. Among the main complications are diabetic neuropathy, which affects the nerves and can lead to amputations, diabetic retinopathy, which can cause blindness, and diabetic nephropathy, which can result in kidney failure. In addition, late diagnosis also increases the risk of cardiovascular diseases, such as atherosclerosis and heart attack, due to the negative impact of high glucose levels on blood vessels and kidneys.⁽⁹⁾

Regarding family history of diabetes, most participants reported cases of the disease in the family nucleus, highlighting heredity as an import-

ant risk factor for the development of DM2. A longitudinal study conducted with health workers in Thailand reinforces this observation, identifying a similar prevalence of family history of diabetes, which highlights the crucial role of genetics in the predisposition to diabetes.⁽¹⁰⁾

In addition to genetic predisposition, family history may also reflect the transmission of harmful behaviors and lifestyles, such as sedentary lifestyle and inadequate diets. These factors increase the risk of comorbidities such as hypertension and dyslipidemia, as shown in a study conducted in India.⁽¹¹⁾

Metformin, widely used by the participants in this study, has stood out as one of the most effective medications in glycemic control and in reducing complications associated with type 2 diabetes mellitus (T2DM). In addition to being well tolerated by patients, Metformin has a reduced side effect profile, being a low-cost option compared to other classes of medications.⁽¹²⁻¹³⁾

It was observed that women had more pronounced glycemic imbalances than men, a finding corroborated by a multicenter study conducted in European countries and Canada. This study sought to elucidate whether sex and gender factors influence access to health care and/or are associated with cardiovascular (CV) outcomes in individuals with DM. The authors demonstrated that, regardless of sex, in countries with greater gender inequality for women, there was worse treatment for diabetes and a higher risk of CV outcomes and hospitalizations.⁽¹⁴⁾

The prevalence of hyperglycemic episodes in the last 30 days was higher among participants who did not receive education on non-pharmacological glycemic management, suggesting a lack of information on the impact of these practices on glycemic control. Studies have shown that non-phar-

macological guidance has a positive effect on the treatment of T2DM, and encouraging these practices can help improve the stability of glycemic levels.⁽¹⁵⁾

In this context, a global systematic review study, with network meta-analysis, containing 107 randomized clinical trials, which focused on validating the effectiveness of non-pharmacological guidelines on glucose control for patients with type 2 DM, shows that they have a positive impact on treatment.⁽¹⁵⁾ Therefore, encouraging these control practices becomes an alternative that helps stabilize glycemic levels.

The lifestyle adopted by patients is another crucial factor in controlling DM2. The literature indicates that adopting healthy habits significantly reduces the risk of cardiovascular diseases and the incidence of diabetes. However, it was observed that most participants do not practice physical activity, which can increase the risk of microvascular complications and contribute to the development of obesity.⁽¹⁶⁾

Smoking and alcohol consumption reported by some participants demonstrate risk factors that are associated with a poor prognosis of the disease. Tobacco is associated with a decline in renal function in patients with DM2, and alcohol, due to its hepatotoxic effects, can lead to the emergence of comorbidities.⁽¹⁷⁻¹⁹⁾ Thus, the need for health education and psychosocial monitoring becomes even more essential to promote changes in the habits of this population.⁽²⁰⁾

The participants' HbA1c and BMI values were above the recommended limits, reflecting a worrying metabolic profile. Data corroborated by a retrospective study conducted at Yuxi People's Hospital in China showed that individuals with T2DM often have higher BMI, blood pressure and serum lipids, such as total cholesterol, triglycerides, low-density lipoprotein (LDL) and high-density lipoprotein (HDL), compared to those without

the disease.⁽²¹⁾

The study highlighted that high levels of TC, TG and LDL-C are related to worse glycemic control, while higher concentrations of HDL-C demonstrated an inverse association with HbA1c levels. These findings reinforce the need for an integrated approach that includes regular monitoring of lipid profiles, since dyslipidemias can intensify glycemic imbalance and contribute to the progression and complications of DM2.⁽²¹⁾ Furthermore, monitoring these variables is essential to direct more effective therapeutic strategies in the management of the disease.

Excess body weight is a relevant factor for the development of DM2, particularly among women, with a significant increase in cases in the postmenopausal phase. The reduction in estrogen levels during this period contributes to the accumulation of abdominal fat, which is closely linked to insulin resistance and an increased risk of cardiovascular diseases, such as atherosclerosis. Furthermore, although menopausal hormone therapy has shown potential in reducing the risk of DM2 and improving glycemic control in women with preexisting diabetes, the evidence is not yet sufficient to recommend its use as a strategy for preventing or controlling diabetes in postmenopausal women.⁽²²⁾

Regarding clinical and anthropometric data, the results indicate that the participants were overweight, a factor that is associated with an increased risk of metabolic and cardiovascular complications in individuals with DM2. Studies suggest that body mass index (BMI) variability is an important marker for adverse cardiovascular events in this population.⁽²³⁾ Regarding blood pressure, the mean values were compatible with the goals established by the Guidelines of the Brazilian Diabetes Society, which recommend levels below 140x80 mmHg for patients with diabetes, aiming at

reducing macrovascular and microvascular complications related to hypertension.⁽²⁴⁾

This study has limitations, such as the sample size, which may not be representative of the entire population with DM2, and the possibility of bias due to the reliance on self-reports for the collection of some variables. In addition, the cross-sectional nature of the study prevents the determination of causal relationships between the variables. However, the information generated provides important support for the planning of interventions targeted at patients with DM2.

IMPLICATIONS FOR HEALTH AND NURSING PRACTICE

The impact of menopause on glycemic control, gender differences, and the high prevalence of high BMI among people with type 2 diabetes have been shown to reinforce the need for individualized approaches to care that are sensitive to the particularities of the clinical profile of different subgroups of patients. In addition, the implementation of health education strategies, focusing on lifestyle changes and metabolic control, can improve clinical outcomes and reduce long-term complications of T2DM.

Furthermore, the data indicate the importance of developing policies that integrate a multidisciplinary approach to the care of people with T2DM, strengthening interdisciplinary actions for effective glycemic control and reduction of associated risk factors. Furthermore, gaps were revealed regarding gender differences in the management of diabetes, especially in postmenopausal women, suggesting the need for further studies that explore specific and effective interventions for this population.

CONCLUSION

This study demonstrated significant gender differences in the man-

agement and clinical outcomes of T2DM. Women presented more pronounced glycemic imbalances than men, with inequality in access to treatment worsening the clinical outcome. The postmenopausal phase stood out as a critical period for the development of T2DM, due to the reduction in estrogen levels, which favors the accumulation of abdominal fat, increasing the risk of insulin resistance and cardiovascular diseases.

The clinical data analyzed corroborate the association between high BMI, an unfavorable lifestyle and the negative impact on glycemic control. This reinforces the need for continuous monitoring of these factors in patients with T2DM. In addition, the lack of effective education on glycemic management and low adherence to non-pharmacological guidelines were identified as significant barriers to disease control, highlighting the importance of a multidisciplinary approach, including health education.

The study also contributes to the understanding of T2DM, highlighting the importance of a detailed clinical profile, which considers biological, social and behavioral factors. These factors, together, determine the prognosis and quality of life of patients. Therefore, treatment strategies must be individualized, considering the particularities of each patient. Interventions must combine pharmacological treatment, promotion of healthy habits and continuous education, with the aim of improving the prognosis of individuals.

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