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Original article

Clinical characteristics and experience of physical-emotional symptoms among older adults with type 2 diabetes mellitus*

Características clínicas e experiência dos sintomas físico-emocionais de pessoas idosas com *diabetes mellitus* tipo 2

Características clínicas y experiencia de los síntomas físicos y emocionales en personas mayores con diabetes mellitus tipo 2

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Abstract

Objective: To describe the sociodemographic and clinical characteristics and the symptom experience of older adults with type 2 *diabetes mellitus* stratified as high-risk. **Method:** A mixed-methods study conducted between September 2024 and May 2025. Quantitative data were collected via forms and clinical scales and analyzed using descriptive statistics; qualitative data were gathered through semi-structured interviews—recorded, transcribed, and analyzed using ATLAS.ti (v. 25) software for analysis, categorization, and in-depth exploration. **Results:** Eighteen older adults participated (two did not undergo the qualitative interview); the mean age was 72.1 years, 55.3% were married, 55.6% were retired, and the mean glycated hemoglobin level was 9.4%. Tingling in the feet (66.6%) and altered sensitivity—detected via 10g monofilament (55.5%) and 128 Hz tuning fork (33.3%) tests—were observed. The "Symptom Experience" category highlighted physical symptoms, fatigue, discomfort, anxiety, and worsening vision. **Conclusion:** The symptom experience is physical and emotional, characterized by dualities that influence the current stage of life and the quality of survival.
Descriptors: Aged; Diabetes Mellitus; Signs and Symptoms; Primary Health Care; Nursing

Resumo

Objetivo: descrever características sociodemográficas, clínicas e a experiência dos sintomas de idosos com *diabetes mellitus* tipo 2 estratificadas como de alto risco. **Método:** pesquisa quantiqualitativa realizada entre setembro/2024 e maio/2025. Coletaram-se dados quantitativos por formulários e escalas clínicas, analisados por estatística descritiva; e qualitativos, por

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entrevistas semiestruturadas gravadas, transcritas e analisadas no *software* ATLAS.ti (v. 25), para análise, categorização e aprofundamento. **Resultados:** participaram 18 idosos (dois sem entrevista qualitativa), com média de 72,1 anos, 55,3% casados, 55,6% aposentados e com hemoglobina glicada média de 9,4%. Observaram-se formigamento nos pés (66,6%) e alteração na sensibilidade pelos testes de Monofilamento 10g (55,5%) e Diapasão 128 Hz (33,3%). A categoria "Experiência dos Sintomas" apontou sintomas físicos, fadiga, desconforto, ansiedade e piora da visão. **Conclusão:** a experiência dos sintomas é físico-emocional, permeada por dualidades que influenciam o momento atual de vida e a qualidade da sobrevida.
Descritores: Idoso; Diabetes Mellitus; Sinais e Sintomas; Atenção Primária a Saúde; Enfermagem

Resumen

Objetivo: Describir las características sociodemográficas y clínicas y la experiencia sintomática de personas mayores con *diabetes mellitus* tipo 2 estratificadas como de alto riesgo. **Método:** Se realizó un estudio cuantitativo-cualitativo entre septiembre de 2024 y mayo de 2025. Los datos cuantitativos se recopilaron mediante formularios y escalas clínicas, y se analizaron mediante estadística descriptiva; y los datos cualitativos se recopilaron mediante entrevistas semiestructuradas que se grabaron, transcribieron y analizaron utilizando el software ATLAS.ti (v. 25) para su análisis, categorización e investigación posterior. **Resultados:** Participaron dieciocho personas mayores (dos sin entrevista cualitativa), con una edad media de 72,1 años, 55,3% casadas, 55,6% jubiladas y con una hemoglobina glicosilada media de 9,4%. Se observó hormigueo en los pies (66,6%) y alteración de la sensibilidad utilizando la prueba del monofilamento de 10 g (55,5%) y la prueba del diapasón de 128 Hz (33,3%). La categoría "Experiencia de los síntomas" destacó los síntomas físicos, la fatiga, el malestar, la ansiedad y el empeoramiento de la visión. **Conclusión:** la experiencia de los síntomas es físico-emocional, impregnada de dualidades que influyen en el momento presente de la vida y en la calidad de vida.
Descriptores: Anciano; Diabetes Mellitus; Signos y Síntomas; Atención Primaria de Salud; Enfermería

Introduction

Type 2 diabetes mellitus (T2DM) is a chronic non-communicable disease (NCD) often linked to conditions like a sedentary lifestyle and aging, with a high potential for cardiovascular risk and hospitalizations. T2DM ranks fourth among the causes of death in people over 50; in 2023, there were 17,909 deaths from diabetes in people aged 60-69, 23,476 among those 70-79, and 29,355 in people over 80.[1] Besides mortality, the development of complications is notable, affecting quality of life, causing mobility issues, and making it harder to carry out basic daily activities (BDAs).[2]

Diagnosis of the disease relies on laboratory tests to detect hyperglycemia, specifically fasting plasma glucose, random plasma glucose, the oral glucose tolerance test (OGTT), and glycated hemoglobin (HbA1c) levels.[3] Establishing a clinical diagnosis requires two abnormal results from the same test or abnormal results from two different tests.[4]

According to risk stratification, individuals with HbA1c levels below 7% are considered low risk; those between 7.1% and 8.0% are intermediate risk; those between 8.1% and 8.9% are complex intermediate risk; and those above 9% are high risk. For the older population, the target is adjusted to 8% in cases of frailty risk or established frailty, due to the increased risk of hypoglycemia.[5]

Older individuals with T2DM stratified as high risk are particularly affected by metabolic imbalance, which increases the risk of developing complications such as neuropathy and diabetic foot. Although often asymptomatic, these complications can trigger a range of symptoms that impact the older adult's life, leading to changes in daily routines, suffering, isolation, and other consequences that compromise quality of life.[6]

Given this scenario, it is crucial to understand and assess the full spectrum of symptoms presented by this population, as untreated physical manifestations can contribute to the development of anxiety, isolation, and depression. Investigating the relationship between physical and emotional symptoms is essential for improving clinical care and guiding interdisciplinary interventions that preserve mental health and mitigate the decline in quality of life among this population.[6]

In this context, properly understanding and identifying symptoms in older adults with T2DM is crucial; as the disease progresses, these symptoms become more pronounced and frequent, requiring a comprehensive approach that goes beyond the biological aspect and enables the professional to develop a care plan centered on the older adult.

Given the importance of this topic, the study aimed to describe the sociodemographic and clinical characteristics, as well as the symptom experience, of older adults with T2DM stratified as high-risk.

Method

This was a quantitative and qualitative study conducted from September 2024 to May 2025 at a Health Unit in the city of Curitiba, Paraná, Brazil. The study population consisted of older adults enrolled in the diabetes program and stratified as being at high risk. The decision to conduct the study in a single health unit was justified by its central location, its provision of care across chronic and acute care pathways, and the fact that it had the largest number of registered older adults. There were 45,100 older adults with permanent registration, of whom 1,296 were enrolled in the diabetes program.

Participants were recruited by posting invitation posters in strategic locations throughout the health unit, such as the reception area and pharmacy. The inclusion criteria were: age ≥60 years; enrollment in the diabetes program and classification as high risk; and preserved cognitive status, as assessed using the Mini-Mental State Examination. The exclusion criteria were incomplete completion of the data collection instruments and failure to attend the scheduled appointment after at least three attempts to contact the participant.

A descriptive quantitative cross-sectional approach was adopted, with data collected using forms containing sociodemographic, clinical, and anthropometric variables, as well as assessment scales. The sociodemographic variables included sex, age, race, marital status, educational level, income, living arrangements, and physical condition. The clinical variables included HbA1c level, diabetic foot assessment, smoking history, and diabetes-related clinical conditions (measures of type 2 diabetes mellitus [T2DM] control, history of wounds, tingling/pain in the feet, and loss of sensation). HbA1c levels were obtained from previous laboratory tests recorded in the medical records, considering the most recent value recorded within one year prior to the date of data collection. Diabetic foot assessment was performed in all participants using the 128-Hz tuning fork test (DIAP)[5], the 10-g monofilament test (Semmes-Weinstein)[5], and the Light Touch Test (Ipswich Touch Test).[5]

Anthropometric assessment included: Body Mass Index (BMI), blood pressure, and waist, hip, and calf circumferences. The following scales were administered: Functional Clinical Vulnerability Index (FCVI-20); Diabetes Knowledge

Questionnaire (DKN-A); Diabetes Attitude Questionnaire (ATT-19); DIABETES-21 (D21)[8]; and Diabetes Self-Care Attitudes (QAD).[9] All questionnaires were administered by the research team, comprising the principal investigator, a PhD nursing student, and eight undergraduate nursing students.

The following parameters were adopted for anthropometric variables: underweight (BMI < 22), normal weight (BMI 22–27), overweight (BMI > 27), obesity (BMI > 30 for men; BMI > 32 for women); blood pressure[10] (pre-hypertension: systolic 120–139 mmHg; diastolic 80–89 mmHg); waist circumference: high risk (waist ≥ 80 cm for women; waist ≥ 94 cm for men), very high risk (waist ≥ 88 cm for women; waist ≥ 102 cm for men); calf circumference < 34 cm for women and < 33 cm for men indicates a risk of reduced muscle mass, while < 31 cm indicates sarcopenia.[10]

Assessments took place predominantly in a consultation room at the Health Unit or at the homes of older adults with significant mobility limitations.

All data were collected using paper-based instruments and subsequently entered into Excel® spreadsheets with double-checking for descriptive analysis. Simple descriptive statistical techniques were used for analysis, calculating means, standard deviations, maximums, and minimums, with results presented in tables. For the analysis of the QAD scale, the mode proved to be a more suitable measure than the mean, given that the analysis involved frequencies.

The exploratory qualitative approach was based on interviews conducted using a semi-structured interview guide, comprising the following questions: Since you were diagnosed with high-risk diabetes mellitus (DM), have you noticed any symptoms that you did not experience before? How do you perceive and respond to this symptom? Has this symptom caused any changes in your life or daily routine?

The interviews were audio-recorded, transcribed using the transcription tool in *Microsoft Word*, and subsequently imported into *ATLAS.ti* software (version 25) for data analysis, categorization, and in-depth examination. For the initial coding process, the software's "AI-driven intentional coding" tool was used. In constructing concepts from the raw data, each segment of the participants' statements was read, compared with other segments, and assigned a label (code) that captured its essence.

All assessments, including diabetic foot examinations, administration of questionnaires and scales, and the recorded interviews, were conducted by the research team, which had been trained to perform the procedures during in-person and online training sessions held prior to the beginning of data collection. Undergraduate students were accompanied by the principal researcher during at least two data-collection sessions, ensuring that the procedures were properly understood and correctly performed.

In the presentation of the results, interview excerpts were identified by the initials OP (older person), followed by an Arabic numeral from 1 to 18, sequentially according to the order in which participants were included in the study. The ethical principles established by Resolutions 466/2012 and 510/2016 of the Brazilian National Health Council and Resolution 580/2018 of the Ministry of Health were observed. The study was approved by the Research Ethics Committee of the Federal University of Paraná under CAAE number 67793523.1.0000.0102 on May 23, 2023, and by the Curitiba Municipal Health Department under CAAE number 67793523.1.3001.0101 on July 21, 2023.

Results

Eighteen older adults diagnosed with T2DM participated in the study; the mean age was 72.1 years, with the 60–69 age group being the most represented (44.4%). The majority were white (77.8%), legally married (55.3%), and lived with their spouse (55.6%) and children (44.4%); they had at least eight years of schooling and an income of one to three minimum wages (50%), derived primarily from retirement benefits (55.6%) (Table 1).

Table 1 - Distribution of older adults according to sociodemographic characteristics, Curitiba, Paraná, 2025, n=18

Variable	Older adults		
	N	%	
Age			
60-69	8	44.4	
70-79	6	33.3	Mean 72.1
80-89	4	22.3	SD±7.8
Race			
White	14	77.8	
Brown	2	11.2	
Black	1	5.5	
Yellow	1	5.5	
Marital status			
Legally married	10	55.3	
Single	2	11.2	
Widowed	4	22.3	
Divorced	2	11.2	
Income (minimum wage)			
1 to 3	9	50	
4 or more	6	33.3	
Without income	2	11.2	
Ignored	1	5.5	
Income (Origin)			
Retirement	10	55.6	
Pension	3	16.7	
Wage employment	1	5.5	
Other income (rent/investments)	3	16.7	
None	2	11.2	
Education			
No formal education	1	5.5	
Elementary/Middle school	4	22.3	
High school	5	27.7	
Higher education	6	33.3	
Graduate studies	2	11.2	
With whom the older person resides*			
Spouse/Partner	10	55.6	
Children	8	44.4	
Alone	3	16.7	
Sibling/Brother/Sister-in-law	1	5.5	
Physical condition			
Able of walking	16	89	
Use of assistive device	1	5.5	
Use of wheelchair	1	5.5	

*Values presented per line, as the sum exceeds 100% due to the allowance of multiple responses.

In the MMSE assessment, the mean score was 26.7 (min. 22; max. 30), indicating preserved cognitive status. In the FCVI-20 assessment, the mean score was 12.6 (min. 0; max. 29); six older participants scored above 15, indicating a high risk for functional decline.

Regarding the knowledge assessment (DKN-A), scores ranged from 7 to 13 points (Mean 9.9; SD ±1.7), reflecting a satisfactory level of understanding regarding the disease. As for the assessment of attitudes toward the disease (ATT-19), scores ranged from 40 to 71 (Mean 50.3; SD ±7.5), demonstrating low emotional adaptation, given that good adaptation is represented by scores above 70 points. Finally, in the quality of life assessment (Diabetes-21), scores ranged from 26 to 86 (Mean 47.3; SD ±16.1), indicating a moderate impact of the disease on the participants' daily routines.

In the QAD assessment, the most frequent value was 7 (Mode = 7), revealing that 83.3% of participants reported daily practice of the following behaviors: healthy eating, blood glucose monitoring, foot inspection, shoe inspection, drying between the toes, and taking medications as prescribed. Conversely, for the items "how many days did you eat sweets," "how many days did you engage in physical activity," and "how many days did you perform specific activities (swimming, walking, running)," the mode varied (mode = 0 and 1/day), indicating a lower frequency of these behaviors. The mean HbA1c value was 9.4% (minimum 7.2; maximum 14.7). Table 2 presents the assessment of BMI, blood pressure, and abdominal, hip, and calf circumferences.

Table 2 - Characterization of the older adults according to clinical assessment, Curitiba, Paraná, 2025, n=18

Variable	Older adults		
	N	%	
BMI* (n=16)			
Underweight (<18.5)	0	-	
Normal weight (18.5 - 24.9)	6	37.5	Mean 26
Overweight (25 - 29.9)	5	31.2	SD ±5.1
Obesity (>30)	5	31.2	
Waist Circumference (n=16)			
*Men**			
No Risk	1	6.2	
High Risk	3	18.7	
Very High Risk	3	18.7	Mean 100.4
Women			SD±9.8
No Risk	0	-	
High Risk	1	11.1	
Very High Risk	8	88.9	
Calf Circumference			
Men			
< 33	3	18.7	
≥ 34	6	33.3	Mean 36.2
women			SD±4.1
< 34	4	22.3	
≥ 35	5	27.7	
Systolic Blood Pressure (mmHg)			
100 to 120	4	22.3	
121 to 130	6	33.3	Mean 131.4
131 to 140	5	27.7	SD±14.5
141 to 150	2	11.2	
>150	1	5.5	
Diastolic Blood Pressure (mmHg)			
60 to 70	7	38.8	
71 to 80	9	50	Mean 75.8
81 to 90	2	11.2	SD±7.2
>90	0		

*Total of 16 due to the physical condition of two users, which did not allow for the measurement check (one wheelchair user and one bedridden).

Table 3 presents diabetes control measures—highlighting those for type 2 diabetes—as well as the history of diabetes-related diseases and conditions, such as a sensation of tingling in the legs and feet and a history of injuries.

Table 3 - Distribution of older adults according to clinical assessment of conditions related to type 2 diabetes, Curitiba, Paraná, 2025, n=18

Variables	Older adults	
	N	%
Diabetes management measures*		
Diet/physical activity	8	44.4
Insulin	13	72.2
Oral medication	13	72.2
History of leg/foot wound or lower-limb amputation/surgery of the lower limbs		
Yes	5	27.7
No	13	72.3
History of angioplasty, stent, or revascularization		
Yes	3	16.7
No	15	83.3
History of foot wound taking longer than 3 weeks to heal		
Yes	4	22.3
No	14	77.7
History of smoking		
Yes	3	16.7
No	15	83.3
Sensation of tingling or burning in the feet		
Yes	12	66.7
No	6	33.3
Sensation of tingling or burning in the legs		
Yes	7	38.9
No	11	61.1
Pain in the legs or feet at rest		
Yes	8	44.4
No	10	55.6
Pain in the legs or feet during physical activity		
Yes	6	33.3
No	12	66.7
Skin lesions or discoloration		
Yes	4	22.3
No	14	77.7
Loss of sensation in the lower extremities		
Yes	9	50
No	9	50
Regular foot assessments by a healthcare professional		
Yes	5	27.7
No	13	72.3

*Values presented per line, as the sum exceeds 100%.

Clinical assessments of the diabetic foot were performed on all older individuals, comprising dermatological, musculoskeletal, vascular, and neurological examinations, including tests for sensation, vibration, and light touch (Table 4).

Table 4 - Distribution of older individuals according to clinical assessment of the diabetic foot, Curitiba, Paraná, 2025, n=18

Variables	**Older adults**	
	N	%
Dermatological examination*		
Discolored or hypertrophic lesions, calluses, or spurs	2	11.1
Discolored, ingrown, or long nails	6	33.3
Wounds or fissures (cracks)	3	16.7
Interdigital maceration (whitish, soft skin)	2	11.1
Signs of fungal infection	7	38.9
No dermatological abnormalities	9	50
Musculoskeletal examination*		
Full joint mobility	16	88.9
Visible deformities	3	16.7
Warm, red, or inflamed midfoot	1	5.5
Vascular examination*		
Palpable dorsalis pedis and posterior tibial pulses	14	77.8
Reduced hair growth on the dorsum of the foot or lower limbs	2	11.1
Temperature difference between calves and feet	2	11.1
Other information*		
Poor foot hygiene	2	11.1
Deformities or bony prominences	3	16.7
No abnormalities	13	72.2
Neurological examination		
Monofilament test		
Preserved Sensation	8	44.5
Impaired Sensation	10	55.5
Tuning fork test		
Preserved Sensation	12	66.7
Impaired Sensation	6	33.3
Light touch test		
Preserved Sensation	14	77.8
Impaired Sensation	4	22.2

The values are presented per line because their sum exceeds 100%.

Experience of Symptoms of Type 2 Diabetes Mellitus Stratified as High Risk

Among the study participants, 16 older adults took part in the qualitative approach, considering the acute exacerbation of a clinical condition observed in two participants during the data collection period, which made it impossible to conduct the interviews. The data were coded to structure the central phenomenon. The "Experience of Symptoms" encompasses a combination of physical symptoms related to alterations resulting from T2DM, as well as its complications. These conditions reflect feelings and bodily symptoms that are relevant to nursing care planning and clinical decision-making.

It is noteworthy that older adults with T2DM stratified as high risk, when experiencing symptoms, reflected on their glycemic condition. They also reported discomfort and distress, which were generally constant and associated with symptoms such as pain, tingling, malaise, and nausea. In their accounts, these symptoms were associated with treatment or aspects of the disease itself and were aggravated by the high-risk condition.

> *I feel generally unwell—some discomfort—but it's quite mild; it's part of having diabetes. (OP_10)*
> *Headaches, tingling, feeling unwell, the urge to vomit—I experience all of that. (OP_11)*
> *I feel pain that isn't unbearable—not a 6 or 8 on the pain scale—but it's the kind of pain that bothers me all day long. (OP_12)*
> *It's just what I told you: I get nauseous, you know? But that's normal for the disease and its complications. (OP_15)*
> *I can't seem to feel right because of my stomach lining; it gets very irritated. I try to take the medication within the limits of what I can tolerate. For example, at night—every night—there's a whole cocktail of medications. (OP_18)*
> *My foot is hurting now; when things got worse, the pain increased. (OP_5)*
> *I had foot pain. Not much, but it was there. (OP_9)*
> *I feel tingling in my legs and feet; sometimes it's really bothersome, but other times it lasts just a moment and then goes away. (OP_10)*
> *I experience nausea; I get a sick-to-my-stomach feeling. (OP_11)*
> *I have tingling in my feet every day. (OP_12)*
> *When my diabetes is really uncontrolled, my vision problems get worse. There are days when I wake up and—if my diabetes is stable—I can see just fine. But when I have trouble seeing, it means my diabetes is very uncontrolled, and the difficulty is significant. (OP_18)*

The health condition of an older person with type 2 diabetes classified as high risk shows feelings of tiredness and visual changes, which may be linked to changes caused by the disease itself or even by poor management of their condition. These symptom experiences relate to doubts in understanding the disease/signs/symptoms, the treatment, and complications, highlighting the need for new daily adjustments, especially due to the worsening of high-risk type 2 diabetes, with clinical changes: worsening vision, fainting from hypoglycemia, and weakness.

> *It's overwhelming; I feel extremely tired. Sometimes I feel as if I'd gone out partying and never come back. It's extreme exhaustion. (OP_18)*
> *I've been feeling more tired these last few months. I don't know if it's the disease or something else, but there's a lot of fatigue and dry mouth; I can't do the same things I used to. (OP_02)*
> *I feel a bit of fatigue; I think it might be due to a lack or excess of insulin. It's not something that happens every week, though—I just feel that tiredness at certain times. (OP_13)*
> *I have leg pain, especially since the stroke. I don't know how the diabetes played a part, but I feel very tired and have pain in my legs and arms. (OP_12)*
> *I don't understand this feeling of fatigue—this tiredness that diabetes causes. (OP_14)*
> *I didn't use to have issues with fainting or my blood sugar dropping too low; that all stems from my diabetes getting worse. My vision deteriorated, too—it just kept getting worse. That's how it was: worse every day, and I was able to do less. (OP_3)*
> *Well, it started when I began having tests done. I felt like my vision was weak when trying to see small details. But now it's much more complicated; I have to figure out ways to manage going out alone and reading things. (OP_12)*
> *I've experienced vision loss. Unfortunately, it has been getting worse. Things look darker, and I have trouble reading; it happens all the time. (OP_18)*

Older adults with high-risk type 2 diabetes experience conflicting emotions—characterized by uncertainty and worry regarding their health status and the disease itself, as well as future prospects—stemming primarily from T2DM-related complications. Reports reveal feelings of insecurity regarding medical tests and clinical assessments, alongside distress—particularly concerning the motivation to stay alive. Anxiety is exacerbated by the high-risk T2DM diagnosis; associated symptoms trigger agitation, which undermines self-care efforts and worsens the individual's health condition.

> *I believe my blood sugar needs to be checked. I don't know if the condition is serious—I'll only know after the test—but I am worried. (OP_17)*
> *I feel worried and anxious about whether I might lose my leg or my foot. I don't want that. (OP_01)*
> *You feel a bit apprehensive, disheartened, and unmotivated to live. Because I know something is wrong, and I don't want that. (OP_02)*
> *Before, I didn't have any issues; I was fine, and then it all hit at once. Everything kept getting worse; I have no desire to get better, so you end up neglecting yourself, and things just keep getting worse. (OP_9)*
> *Diabetes makes us anxious. You have a strong urge to go to the bathroom—you have to go every half hour—and that makes you restless; life becomes more hectic and worse. (OP_13)*

It is evident that feelings, fears, and anxieties influence motivation regarding survival. Throughout the process, individuals question the link between changes in their condition and the disease itself, its treatment, and complications—often interpreting these based on their existing knowledge and information. Individuals also consider symptoms and glycemic parameters—such as vision changes and polyuria—establishing personal benchmarks to identify hypoglycemia or hyperglycemia.

Thus, codes related to physical symptoms, uncertainty, fatigue, and agitation reveal different facets of subjective perception, shaping the individual's own assessment of their condition. Other codes—such as pain, worry, and anxiety—are linked to a sense of uncertainty regarding the present and future, particularly concerning complications arising from Type 2 Diabetes.

The data demonstrate that the symptom experience of older adults with high-risk T2DM is not determined solely by physical factors; rather, it is a process integrated with feelings—making it a physical-emotional experience that influences daily practices, health-related decisions, and the motivation to survive.

Discussion

Among the older Brazilian population, the most common age group is 60-69[1] years. In those diagnosed with type 2 diabetes, white, married individuals with children stand out, with education of 8 years or more, and income of one to three minimum wages.[11] It's relevant to assess cognitive status in this group, evaluated by the MMSE, which is important for screening changes, quick to apply, and internationally recognized.[12] And also the risk for clinical-functional frailty, using the FCVI-20, a tool that

is easy to use and interpret, can be applied by any healthcare professional, and is important for early identification of functional risk, allowing for effective interventions.[13]

Regarding knowledge, the DKN-A Scale assesses basic knowledge of diet, capillary blood glucose, and the management of hypoglycemic symptoms.[14] In the assessment of attitudes (ATT-19), participants in the present study had a mean score of 50.3 points (40–71), indicating a predominance of negative attitudes. This score was lower than the mean reported in another study involving 214 older adults, in which 67 participants (32%) exhibited positive attitudes.[15] Assessing knowledge and attitudes toward coping with the disease provides relevant indicators of the impact of health education interventions delivered by healthcare professionals, demonstrating the extent to which older adults assimilate the information received and how they respond to the changes brought about by the disease.[7]

Furthermore, an integrative review of literature identified that the quality of life of people with DM has a gradual reduction in development, which may be aggravated by factors such as diabetic polyneuropathy, presence of lesions and pain.[16]

In self-care, a qualitative study with 12 experts evidenced that concern with healthy nutrition and physical activity was quite cited among the older adults, but in some moments the restriction could represent a factor of suffering among the population.[17] Healthy eating habits and care for feet it is among the most prevalent self-care attitudes among older adults, however the practice of checking capillary blood glucose was below expectations, justified by the difficulty in obtaining a device for verification at home.[18] A self-care action is blood sugar monitoring, linked to the *Sob Controle* Program, where people receive a glucose meter and supplies through the Unified Health System (SUS), having monthly parameter monitoring at the Basic Health Unit (BHU), making it easier to identify failures and the need for treatment adjustments.[6]

Regarding the assessment of HbA1c levels, values above 7% are associated with an increased risk of microvascular complications, such as retinopathy, microalbuminuria, and neuropathy. In older adults, the target may be somewhat more flexible, depending on functional and cognitive status, due to the higher risk of hypoglycemia associated with more stringent targets. Therefore, regular monitoring of HbA1c is even more important in this population.[19]

Alongside this marker, anthropometric measurements should also be considered, as the accumulation of abdominal adipose tissue is associated with increased insulin resistance, secretion of inflammatory cytokines, and other metabolic dysfunctions that contribute to increased cardiometabolic risk. It is also associated with factors such as smoking, alcohol consumption, sleep quality, daytime sleepiness, and multimorbidity.[20]

For older adults, another important parameter is calf circumference, which assists in identifying the risk of sarcopenia,[21] as well as blood pressure, with prehypertension defined as systolic values between 120 and 139 mmHg and diastolic values between 80 and 89 mmHg.[10]

Furthermore, adherence to treatment is a crucial factor in the management of type 2 diabetes mellitus (T2DM). Treatment involves both pharmacological and non-pharmacological approaches, including healthy eating, regular physical activity, weight control, and monitoring of blood glucose levels.[22] Although widely disseminated, diabetes management measures remain a constant challenge for primary health care professionals. According to the *American Diabetes Association* (ADA), only 50% of patients are able to achieve desirable glycemic targets, indicating that there are shortcomings related both to intrinsic factors of the older adult and to extrinsic factors associated with the health education process and multidisciplinary care.[23]

Regarding the symptoms perceived by older adults with T2DM, tingling, pain, and loss of sensation are noteworthy, as they are associated with diabetic neuropathy. This condition is multifactorial and debilitating, affects up to 50% of people with diabetes, involves peripheral nerves, increases the risk of injuries, and negatively affects quality of life.[24]

A study reported a high prevalence of amputation and poor quality of life, underscoring the importance of implementing preventive measures to control the disease and prevent complications, as well as identifying symptoms and conducting a multidimensional assessment of the lives of individuals with type 2 diabetes mellitus (T2DM).[25] In this context, diabetic foot examination is essential. Calluses, blisters, and fissures are considered pre-ulcerative lesions and should be carefully assessed. Among

the recommended measures, appropriate footwear selection is particularly important, with shoes of a size compatible with the metatarsophalangeal joints and sufficient height to accommodate all toes comfortably.[5]

Foot care should be reinforced by healthcare professionals, taking into account difficulties such as reduced visual acuity, mobility problems, obesity, motor skills required for nail trimming, and difficulties with personal hygiene, which may result in ineffective self-assessment.[26] Moreover, visual impairment may result from persistent hyperglycemia associated with inadequate metabolic control and may progressively lead to diabetic retinopathy, a microvascular complication that causes structural and functional changes in retinal blood vessels and may result in irreversible blindness. Assessing the presence of these visual symptoms is important for the early identification of this manifestation and for determining strategies to delay the progression of this complication.[4]

One of the main risk factors for the development and progression of retinopathy is elevated HbA1c levels; therefore, adequate metabolic monitoring and control are essential to reduce the prevalence and progression of retinopathy.[27] Approximately 34% of patients with diabetes will develop ulcers during their lifetime, and ulcer development is associated with a 5% mortality rate at 1 year, increasing to 42% at 5 years, with consequent functional impairment and negative impacts on quality of life.[23]

Symptoms such as pain and tingling may be associated with peripheral neuropathy, defined as a diffuse, symmetrical, distal, and progressive lesion of sensory-motor and autonomic fibers resulting from persistent hyperglycemia.[4] This condition is particularly concerning among older adults, as it may contribute to mobility problems, increasing the risk of falls, and is also associated with premature mortality.[28]

The development of lesions, as well as the occurrence of other symptoms, contributes to reduced functionality and treatment adherence among older adults, affecting mood, social interactions, and the performance of basic activities of daily living. Therefore, the assessment of older adults with type 2 diabetes mellitus (T2DM) stratified as high risk poses a challenge for healthcare professionals and should be regularly updated, incorporating new approaches specifically tailored to this population.

Furthermore, it is important to assess fatigue and discomfort, as these symptoms may reveal how the condition manifests when it is not adequately controlled, as observed among individuals with high-risk T2DM and HbA1c levels above 9%.[29] In addition, physical symptoms can trigger emotional responses, as evidenced by feelings of uncertainty, worry, and anxiety, particularly regarding current and future health conditions. A psychological dimension thus emerges from the experience of symptoms, underscoring the importance of an assessment focused on the individual and aimed at promoting comprehensive care.[30]

This study revealed that the axial category "Symptom Experience" reinforces the concept of subjectivity, encompassing aspects that affect daily life and survival. Physical symptoms, such as sleep disturbances, fatigue, and impaired vision, are directly associated with feelings of uncertainty, worry, and anxiety, indicating that the experience of symptoms among individuals with T2DM stratified as high risk is therefore both physical and emotional.

Among the limitations of the study, it stands out that the research only includes a public health service, and it is not possible to compare the experiences. It is recommended that future research be conducted addressing different sociocultural contexts, to expand knowledge on the topic.

The identification of the sociodemographic and clinical profile of older adults with type 2 diabetes mellitus (T2DM), particularly those stratified as being at high risk, provides a basis for the development of structured and precise nursing interventions. By incorporating the experience of symptoms into the care plan, nurses move beyond the biomedical model and adopt a person-centered approach that recognizes the impact of symptoms on the quality of life of this population. Such alignment between individuals' perceptions and clinical management is essential to reduce treatment gaps and enhance the biopsychosocial well-being of older adults.

The findings of this study broaden the understanding of older adults with T2DM stratified as being at high risk by considering their sociodemographic and clinical characteristics, as well as their experience of symptoms throughout the process of living with the disease. Overweight, obesity, and very high cardiovascular risk were observed among the participants, along with tingling and loss of sensation in the lower limbs.

These findings underscore the need for individualized care and a comprehensive approach to symptom assessment.

Thus, the findings of this study support the understanding that the experience of symptoms among older adults with high-risk T2DM is physical and emotional, involving a process that influences both their current and future life experiences. These findings highlight the importance of developing public health policies with initiatives specifically targeted at this population, planned and implemented through strategies that actively involve older adults in decision-making, promote shared information, reduce fear and anxiety, and foster autonomy in the management of their treatment.

Conclusion

The quantitative analysis showed that older adults with high-risk type 2 diabetes mostly consisted of individuals aged between 60 and 69, white, married, retired, and with a high school education or higher. Although they had preserved cognitive function and satisfactory knowledge about the disease, low emotional adaptation to diabetes and a moderate impact on quality of life were observed. Regarding self-care, there was good adherence to practices related to diet, blood sugar monitoring, foot care, and medication use, while regular physical activity and reduced sweets consumption were less common. Additionally, poor glycemic control stood out, with a mean glycated hemoglobin of 9.4%, a high prevalence of overweight and obesity, and a very high cardiovascular risk, especially among women.

Regarding diabetes-related complications, a high prevalence of neuropathic symptoms was observed, including tingling or burning sensations in the feet (66.7%), loss of sensation in the lower limbs (50%), and pain at rest (44.4%). Despite this scenario, most participants did not undergo regular foot assessments by healthcare professionals. Clinical assessment of the diabetic foot revealed impaired protective sensation in more than half of the sample, as assessed by the monofilament test, in addition to dermatological changes and signs suggestive of peripheral neuropathy, reinforcing the high vulnerability of this population to the development of chronic complications.

The study made it possible to observe that the experience of symptoms is a complex process that triggers diverse and interconnected sensations, permeated by feelings, perceptions, and decision-making based on individuals' own clinical interpretations, affecting their lives, survival, treatment, and prevention of complications.

Unlike studies that separately describe clinical characteristics, metabolic indicators, or specific symptoms in individuals with type 2 *diabetes mellitus*, this study integrated quantitative and qualitative evidence to understand the experience of symptoms among older adults stratified as being at high risk. This approach demonstrated that symptoms are not limited to the physical manifestations of the disease but constitute a physical-emotional experience in which pain, fatigue, visual disturbances, and neuropathic symptoms are closely associated with feelings of concern, anxiety, uncertainty, and distress. By highlighting this interaction, the study broadens the understanding of the illness experience in this population and provides evidence to support nursing in developing multidimensional assessments and interventions centered on older adults, moving beyond exclusively biomedical approaches.

As an innovative contribution, this study shows that the experience of symptoms in older adults with type 2 diabetes who are classified as high risk should be understood as a physical-emotional phenomenon, highlighted by the integration of quantitative and qualitative findings. While the quantitative data allowed us to describe the clinical profile and identify the frequency of symptoms, the qualitative findings revealed their meanings and impact on daily life, producing a more comprehensive understanding of this population. This understanding provides evidence for developing assessment protocols and nursing interventions focused on older adults, contributing to holistic care, shared decision-making, and the prevention of complications.

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