



LIVING CONDITIONS, KNOWLEDGE AND SELF-CARE PRACTICES OF OLDER ADULTS WITH DIABETES MELLITUS: CROSS-SECTIONAL STUDY

CONDIÇÕES DE VIDA, CONHECIMENTO E PRÁTICAS DE AUTOCUIDADO DE IDOSOS COM DIABETES MELLITUS: ESTUDO TRANSVERSAL

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ABSTRACT: The objective was to analyze the living conditions, knowledge about Diabetes Mellitus (DM), and self-care practices of older adults assisted in Primary Health Care (PHC), in order to support more effective care strategies. This was a cross-sectional study conducted with 76 older adults (≥60 years) with type 1 or type 2 DM, registered in the HiperDia program in a municipality in the interior of São Paulo, Brazil. Sociodemographic and clinical questionnaires, the Diabetes Knowledge Questionnaire (DKN-A), and the Diabetes Self-Care Activities Questionnaire (QAD) were applied, and clinical data (height, weight, blood pressure, and abdominal circumference) as well as biochemical data (blood glucose and glycated hemoglobin) were collected. Descriptive analyses (frequencies and means) and inferential analyses (Mann-Whitney and Kruskal-Wallis tests) were performed to verify associations between sociodemographic variables, level of knowledge, and self-care practices. Most participants were female (63.2%), had low educational level (68.4% with elementary education), and monthly income of two to three minimum wages (53.9%). Only 13.2% showed adequate knowledge about DM. Adherence to self-care was heterogeneous, being high for medication use (84.2%) but low for physical activity (73.7% reported 0 days/week) and blood glucose monitoring (26.3%). Glycemic control was inadequate, with a mean blood glucose level of 186.05 mg/dL. Educational level was significantly associated with better dietary practices and physical activity ($p < 0.05$). It is concluded that older adults with DM assisted in PHC present insufficient knowledge and low adherence to essential self-care practices, especially physical activity and healthy eating, highlighting the need for accessible educational strategies and multiprofessional interventions that consider social determinants such as education and income.

KEYWORDS: Diabetes Mellitus. Aged. Self-Care. Primary Health Care. Health Education.

RESUMO: O objetivo foi analisar as condições de vida, o conhecimento sobre Diabetes Mellitus (DM) e as práticas de autocuidado de idosos atendidos na Atenção Primária à Saúde (APS), visando subsidiar estratégias de cuidado mais eficazes. Estudo transversal com 76 idosos (≥60 anos) com DM tipo 1 ou 2, cadastrados no programa HiperDia em um município do interior de São Paulo. Foram aplicados questionários sociodemográficos, clínicos, o Diabetes Knowledge Questionnaire (DKN-A) e o Questionário de Atividades de Autocuidado com o Diabetes (QAD). Dados clínicos (altura, peso, pressão e circunferência abdominal) e bioquímicos (glicemia, hemoglobina glicada) foram coletados. Foram realizadas análises descritivas (frequências, médias) e inferenciais (Mann-Whitney e Kruskal-Wallis) para verificar associações entre variáveis sociodemográficas, nível de conhecimento e práticas de autocuidado. A maioria dos participantes era do sexo feminino (63,2%), com baixa escolaridade (68,4% ensino fundamental) e renda de 2-3 salários mínimos (53,9%). Apenas 13,2% apresentaram conhecimento adequado sobre DM. A adesão ao autocuidado foi heterogênea: alta para medicação (84,2%), mas baixa para atividade física (73,7% relataram 0 dias/semana) e monitoramento glicêmico (26,3%). O controle glicêmico foi inadequado (glicemia média: 186,05 mg/dL). Escolaridade associou-se significativamente a melhores práticas alimentares e de atividade física ($p < 0,05$). Conclui-se que idosos com DM na APS apresentam conhecimento insuficiente e baixa adesão a práticas essenciais de autocuidado, especialmente atividade física e alimentação saudável. Estratégias educativas acessíveis e intervenções multiprofissionais são necessárias para melhorar o manejo da doença, considerando determinantes sociais como escolaridade e renda.

PALAVRAS-CHAVE: Diabetes Mellitus. Idoso. Autocuidado. Atenção Primária à Saúde. Educação em Saúde.

INTRODUCTION

Population aging is a global phenomenon that significantly impacts health systems, especially in developing countries such as Brazil¹. According to projections by the Brazilian Institute of Geography and Statistics (IBGE), by 2060, the Brazilian population aged 65 and over is expected to account for about 25.5% of the total population, surpassing the proportion of children and adolescents aged 0 to 14². This demographic transition brings a series of challenges, among them the increased prevalence of non-communicable chronic diseases (NCDs), with Diabetes Mellitus (DM) standing out as a condition whose prevalence and incidence rise with age, representing one of the main causes of morbidity and mortality in this age group³.

In Brazil, it is estimated that 16.8 million adults live with DM, with the prevalence among older adults exceeding 20%. This reflects not only clinical complications, such as cardiovascular, renal, and ophthalmological problems, but also negative impacts on quality of life, functionality, and independence in this age group⁴. Effective disease management therefore involves not only pharmacological interventions but also the continuous incorporation of self-care practices⁵.

In this context, self-care plays a central role in the management of DM, especially among older adults. Recommended practices include adherence to a healthy diet, regular physical activity, blood glucose monitoring, foot care, and correct use of medication. However, studies have shown that adherence to these practices is often unsatisfactory, particularly among the older adults, due to physical, cognitive, socioeconomic, and educational limitations^{6,7,8,9}.

Knowledge about the disease and its implications is recognized as a key factor for effective self-care. Individuals who have a better understanding of the disease, its complications, and the importance of control practices demonstrate greater ability to adhere to treatment. On the other hand, low educational attainment, common among Brazilian older adults, has been associated with unsatisfactory knowledge and negative attitudes toward self-care¹⁰.

In addition to knowledge, aspects related to living conditions, such as family income, access to health services, social support, occupation, and housing, directly affect the ability to maintain healthy habits and carry out preventive actions⁸. Studies indicate that older adults with lower income and lower educational levels face greater barriers to adequate disease management^{3,11}. To mitigate these obstacles, the National Health Promotion Policy (PNPS) recommends strategies to promote equity, intersectoral collaboration, strengthening of community networks, creation of healthy environments, and encouragement of popular health education, aiming to expand access to information, self-care practices, and conditions that favor healthy lifestyles, especially among socially vulnerable populations¹².

The role of Primary Health Care (PHC), through the Family Health Strategy (FHS) team, is essential in promoting health education and encouraging autonomy among older adults with DM¹³. However, the effectiveness of these actions rely on understanding the users' social and clinical profiles, as well as their real needs and potential for self-care¹⁴.

Given the relevance of this topic, few studies comprehensively integrate the social determinants of health, knowledge about DM, and adherence to self-care practices among older adults. This gap highlights the need for research that supports more equitable, personalized, and effective strategies for the care of this population¹⁵.

In light of the above, this study aims to analyze the living conditions, level of knowledge about the disease, and self-care practices of older adults with type 2 Diabetes Mellitus who are cared for in PHC. Understanding these dimensions enables health professionals to broaden their actions in developing person-centered, evidence-based care plans¹⁶.

METHODOLOGY

This is a cross-sectional, quantitative study guided by the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) tool and approved by the Research Ethics Committee of Marília Medical School (FAMEMA) under approval nº. 6.615.363 and CAAE 76178923.8.0000.5413. Data collection was carried out from March to June 2024 at the “Dr. Milton Gondim Pyles” Health Center III, located in Platina, a town located in western São Paulo state.

The study population consisted of older adults with DM who were registered in the e-SUS/SISAB system and followed up through the HiperDia program of the Family Health Strategy (FHS). Participants were selected through non-probabilistic convenience sampling, based on ease of access, availability, and willingness to participate in the study. Inclusion criteria were patients of both sexes, aged 60 years or older, diagnosed with type 1 or type 2 DM for more than six months, who agreed to participate in the study by signing the Free and Informed Consent Form (FICF). Exclusion criteria were the presence of cognitive or intellectual limitations that made prevented answering the study instruments, being bedridden or unable to move to participate in the study, moving to another city, falling ill, or withdrawing from participation.

For recruitment, a meeting was held with the Community Health Agents (CHAs) to explain the objectives and purposes of this study and to survey patients registered in the HiperDia Program, as well as to organize the invitation and the recruitment procedure. A total of 1,196 patients diagnosed with Hypertension and/or DM were identified through the HiperDia Program. From this population, only patients diagnosed with type 1 or type 2 DM (413) were selected, and then only those aged 60 years or older were included. The number of older adults with DM followed by the HiperDia Program totaled 129 patients.

Subsequently, invitations were delivered to the 129 older adults by the CHAs for each patient registered within their designated micro-area. The CHA would present the study and, if the older adult was interested in participating, the CHA would collect their phone contact. Afterwards, a phone call was made to schedule the date and time for participation. In cases where the older adult was not found during delivery of the invitation, a second attempt was made. If still not located, the patient was excluded from the study.

The data collection team was composed of the principal investigator and two previously trained health professionals, along with CHA linked to the FHS team, who carried out the active search for study participants. After agreeing to participate and signing the FICF, the data collection questionnaires were applied individually in a private room by a researcher who read the questions aloud and recorded the answers the interviewed older adult provided. After the questionnaires were completed, the participant was guided to undergo blood sampling for laboratory tests.

Three instruments were used to collect data: the first, developed by the researcher, covered sociodemographic variables (age, sex, marital status, race/ethnicity, education, income, family arrangement); clinical variables (duration of disease, use of insulin, type of treatment, weight, height, BMI, blood pressure, waist circumference); and biochemical variables (capillary blood glucose and glycated hemoglobin).

For biochemical evaluation, all participating older adults were instructed to maintain a minimum fasting period of 8 hours for analysis of fasting blood glucose and glycated hemoglobin levels. Between 5–10 ml of blood was collected via venous puncture from the cubital fossa at the health unit. Blood sample tubes were labeled with adhesive labels containing the participant's full name and date of birth, stored in thermal boxes with reusable ice packs, sealed, and transported for processing at a clinical analysis laboratory.

The second instrument used was the Diabetes Knowledge Questionnaire (DKN-A), a translated and validated version in Brazil, consisting of 15 multiple-choice items covering various aspects related to general DM knowledge. The questionnaire includes five broad categories: basic physiology; food groups and substitutions; DM management when other illnesses occur; general principles of disease care. The total score ranges from 0 to 15 points, with scores below seven indicating unsatisfactory knowledge and scores equal to or greater than eight indicating satisfactory knowledge¹⁷.

Finally, the Diabetes Self-Care Activities Questionnaire (QAD), also validated and culturally adapted in Brazil, was used. It contains 6 dimensions and 17 evaluation items that assess adherence to self-care activities among individuals with diabetes. Each item is scored on a scale from 0 to 7, corresponding to the number of days the behavior was performed during the previous week. Scores can be analyzed individually by item or aggregated by domain. For each domain, the mean of the items is calculated. The overall mean QAD score can be obtained by adding the domain means and dividing by the total number of domains evaluated. Higher scores (closer to 7) indicate greater adherence to self-care practices, while lower scores (closer to 0) indicate low adherence and a higher risk of diabetes-related complications¹⁸.

Data were analyzed using descriptive and inferential statistics. Categorical variables were presented as absolute and relative frequencies (%), while continuous variables were described by mean, standard deviation (SD), median, and interquartile range (IQR), according to the data distribution.

To assess the association between sociodemographic variables and the level of knowledge about Diabetes Mellitus (classified based on the DKN-A instrument score), odds ratios (OR) with their respective 95% confidence intervals (95% CI) were calculated. Fisher's exact test was applied when more than 20% of cells had expected values below 5.

Comparison of adherence to self-care practices (median/IQR of weekly frequency) between sociodemographic groups was performed using the Mann-Whitney test (for two groups) and the Kruskal-Wallis test (for three or more groups), adopting a significance level of 5% ($p < 0.05$). Analyses were performed using R Core Team software¹⁹.

RESULTS

During the study period, 129 older adults were recruited for eligibility assessment. Of these, 24 could not be located, 19 declined the invitation, and 13 were excluded based on the exclusion criteria. The final sample consisted of 76 older adults with DM, most participants were female (63.2%) and aged between 70 and 79 years (44.7%). The predominant education attainment was primary education (68.4%), and most self-identified as White (48.7%), followed by Black (31.6%). Regarding marital status, 43.9% were married and 36.8% widowed. Most older adults reported a monthly income between two and three minimum wages (53.9%) and lived with family members (75.0%).

Most participants had between one and three children (63.2%) and used oral medication (76.3%), with lower adherence to dietary and physical exercise practices (17.1%). Only 34.2% used insulin, and the time since diabetes diagnosis was 20 years or more for over half of the participants (56.6%) (Table 1).

The mean body mass index (BMI) was 30.06 kg/m² (SD±4.89), characterizing the sample as predominantly overweight or obese. The mean systolic blood pressure was 137.11 mmHg (SD±20.51) and the diastolic pressure was 81.18 mmHg (SD±10.95). The mean waist circumference was 102.74 cm (SD±10.54) for men and 98.76 cm (SD±14.10) for women. The mean blood glucose level was 186.05 mg/dL

(SD±79.89), indicating poor glycemic control. The mean hemoglobin level was 8.86 g/dL (SD±2.16), with minimum values as low as 5.2 g/dL (Table 2).

Table 1. Sociodemographic characteristics of older adults with Diabetes Mellitus (n = 76), Platina, São Paulo, Brazil, 2025.

Variables	Categories	N (%)
Gender	Male	28 (36,8)
	Female	48 (63,2)
Age Group	60 - 69	31 (40,8)
	70 - 79	34 (44,7)
	80 or older	11 (14,5)
Educational Attainment	Illiterate	17 (22,4)
	Primary	52 (68,4)
	Secondary	6 (7,9)
	Higher Education	1 (1,3)
Race/Ethnicity	White	37 (48,7)
	Mixed Race	15 (19,7)
	Black	24 (31,6)
Marital Status	Married	41 (43,9)
	Divorced	5 (6,6)
	Single	2 (2,6)
	Widowed	28 (36,8)
Individual Income	1 minimum wage	31 (40,8)
	2 - 3 minimum wages	41 (53,9)
	4 - 5 minimum wages	3 (3,9)
Lives with	Family Member (s)	57 (75,0)
	Alone	19 (25,0)
Number of Children	0	5 (6,6)
	1 - 3	48 (63,2)
	4 - 6	22 (28,9)
Uses Insulin	Yes	26 (34,2)
	No	50 (65,8)
Duration of Disease	< 10 years	3 (3,9)
	≥ 10 years	28 (36,8)
	≥ 20 years	43 (56,6)
Disease Management	Diet, Medication, and Physical Exercise	13 (17,1)
	Diet and Medication	58 (76,3)
	Medication only	5 (6,6)

Table 2. Minimum, maximum, and mean analysis of clinical and laboratory variables of older adults (n = 76), Platina, São Paulo, Brazil, 2025

Variables	Minimum	Maximum	Mean	SD±
Body Weight (kg)	49,00	103,00	76,00	12,83
Height (m)	1,36	1,79	1,59	0,10
BMI (kg/m ²)	20,30	41,30	30,06	4,89
Systolic Blood Pressure (mmHg)	100,00	220,00	137,11	20,51
Diastolic Blood Pressure (mmHg)	50,00	110,00	81,18	10,95
Male Waist Circumference (cm)	84,00	130,00	102,74	10,54
Female Waist Circumference (cm)	72,00	146,00	98,76	14,10
Blood Glucose (mg/dL)	80,00	453,00	186,05	79,89
Hemoglobin (g/dL)	5,20	15,20	8,86	2,16

Only 10 participants (13.2%) demonstrated adequate knowledge (score ≥8). No statistically significant associations were found between knowledge and variables such as sex, age, race/ethnicity, income, marital status, or insulin use (p>0.05). Regarding educational attainment, although the result

was not statistically significant ($p=0.09$; $OR=3.76$; 95% $CI: 0.73-19.3$), a higher odds ratio was observed for greater knowledge among older adults with higher educational attainment (Table 3).

Table 3. Association between sociodemographic variables and classification of knowledge about Diabetes Mellitus, according to DKN-A score ($n = 76$), Platina, São Paulo, Brazil, 2025.

Variables	Categories	Knowledge ≥ 8 (N = 10)	Knowledge < 8 (N = 66)	OR (CI 95%)	p-value
Sex	Male	5 (50%)	23 (34,8%)	1,87 (0,52 – 6,73)	0,34
	Female	5 (50%)	43 (65,2%)	1,00	
Age	≤ 70 years	5 (50%)	25 (37,9%)	1,65 (0,46 – 5,92)	0,44
	> 70 years	5 (50%)	41 (62,1%)	1,00	
Race/Ethnicity	White	6 (60%)	32 (48,5%)	1,59 (0,42 – 6,02)	0,50
	Non-white ¹	4 (40%)	34 (51,5%)	1,00	
Education	Incomplete primary education	8 (80%)	34 (51,5%)	3,76 (0,73 – 19,3)	0,09
	Complete primary education	2 (20%)	32 (48,5%)	1,00	
Income (Minimum wage)	≥ 2	6 (60%)	34 (51,5%)	1,41 (0,38 – 5,28)	0,61
	< 2	4 (40%)	32 (48,5%)	1,00	
Marital status	Married/Widowed	9 (90%)	57 (86,4%)	1,42 (0,16 – 12,8)	0,99
	Other (Divorced/Single)	1 (10%)	9 (13,6%)	1,00	
Insulin use	Yes	3 (30%)	24 (36,4%)	0,75 (0,17 – 3,25)	0,70
	No	7 (70%)	42 (63,6%)	1,00	

¹Non-white includes individuals who self-identified as Black, Brown, or other non-white racial groups. DKN-A: Diabetes Knowledge Questionnaire; OR: Odds Ratio; CI: Confidence Interval; p-value calculated using Fisher's exact test due to $> 20\%$ of cells with expected counts below 5. Source: Prepared by the author.

The most frequently reported self-care practices were taking medication as prescribed (84.2%) and taking the correct number of pills (86.8%), with a median of 7 days per week. On the other hand, practicing physical activity for at least 30 minutes (73.7%) and engaging in specific exercises (68.4%) had a median of 0 days, indicating low adherence. Only 26.3% reported monitoring blood glucose as recommended. Regarding foot care, although 84.2% reported examining their feet, only 34.2% examined the inside of their shoes. Adequate intake of fruits and vegetables was reported by only 26.3% of older adults (Table 4).

There was a positive association between educational attainment and greater adherence to general dietary practices ($p<0.01$), specific dietary practices ($p=0.02$), physical activity ($p=0.01$), and blood glucose monitoring ($p=0.01$), indicating that older adults with incomplete primary education showed better adherence to these practices. Adherence to blood glucose monitoring was also significantly higher among those who used insulin ($p=0.04$). No significant associations were found between adherence and variables such as sex, age, income, or marital status (Table 5).

Table 4. Distribution of older adults with diabetes mellitus according to adherence to self-care activities for disease management ($n = 76$), Platina, São Paulo, Brazil, 2025.

Diabetes Self-Care Activities	Frequency (days per week)		Median $\pm$ IQR
	0 to 4 days N (%)	0 to 4 days N (%)	
General Diet			
Follow a healthy diet	32 (42,1%)	44 (57,9%)	3 (2 – 4)
Follow dietary recommendations	30 (39,5%)	46 (60,5%)	3 (2 – 4)

Diabetes Self-Care Activities	Frequency (days per week)		Median ± IQR
	0 to 4 days N (%)	0 to 4 days N (%)	
Specific Diet			
Eat five or more servings of fruits and/or vegetables	56 (73,7%)	20 (26,3%)	1 (0 – 3)
Eat red meat and/or full-fat dairy products	22 (28,9%)	54 (71,1%)	4 (3 – 5)
Eat sweets	45 (59,2%)	31 (40,8%)	3 (0 – 4)
Physical Activity			
Engage in physical activity for at least 30 minutes	56 (73,7%)	20 (26,3%)	0 (0 – 2)
Perform specific physical exercises	52 (68,4%)	24 (31,6%)	0 (0 – 2)
Blood Glucose Monitoring			
Check blood sugar level	48 (63,2%)	28 (36,8%)	2 (0 – 7)
Check blood sugar as many times as recommended	56 (73,7%)	20 (26,3%)	1 (0 – 3)
Foot Care			
Examine feet	64 (84,2%)	12 (15,8%)	1 (0 – 2)
Check inside shoes before putting them on	26 (34,2%)	50 (65,8%)	5 (2 – 6)
Dry between toes after washing feet	38 (50,0%)	38 (50,0%)	5 (2 – 7)
Medication			
Take medications as prescribed	12 (15,8%)	64 (84,2%)	7 (6 – 7)
Take insulin injections as prescribed	62 (81,6%)	14 (18,4%)	0 (0 – 5)
Take the prescribed number of diabetes pills	10 (13,2%)	66 (86,8%)	7 (6 – 7)

Note: IQR = Interquartile Range.

Table 5.. Association between sociodemographic variables and adherence to self-care activities among older adults with diabetes mellitus, Platina, São Paulo, Brazil, 2025.

Variables	General diet	Specific Diet	Physical Activity	Blood Glucose Monitoring	Foot Care	Medication
	IQR* p-value**	IQR* p-value**	IQR* p-value**	IQR* p-value**	IQR* p-value**	IQR* p-value**
Sex						
Male (n = 28)	3 (2 – 4)	1 (0 – 3)	0 (0 – 2)	2 (0 – 7)	0 (0 – 2)	7 (6 – 7)
Female (n = 48)	3 (2 – 4)	1 (0 – 2)	0 (0 – 2)	2 (0 – 7)	1 (0 – 2)	7 (6 – 7)
	p = 0,62	p = 0,45	p = 0,33	p = 0,33	p = 0,91	p = 0,45
Age						
≤70 years (n = 30)	3 (2 – 4)	1 (0 – 3)	0 (0 – 2)	2 (0 – 7)	1 (0 – 2)	7 (6 – 7)
>70 years (n = 46)	3 (2 – 4)	1 (0 – 3)	0 (0 – 0)	2 (0 – 7)	1 (0 – 2)	7 (6 – 7)
	p = 0,52	p = 0,87	p = 0,21	p = 0,64	p = 0,75	p = 0,32
Educational attainment						
Incomplete Primary	4 (3 – 5)	2 (0 – 3)	2 (0 – 3)	3 (1 – 7)	1 (0 – 3)	7 (6 – 7)
Complete Primary	2 (1 – 3)	0 (0 – 2)	0 (0 – 0)	0 (0 – 3)	0 (0 – 2)	7 (5 – 7)
	p < 0,01	p = 0,02	p = 0,01	p = 0,01	p = 0,08	p = 0,12
Income (Minimum Wage)						
≥2 (n = 40)	3 (2 – 4)	1 (0 – 3)	0 (0 – 2)	2 (0 – 7)	1 (0 – 2)	7 (6 – 7)
<2 (n = 36)	3 (2 – 4)	1 (0 – 2)	0 (0 – 0)	1 (0 – 5)	0 (0 – 2)	7 (6 – 7)
	p = 0,15	p = 0,27	p = 0,09	p = 0,18	p = 0,23	p = 0,67
Insulin use						
Yes (n = 27)	3 (2 – 4)	1 (0 – 3)	0 (0 – 0)	3 (1 – 7)	1 (0 – 2)	7 (7 – 7)
No (n = 49)	3 (2 – 4)	1 (0 – 3)	0 (0 – 2)	2 (0 – 7)	1 (1 – 2)	7 (6 – 7)
	p = 0,88	p = 0,55	p = 0,12	p = 0,04	p = 0,91	p = 0,07

*Median and Interquartile Range (IQR). **Statistical tests: Mann-Whitney and Kruskal-Wallis as appropriate.

DISCUSSION

The results of this study highlight the significant persistent challenges in managing diabetes mellitus (DM) among older adults receiving care in primary health care settings, particularly regarding

disease knowledge and adherence to self-care practices. The low proportion of older adults with satisfactory knowledge (13.2%) aligns with the findings of Borba et al. (2019), who reported insufficient knowledge about DM in 77.7% of older adults, participants in primary care. This limitation, often associated with low educational attainment and informal health education processes, directly impacts autonomy and treatment adherence²⁰.

Although not statistically significant, the relationship between educational attainment and higher DM knowledge scores showed a relevant trend ($p = 0.09$), reinforcing the argument that social determinants of health, such as formal education, are central to understanding and managing chronic conditions²¹. According to Marques and Lemos (2018), low educational attainment is a direct predictor of limited health literacy, hindering the internalization of clinical guidance and the ability to self-manage²². This scenario demands more equitable public policies, with the development of educational materials and pedagogical strategies suited to the sociocultural profile of the older adults. Currently, initiatives such as home visits, educational groups, conversation circles, and workshops led by the Family Health Strategy (FHS), along with printed materials and actions from the National Health Promotion Policy, aim to enhance health literacy and promote self-care practices among older adults²³.

Health education is fundamental in the care of older adults with DM, as it fosters autonomy, self-care, and decision-making in disease management¹⁰. Understanding the pathophysiology of DM, glycemic control goals, risks of complications, and the importance of treatment adherence enables older adults to adopt healthier routines, such as balanced eating habits, physical activity, and blood glucose monitoring¹⁵. The educational approach should be continuous, accessible, and culturally sensitive, considering common limitations in cognition, vision, motor skills, and health literacy within this age group. When conducted through an interprofessional and person-centered lens, health education strengthens shared responsibility in care and contributes to the effectiveness of primary health care actions¹⁴.

Adherence to self-care practices was heterogeneous. While medication adherence was high (over 84%), practices such as physical activity, healthy eating, and glycemic monitoring were largely neglected. These findings are in line with those of Ferreira et al. (2022), who noted that medicalization dominates DM treatment in primary care, often at the expense of educational and interdisciplinary approaches. This pattern indicates that, despite advancements in Primary Health Care, care for older adults with DM remains predominantly focused on a biomedical model, emphasizing drug prescriptions, while educational strategies and interdisciplinary approaches to promote self-care remain undervalued. This scenario emphasizes the need to reorient healthcare practices by prioritizing health education and patient autonomy as central elements for effective disease management²⁴.

Regarding dietary practices, the study found statistically significant differences associated with educational attainment, with greater adherence to general dietary guidelines ($p < 0.01$) and specific dietary recommendations ($p = 0.02$) among older adult individuals with incomplete primary education. This finding partially contrasts with literature that typically associates higher education level with better self-care in nutrition. However, factors such as stronger relationships with healthcare teams, more frequent home visits, and family support may positively influence eating habits among less educated groups, particularly in small municipalities. These results highlight the importance of considering sociocultural context and support networks when planning educational strategies and nutritional interventions in primary care^{10,21}.

Another important point was the poor glycemic control observed in the sample (mean glucose level of 186 mg/dL), indicating increased risk for acute and chronic complications. This finding is consistent with Prates et al. (2021), who reported that only 32% of elder adult individuals in primary care

maintain adequate glycemic control²⁵. Ineffective self-care strategies and the lack of continuous and personalized follow-up contribute to this situation, requiring a review of longitudinal care protocols²⁶.

Physical activity was especially critical, with a median of zero days per week, making it one of the most neglected components of self-care. Studies have identified barriers such as fear of falling, physical limitations, comorbid conditions, lack of adequate public spaces, and safety concerns^{27,28}. Health teams must therefore prioritize encouraging physical activity and body movement, valuing public spaces for social interaction and health promotion, fostering social inclusion, strengthening autonomy among the older adults, and recognizing the right to leisure, especially given the epidemiological relevance of physical activity¹².

The demographic profile of the sample, mostly composed of older women with low educational attainment and modest income, highlights the strong influence of social determinants on DM self-care. Limited schooling and economic constraints hinder access to information, understanding of clinical guidance, and adoption of healthy practices, making disease management even more challenging for this group. In the studied primary care unit, the presence of follow-up through the HiperDia program and the work of FHS teams with clinical monitoring actions were observed, but no reports of participation by NASF (Family Health Support Center) teams were noted.

Regarding glycemic monitoring, a significant association with insulin use was observed, which is expected given the greater complexity of managing this subgroup. However, even among insulin users, adherence was partial. The Brazilian Diabetes Society (SBD) has previously warned that home glucose monitoring is still not a consolidated practice in the routine of Brazilian older adults, whether due to difficulties using the devices, lack of supplies, or insufficient guidance²⁹.

Foot care practices showed only partial adherence. Although 84.2% of participants reported inspecting their feet, only a few checked the inside of their shoes (34.2%), which can contribute to the risk of ulcers and amputations. As pointed out by Lima et al. (2023), foot self-care is one of the most neglected dimensions among older adults with diabetes, requiring specific interventions such as self-care workshops and follow-up by qualified health teams³⁰.

The results reinforce the strategic role of Primary Health Care, especially the Family Health Strategy, in promoting education for self-care. However, for educational actions to be effective, they must be centered on the user's reality, considering their limitations, values, and life context^{15,31}. Team training should include education in health using participatory methodologies, as recommended by the National Policy of Popular Health Education within the SUS³².

This study has some limitations that must be considered when interpreting the results. Due to the cross-sectional design, it is not possible to establish causal relationships between the analyzed variables. Additionally, the sample was non-probabilistic and limited to a single primary care unit in a small municipality, which limits the generalizability of the findings to other populations and contexts. Another point to consider is the uneven distribution of participants in some categories, such as educational attainment, which may have influenced the detection of statistical associations. Finally, data collection through face-to-face interviews may have led to response bias, as participants may have answered in a socially desirable manner, especially regarding self-care practices.

CONCLUSION

This study revealed that older adults with diabetes mellitus (DM) receiving care through primary health care (PHC) services in the town of Platina face significant limitations in their knowledge about the

disease and demonstrate low adherence to essential self-care practices necessary for glycemic control and complication prevention. The sociodemographic profile—characterized by low educational attainment and modest economic conditions—directly influences these outcomes. While adherence to pharmacotherapy was satisfactory, behaviors such as healthy eating habits, regular physical activity, and blood glucose monitoring remain weak.

The findings reinforce the need to strengthen health education actions within PHC, using more accessible, continuous, and culturally sensitive methodologies tailored to the realities of older adults. Ensuring access to necessary supplies, physical activity spaces, family support, and multiprofessional follow-up is essential to promote autonomy, safety, and well-being. The data also highlight the urgent need for investment in health team training, aiming for greater integration among health promotion, disease prevention, and individualized care.

Finally, this study contributes to a deeper understanding of the multiple dimensions involved in DM management among older adults, emphasizing that effective care requires addressing social inequities and practicing attentive, context-sensitive care within the territory. Future studies, particularly those with longitudinal and qualitative approaches, may enhance our understanding of the determinants that facilitate or hinder self-care, thereby supporting the development of more effective and equitable intervention strategies within the Brazilian Unified Health System (SUS).

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