

## Self-management of type 2 diabetes mellitus among older adults in an Ecuadorian community

Autogestão do diabetes mellitus tipo 2 em idosos de uma comunidade equatoriana

Autocontrol de la diabetes mellitus tipo 2 en adultos mayores en una comunidad ecuatoriana

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### ABSTRACT

**Introduction:** Diabetes mellitus is a chronic disease affecting millions of people worldwide. It is characterized by the body's inability to effectively regulate blood glucose levels, which leads to chronic hyperglycemia. **Objective:** To describe the self-control of type 2 diabetes mellitus in older adults in an Ecuadorian community. **Methods:** Quantitative, non-experimental, field, descriptive, and transversal approach. The "Diabetes Self-Management Questionnaire (DSMQ)" questionnaire was used and applied to 42 older adults. **Results:** 31% of the participants indicated that the control of blood sugar levels is applied to some extent in attending appointments with medical doctors, 52.4% said that this statement applies to a considerable degree when taking medication for diabetes, 61.9% of the participants indicated that it applies to a significant degree, in turn, in terms of the tendency to "binge eat", approximately 26.2% stated that this statement applies to some extent, the tendency to skip the planned physical activity, 54.8% said that this premise applies to a considerable degree, concerning the Perception of their diabetes self-control, approximately 35.7% indicated that it is applied to a certain extent. **Conclusion:** Improve self-control practices by favoring the reduction of complications related to the pathology, promoting autonomy and informed decision-making, and contributing to active aging and health in the population.

**Keywords:** Diabetes; glycemia; glycated hemoglobin; Ecuador; elderly; communities.

### RESUMO

**Introdução:** O diabetes mellitus é uma doença crônica que afeta milhões de pessoas em todo o mundo, caracterizada pela incapacidade do organismo em regular eficazmente os níveis de glicose no sangue, o que leva à hiperglicemia crônica. **Objetivo:** Descrever o autocontrole do diabetes mellitus tipo 2 em idosos de uma comunidade equatoriana. **Métodos:** Abordagem quantitativa, não experimental, de campo, descritiva e transversal. Foi utilizado o questionário "Diabetes Self-Management Questionnaire (DSMQ)", aplicado a 42 idosos. **Resultados:** 31% dos participantes indicaram que o controle dos níveis de açúcar no sangue é aplicado em alguma medida nas consultas médicas. disse que esta afirmação se aplica em grande medida, em relação à toma de medicamentos para a diabetes, 61,9% dos participantes indicaram que se aplica em grande medida, por sua vez, em termos de tendência para "comer compulsivamente", aproximadamente 26,2% afirmaram que esta afirmação se aplica até certo ponto à tendência de pular a atividade física planejada, 54,8% afirmaram que esta premissa se aplica em grau considerável, em relação à Percepção do seu autocontrole do diabetes, aproximadamente 35,7% afirmaram que ela é aplicada a um determinado extensão **Conclusão:** Melhorar as práticas de autocontrole favorecendo a redução de complicações relacionadas à patologia, promovendo a autonomia e a tomada de decisões informadas, contribuindo para o envelhecimento ativo e saudável da população.

**Palavras-chave:** Diabetes; glicemia; hemoglobina glicada; Equador; idosos; comunidades.

### RESUMEN

**Introducción:** La diabetes mellitus es una enfermedad crónica que afecta a millones de personas en todo el mundo, caracterizada por la incapacidad del cuerpo para regular eficazmente los niveles de glucosa en la sangre, lo que conlleva a una hiperglucemia crónica. **Objetivo:** Describir el autocontrol de la diabetes mellitus tipo 2 en adultos mayores en una comunidad ecuatoriana. **Métodos:** Enfoque cuantitativo, no experimental, de campo, descriptivo y transversal. Se empleó el cuestionario "Diabetes Self-Management Questionnaire (DSMQ)", aplicado a 42 adultos mayores. **Resultados:** 31% de los participantes indicó que el control de los niveles de azúcar en sangre se aplica hasta cierto punto, en la asistencia a citas médicas, el 52.4% refirió que esta afirmación se aplica en un grado considerable, en relación con la toma de medicación para la diabetes, el 61.9% de los participantes señaló que se aplica en un grado considerable, a su vez, en cuanto a la tendencia a tener "atracones de comida", aproximadamente el 26.2% manifestó que esta afirmación se aplica hasta cierto punto, la tendencia a saltarse la actividad física planificada, el 54.8% manifestó que esta premissa se aplica en un grado considerable, en relación con la percepción de su autocontrol de la diabetes aproximadamente el 35.7% manifestó que se aplica hasta cierto punto. **Conclusión:** Mejorar las prácticas de autocontrol favoreciendo la reducción de complicaciones relacionadas con la patología, fomentando la autonomía y la toma de decisiones informadas contribuyendo a un envejecimiento activo y saludable en la población.

**Palabras clave:** Diabetes; glicemia; hemoglobina glucosilada; Ecuador; adultos mayores; comunidades.

### ARTICLE HISTORY

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### ARTICLE INFORMATION

**Science-Matrix Classification (Domain):**

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**Main topic:**

Diabetes management in elderlies

**Main practical implications:**

This study highlights the need for enhanced self-management strategies in older adults with Type 2 diabetes, promoting autonomy and informed decision-making to improve health outcomes and reduce complications.

**Originality/value:**

Understanding how older adults with Type 2 Diabetes Mellitus manage their self-care is vital due to their high risk of complications. By evaluating their practices, we will identify areas for improvement and barriers to adherence. This study will provide key insights to inform effective intervention strategies and tailored educational programs for this population.

## INTRODUCTION

Diabetes mellitus is a chronic disease that affects millions of people worldwide. Characterized by the body's inability to effectively regulate blood glucose levels, leading to chronic hyperglycemia (Bonilla et al., 2023). The World Health Organization has projected that by 2030 the global prevalence of DM in all age ranges will reach 4.4% or a total of 366 million patients with diabetes (PAHO, 2023). In Ecuador, it is established that the prevalence of diabetes in adults between 20-79 years old, ranges from 4.7%, the number of adults (20-79 years old) with diabetes, in thousands, is considered to be 526.7; Finally, diabetes-related deaths in adults (20-79 years) is 3,970, highlighting the challenge faced by the government to adapt intervention strategies to the local situation and transform primary care services to address T2DM (Vasquez et al., 2022).

Type 2 diabetes mellitus (T2DM) is a variant of diabetes characterized by resistance to insulin, a key hormone in the regulation of blood glucose levels, and decreased insulin secretion by the pancreas (González et al., 2023). Unlike type 1 diabetes, which is usually diagnosed in childhood or adolescence and is related to autoimmune destruction of beta cells in the pancreas, T2DM generally develops in adulthood and is strongly associated with factors such as obesity, physical inactivity, unhealthy diet, and genetics. T2DM accounts for the vast majority of diabetes cases worldwide, making it a disease of global relevance (Marciano et al., 2019). Complications of T2DM can be severe and affect various body systems (Baroni et al., 2022). These complications include cardiovascular disease, neuropathy, nephropathy, retinopathy, as well as an increased risk of infections. In addition, T2DM is associated with an increased risk of other health problems, such as obesity, hypertension, and metabolic syndrome (Or et al., 2020; Cool Cedeño et al., 2024).

Internationally, type 2 diabetes mellitus is a growing epidemic. According to data from the International Diabetes Federation, approximately 90% of diabetes cases correspond to T2DM. In terms of mortality, diabetes is one of the leading causes of death worldwide (Buichia et al., 2021). In 2019, diabetes was estimated to have caused 4.2 million deaths globally (Accinelli et al., 2021). This disease burden is especially relevant in Latin America, where an estimated 9.3% of the adult population suffers from diabetes. Ecuador, in particular, is no exception to this worrying trend, with increasing diabetes prevalence rates and a significant impact on public health (González et al., 2020).

As life expectancy increases worldwide, an increase in the prevalence of T2DM is observed among older people (Santos et al., 2023). This increase in the population of older adults with diabetes poses unique challenges, as this demographic cohort often faces greater vulnerability to disease complications, such as cardiovascular disease, cognitive impairment, and physical disabilities (Yáñez et al., 2021). In addition, older adults often face additional barriers to self-care, such as polypharmacy and mobility limitations. This problem is exacerbated by the lack of diabetes awareness and self-care practices in this population, underscoring the need for diabetes-specific interventions and management strategies for older adults with T2DM (Krzemińska et al., 2021).

Self-management thus plays a crucial role in the management of T2DM, as patients must carry out practices such as glucose monitoring, adherence to a healthy diet, physical activity, and weight control (Mejorada et al., 2023). Adequate self-management is essential to maintain blood glucose levels within a target range and prevent long-term complications. In the older adult population, which often faces multiple comorbidities and functional limitations, self-care becomes an additional challenge (Gómez et al., 2022). Despite the various pharmacological options currently available, the prevalence of diabetes continues to increase. Studies have reported poor knowledge about the disease and its associated complications among people with disabilities and older adults not only in low- and middle-income countries but also in high-income countries (Zúñiga et al., 2023). Similarly, another study showed that poor disease knowledge is one of the main reasons for inadequate self-care behaviors and glycemic control. Likewise, another study determined that glycosylated hemoglobin (HbA1c) is a primary measure for glycemic control in older adults and people with disabilities (Bonilla et al., 2023). Consequently, poor glycemic control leads to increased mortality and serious complications such as kidney failure, myocardial infarction, stroke, retinopathy, hypertension, and many other associated micro and macrovascular complications (Vite et al., 2020).

Therefore, various studies have determined that effective diabetes self-management can be achieved through the following actions: lifestyle modification, diet control, regular physical exercise, smoking cessation, weight reduction, blood glucose self-monitoring, medication adherence, and foot care are effective treatments to improve the consequences of diabetes; so that adherence to self-care behavior and patient education are the first steps to help patients better care for and control their disease (Bukhsh et al., 2020). Consequently, it has been estimated that around 95% of diabetes treatment depends on self-care behaviors regardless of the type of diabetes and similarly patients and their families achieve self-care, so patients with diabetes must correct their behaviors such as compliance with prescribed medication, diet control and changes in diet and physical activity, especially in older patients, to prevent diabetes complications, which can be potentially lethal (Lee et al., 2019), being essential to understand and adequately address this disease, especially in the older adult population, given their greater vulnerability and risk of associated complications.

The objective of this research was to describe the self-management of type 2 diabetes mellitus in older adults in an

Ecuadorian community, the importance of this objective lies in the need to understand in depth how older adults with T2DM are addressing their self-care, especially in a population that faces a high risk of disease-related complications. By evaluating these practices, we seek to identify areas for improvement and understand the barriers that may be limiting adherence to self-care recommendations.

Moreover, we seek to provide quality information that can be used to develop intervention strategies and specific education programs for this population. Ultimately, this study aims to improve the quality of life of older adults with type 2 diabetes by promoting more effective self-care practices and, consequently, reduce the risk of complications, increase autonomy, and promote well-being at this stage of life.

## **METHODOLOGY**

The study was conducted using a quantitative approach with a non-experimental, field, descriptive and cross-sectional design. This involved collecting data at a specific time and analyzing it to describe the self-care practices of the population of older adults with type 2 diabetes mellitus (DM2). This study was conducted in the province of Tungurahua, canton of Ambato, parish of Picaihua with 42 people who were members of the Senior Citizens Club. The study population was limited to all senior citizens aged 60 years or older, who have been diagnosed with type 2 Diabetes Mellitus.

Inclusion criteria: Individuals over 60 years of age with a medical diagnosis of type 2 Diabetes Mellitus, who wish to participate in the research and who are part of the senior citizens club of the parish.

In order to maintain the integrity of the research, exclusion criteria were established: Individuals with additional serious chronic diseases, such as severe cardiovascular disease or cancer in advanced stages, people with serious cognitive difficulties, such as advanced dementia, which may limit their ability to provide accurate information, will also be excluded. Finally, any individual who did not give their written informed consent to participate in the study was excluded.

This research was evaluated and approved by the Ethics Committee of the Technical University of Ambato, which has an update and approval of the code of ethics according to resolution 0742-CU-P-2024. The study was conducted in accordance with strict ethical principles. Written informed consent was obtained from each participant, informing them about the purpose of the research, the procedures involved, and their rights as study subjects. Likewise, the confidentiality of the information collected was guaranteed, using numerical codes instead of real names to maintain the anonymity of the participants. This ethical procedure was essential to safeguard the privacy of the participants and protect the data obtained during the research, fully complying with the essential ethical principles of scientific research and fully respecting the rights of those who decided to participate in the study.

The data collection instrument selected for this study was the "Diabetes Self-Management Questionnaire (DSMQ)". This multidimensional questionnaire is used to obtain information on self-management behaviors related to type 2 diabetes mellitus (DM2) from the perspective of the respondents themselves. The DSMQ consists of self-descriptive statements that prompt participants to reflect on their self-care practices over the past few weeks and rate the extent to which each statement applies to them (Schmitt et al., 2022). The questionnaire uses a four-point response scale, ranging from 0, representing "does not apply to me," to 3, indicating "applies to me a lot." The questionnaire items address different aspects of self-care in type 2 diabetes, including adapting diet to the disease, consistency in taking medications, measuring/monitoring blood glucose levels or interstitial glucose, engaging in physical activity to improve diabetes control, and collaborating with the medical team or health care professionals who manage diabetes (Schmitt et al., 2022).

Participants' responses to each item are summed to obtain scores on five specific subscales: dietary behavior, taking medications, glucose monitoring, physical activity, and cooperation with the diabetes team. In addition, a total score can be calculated as an overall measure of diabetes self-management. To improve interpretability and comparability of scores, raw sum scores are transformed into a range from 0 to 10 (Schmitt et al., 2022). Importantly, the DSMQ has demonstrated its validity and reliability in previous studies in type 2 diabetes populations. It has been validated with a Cronbach's alpha coefficient ranging from 0.84 to 0.89, with a mean of 0.87, supporting its ability to accurately measure type 2 diabetes-related self-care practices. This instrument has been widely used in research on T2DM management and will provide a valuable database for this study (Schmitt et al., 2022).

The DSMQ questionnaire was an essential tool to assess self-care practices and diabetes management in the study population. The detailed results revealed patterns and trends in self-care practices, which helped to identify effective strategies and areas of needed focus in healthcare and health education. Data processing was carried out using SPSS statistical software, version 23. This statistical package was used to descriptively analyze the collected data with the aim of examining and summarizing the self-care practices of the participants in relation to their management of T2DM in the context of this study.

## RESULTS AND DISCUSSION

Table 1. Diabetes Self-Management Questionnaire (DSMQ) results

<b>I monitor my blood sugar levels carefully and attentively.</b>		
Items	Frequency	Percentage
Does not apply to me	11	26.2%
<b>Applies to me to some extent</b>	<b>13</b>	<b>31.0%</b>
Applies to me to a considerable degree	8	19.0%
Applies to me to a great extent	10	23.8%
<b>Total</b>	<b>42</b>	<b>100.0%</b>
<b>The foods I choose make it easier for me to achieve optimal blood sugar levels</b>		
Items	Frequency	Percentage
Does not apply to me	13	31.0%
<b>Applies to me to a certain extent</b>	<b>17</b>	<b>40.5%</b>
Applies to me to a considerable degree	12	28.6%
<b>Total</b>	<b>42</b>	<b>100.0%</b>
<b>I attend all the medical appointments recommended for the treatment of my diabetes</b>		
Items	Frequency	Percentage
<b>It applies to me to a considerable degree</b>	<b>22</b>	<b>52.4%</b>
It applies to me a lot	20	47.6%
<b>Total</b>	<b>42</b>	<b>100.0%</b>
<b>I take my diabetes medication (insulin, pills, etc.) as prescribed.</b>		
Items	Frequency	Percentage
<b>It applies to me to a considerable degree</b>	<b>26</b>	<b>61.9%</b>
It applies to me a lot	16	38.1%
<b>Total</b>	<b>42</b>	<b>100.0%</b>
<b>I occasionally eat a lot of sweets or other foods rich in carbohydrates.</b>		
Items	Frequency	Percentage
Does not apply to me	8	19.0%
Applies to me to some extent	11	26.2%
<b>Applies to me to a considerable degree</b>	<b>14</b>	<b>33.3%</b>
Applies to me to a great extent	9	21.4%
<b>Total</b>	<b>42</b>	<b>100.0%</b>
<b>I regularly record my blood sugar levels (or check the table of values with my blood glucose meter)</b>		
Items	Frequency	Percentage
Does not apply to me	11	26.2%
<b>Applies to me to a certain extent</b>	<b>17</b>	<b>40.5%</b>
Applies to me to a considerable degree	14	33.3%
<b>Total</b>	<b>42</b>	<b>100.0%</b>
<b>I tend to avoid diabetes-related medical appointments</b>		
Items	Frequency	Percentage
Does not apply to me	11	26.2%
Applies to me to some extent	10	23.8%
<b>Applies to me to a considerable degree</b>	<b>11</b>	<b>26.2%</b>
Applies to me to a great extent	10	23.8%
<b>Total</b>	<b>42</b>	<b>100.0%</b>
<b>I exercise regularly to achieve optimal blood sugar levels</b>		
Items	Frequency	Percentage
<b>Does not apply to me</b>	<b>19</b>	<b>45.2%</b>
Applies to me to a certain extent	9	21.4%
Applies to me to a considerable degree	14	33.3%
<b>Total</b>	<b>42</b>	<b>100.0%</b>
<b>I strictly follow the dietary recommendations of my doctor or diabetes specialist.</b>		
Items	Frequency	Percentage
Does not apply to me	10	23.8%
Applies to me to some extent	11	26.2%
<b>Applies to me to a considerable degree</b>	<b>13</b>	<b>31.0%</b>
Applies to me to a great extent	8	19.0%
<b>Total</b>	<b>42</b>	<b>100.0%</b>
<b>I don't check my blood sugar levels often enough to achieve good glycemic control</b>		
Items	Frequency	Percentage
Does not apply to me	7	16.7%
Applies to me to some extent	10	23.8%
Applies to me to a considerable degree	12	28.6%
<b>Applies to me to a great extent</b>	<b>13</b>	<b>31.0%</b>
<b>Total</b>	<b>42</b>	<b>100.0%</b>
<b>I avoid physical activity, even though it would improve my diabetes</b>		
Items	Frequency	Percentage
<b>Does not apply to me</b>	<b>11</b>	<b>26.2%</b>
Applies to me to some extent	10	23.8%
Applies to me to a considerable degree	10	23.8%
<b>Applies to me to a great extent</b>	<b>11</b>	<b>26.2%</b>
<b>Total</b>	<b>42</b>	<b>100.0%</b>
<b>I often forget to take or skip my diabetes medication (e.g. insulin, pills)</b>		
Items	Frequency	Percentage
Does not apply to me	12	28.6%
Applies to me to some extent	8	19.0%
<b>Applies to me to a considerable degree</b>	<b>16</b>	<b>38.1%</b>
Applies to me to a great extent	6	14.3%
<b>Total</b>	<b>42</b>	<b>100.0%</b>
<b>Sometimes I have real "eating binges" (not caused by hypoglycemia)</b>		
Items	Frequency	Percentage
It applies to me to a certain extent	11	26.2%
<b>It applies to me to a considerable degree</b>	<b>20</b>	<b>47.6%</b>
It applies to me a lot	11	26.2%
<b>Total</b>	<b>42</b>	<b>100.0%</b>
<b>Regarding my diabetes care, I should visit my doctor(s) more often.</b>		
Items	Frequency	Percentage
Does not apply to me	7	16.7%
Applies to me to some extent	11	26.2%
Applies to me to a considerable degree	10	23.8%
<b>Applies to me to a great extent</b>	<b>14</b>	<b>33.3%</b>
<b>Total</b>	<b>42</b>	<b>100.0%</b>
<b>I tend to skip planned physical activity</b>		
Items	Frequency	Percentage
<b>It applies to me to a considerable degree</b>	<b>23</b>	<b>54.8%</b>
It applies to me a lot	19	45.2%
<b>Total</b>	<b>42</b>	<b>100.0%</b>
<b>My diabetes self-care is poor</b>		
Items	Frequency	Percentage
<b>It applies to me to a certain extent</b>	<b>15</b>	<b>35.7%</b>
It applies to me to a considerable degree	11	26.2%
It applies to me a lot	16	38.1%
<b>Total</b>	<b>42</b>	<b>100.0%</b>

**Source:** Authors' development based on Schmitt (2022).

From the data analyzed (Table 1), it was determined that 25% of the participants indicated that monitoring blood sugar levels does not apply to them. 31% apply it to some extent, while 19% show a considerable degree of application. In addition, almost 24% stated that this statement applies to them a lot.

On the other hand, regarding attending medical appointments, 52.4% indicated that this statement applies to a considerable degree. Regarding taking diabetes medication, 61.9% of the participants indicated that this statement applies to a considerable degree.

Regarding occasional consumption of sweets and other carbohydrate-rich foods, 19% of the participants mentioned that this statement does not apply to them. On the other hand, regarding regular recording of blood sugar levels, approximately 26.2% indicated that this statement does not apply to them. Regarding the tendency to avoid diabetes-related medical appointments, about 26.2% indicated that this statement does not apply to them.

About regular physical activity, 45.2% indicated that this statement does not apply to them. However, regarding adherence to dietary recommendations, about 23.8% indicated that this statement does not apply to them. Regarding the frequency of monitoring blood sugar levels, about 16.7% indicated that this statement does not apply to them. On the other hand, regarding the avoidance of physical activity despite its benefit for diabetes control, about 26.2% indicated that this statement does not apply to them. Furthermore, regarding the tendency to forget or skip diabetes medication, about 28.6% indicated that this statement does not apply to them. In turn, regarding the tendency to have "binge eating", about 26.2% stated that this statement applies to some extent.

When looking at the perception of the need to visit their doctors more frequently for diabetes care, about 16.7% indicated that this statement does not apply to them. However, in relation to the tendency to skip planned physical activity, 54.8% stated that this statement applies to a considerable degree. Finally, the participants' responses regarding the perception of their diabetes self-care indicate that approximately 35.7% stated that this statement applies to some degree.

## **Discussion**

25% of participants do not consider blood sugar monitoring applicable, while 31% do it to some extent, and 19% show a considerable degree of application. Additionally, almost 24% indicated that this statement applies to them a lot. Moderate self-care practices prevailed in 42% of participants, while the majority of the study population exhibited poor self-care practices (52.6%). In a similar study in Iran, the majority of diabetic patients showed a low self-care score (63.6%). These results underline the need for educational and support strategies focused on improving self-care practices in older adults with type 2 diabetes to achieve more effective disease control (Buichia et al., 2021; Santos et al. 2023; Yáñez et al. 2021).

With respect to attendance at medical appointments, 52.4% indicated that this statement applies to a considerable degree. These findings are consistent with previous research on self-care in patients with diabetes, supporting the idea that regular attendance at medical appointments is a common and valuable practice in the management of this condition. These results are encouraging, as they demonstrate that the majority of participants are committed to receiving the necessary medical care for the treatment of their diabetes, which is essential for effective disease control and prevention of complications (Krzemińska et al., 2021; Mejorada et al., 2023).

About taking diabetes medication, 61.9% of participants indicated that this statement applies to a considerable degree. Although previous studies reported different figures, these results are highly positive, indicating that the majority of participants are committed to rigorously following their medication regimen. This is essential for effective diabetes control and prevention of long-term complications (González et al., 2020; Yáñez et al. 2021).

Concerning the occasional consumption of sweets and other carbohydrate-rich foods, 19% of participants mentioned that this statement does not apply to them. Among the various aspects of self-care practices, carbohydrate consumption was high in more than 70%. In another study, only 35.2% of participants showed satisfactory dietary practice. These results highlight the importance of nutritional education and ongoing support to promote healthy eating habits and limit the consumption of foods that may negatively affect blood sugar levels in people with type 2 diabetes (Gómez et al., 2022; Mejorada et al., 2023).

When asked about regularly recording blood sugar levels, approximately 26.2% indicated that this statement does not apply to them. In another study, 75.2% of the population had satisfactory blood sugar control. These results highlight the need to promote the importance of regular monitoring of blood sugar levels as an essential part of self-care in people with type 2 diabetes and to provide support to those who may need to improve their practices in this regard (Zúñiga et al., 2023; Bonilla et al., 2023).



Regarding the tendency to avoid diabetes-related medical appointments, approximately 26.2% indicated that this statement does not apply to them. In another study, about one-third of participants were from a rural area and faced difficulties in accessing health care services and education opportunities on managing their disease. These results underline the importance of addressing emotional and psychological barriers that may be affecting attendance at medical appointments and providing a healthcare environment that promotes confidence and comfort to improve diabetes management (Vite et al., 2020; Lee et al., 2019).

When analyzing the regular performance of physical activity, 45.2% indicated that this statement does not apply to them. In another study, the study population, in addition to daily life activities, only 19.2% did regular exercise, while 79.3% did not participate in regular exercise. These results underline the importance of promoting physical activity as a fundamental tool for diabetes control and the need to offer strategies to encourage and facilitate the incorporation of physical activity into the routine of people with type 2 diabetes (Buichia et al., 2021; Vite et al., 2020).

In adherence to dietary recommendations, about 23.8% indicated that this statement does not apply to them. Education and occupation were observed to play a significant role in influencing self-care practices. High-low socioeconomic class had a significantly higher risk of poor self-care practices. These results highlight the need for continued support and education on the importance of following dietary recommendations for diabetes management and promoting healthy eating habits (Baroni et al., 2022; Accinelli et al., 2021; Santos et al. 2023).

Regarding the frequency of monitoring blood sugar levels, about 16.7% indicated that this statement does not apply to them. In another study, the availability of personal glucometer at home was very low (11.9%). Similarly, the study revealed that on average only 15% of all patients were able to measure their blood glucose level at home. These results underline the importance of education and ongoing support in regular monitoring of blood sugar levels to achieve good glycemic control in people with type 2 diabetes (Baroni et al., 2022; González et al., 2020; Santos et al. 2023).

Concerning the avoidance of physical activity despite its benefit for diabetes control, about 26.2% indicated that this statement does not apply to them. Similar studies have revealed that a significant percentage of people with diabetes recognize the importance of physical activity, adopting healthy habits to improve glycemic control and promote their overall well-being. These results highlight the need to address barriers that prevent participation in physical activity and to provide support and motivation to those who may need to overcome obstacles to reap the benefits of physical activity in diabetes control (Buichia et al., 2021; Vite et al., 2020).

The tendency to forget or skip diabetes medication, about 28.6% indicated that this statement does not apply to them. In line with this, in this study patients with family or social support were more likely to have good diabetes self-care practices. These results underscore the need to address the relationship between emotions, eating behavior, and diabetes, and to provide support to manage binge eating in a healthy manner, as this behavior can have a negative impact on disease control (Mejorada et al., 2023; Bukhsh et al., 2020).

When analyzing the tendency to have "binge eating," approximately 26.2% stated that this statement applies to some extent. Consistent with previous research exploring eating behaviors in people with diabetes, these findings suggest that certain individuals face specific challenges in managing their food intake, which could negatively impact glycemic control and overall health. These results underscore the importance of communication between patients and healthcare professionals to determine the optimal frequency of medical visits, as well as providing support to ensure adequate follow-up of diabetes care (Yáñez et al. 2021; Vite et al., 2020).

Regarding the perception of the need to visit their doctors more frequently for diabetes care, about 16.7% indicated that this statement does not apply to them. These findings, in line with previous research, reflect the diversity of opinions among people with diabetes on the optimal frequency of medical consultations, highlighting the importance of considering individual preferences in planning health care. These results highlight the need to provide strategies and specific support to promote adherence to physical activity in this population, since physical activity is essential for diabetes control and overall health ((Marciano et al., 2019; Or et al., 2020; Accinelli et al., 2021).

The tendency to skip planned physical activity, 54.8% stated that this statement applies to a considerable degree. Different studies have shown that having a good or acceptable level of diabetes-related knowledge has been associated with good self-care practices. These results underline the importance of providing education, support and resources to help people with type 2 diabetes improve their self-care and, therefore, their control of the disease (Accinelli et al., 2021; González et al., 2020).

Therefore, a proposal for a diabetes mellitus self-management plan based on Dorotea Orem's self-care model can be argued, which proposes the practice of activities that people initiate and carry out by themselves to maintain life, health and well-being (Table 2).

**Table 2.** NOC-NIC INTERRELATIONSHIPS FOR: DIABETES MELLITUS

Result	Main interventions	Suggested Interventions	
<b>Diabetes self-management</b> <b>Definition:</b> Personal actions to control diabetes mellitus, its treatment, and to prevent the progression of the disease	Facilitate self-responsibility Improve self-confidence	Medication administration: oral Medication administration: subcutaneous Assistance in self-modification Infection control Exercise promotion	Hyperglycemia management Hypoglycemia management Medication management Nutritional monitoring
<b>Compliance behavior</b> <b>Definition:</b> Personal actions recommended by a health care professional to promote well-being, recovery, and rehabilitation	Facilitate self-responsibility Improve self-confidence	Increase coping Help in self-modification Anticipation guidance	Health system guidelines Cultural mediation Enhancing learning disposition
<b>Knowledge: diabetes control</b> <b>Definition:</b> Degree of understanding conveyed about diabetes mellitus, its treatment and prevention of complications	Teaching: Prescribed Diet Teaching: Prescribed Medications Teaching: Disease Process	Nutritional counseling Teaching: prescribed activity/exercise Teaching: foot care	Teaching: psychomotor skills Teaching: procedure/treatment
<b>Water balance</b> <b>Definition:</b> Water balance in the intracellular and extracellular compartments of the organism	Liquid management	Fluid/electrolyte management Fluid monitoring	Monitoring vital signs Monitoring
<b>Nutritional status</b> <b>Definition:</b> Capacity by which nutrients can cover metabolic needs	Nutritional counseling Nutritional monitoring	Help to lose weight Fluid management	Nutrition management Weight management
<b>Kidney function</b> <b>Definition:</b> Filtering blood and removing waste products of metabolism through the formation of urine	Interpretation of laboratory data Surveillance	Bedside laboratory analysis Acid-base management Urinary elimination management Sample management Weight management	Maintaining dialysis Access Electrolyte monitoring Fluid monitoring Peritoneal dialysis therapy Hemodialysis therapy
<b>Blood glucose level</b> <b>Definition:</b> Extent to which plasma and urine glucose levels are maintained within the normal range	Bedside laboratory analysis	Teaching: psychomotor skills Teaching: prescribed medications Interpretation of laboratory data	Hyperglycemia management Hypoglycemia management Blood sample capillary
<b>Response to medication</b> <b>Definition:</b> Therapeutic and adverse effects of prescribed medication	Teaching: Prescribed Medications	Bedside laboratory testing Management of hypoglycemia	Medication management Monitoring

**Source:** Authors' development based on Johnson (2012).

## FINAL REMARKS

The results of the assessment of the practices of patients with type 2 diabetes revealed significant variability in the degree of adherence to self-management behaviors. While a considerable percentage of participants demonstrated significant engagement in key areas, such as attending medical appointments and taking medication regularly, areas for improvement were also identified, such as regularly recording blood sugar levels and engaging in physical activity. This diversity in practices underlined the need for individualized approaches to promoting self-management, recognizing and addressing specific areas where patients may need further support.

The prevalence of poor self-management practices in more than half of the study population highlighted the importance of having implemented educational interventions and ongoing support in the management of type 2 diabetes in older adults. The identification of specific areas, such as frequency of monitoring blood sugar levels and poor physical activity, pointed to the need for strategies that address perceived barriers and encourage the adoption of healthier behaviors. These interventions could include structured education programs, visual aids, and reminders to promote consistency in self-management practices. The study provided a valuable foundation for planning future interventions aimed at improving self-management practices in older adults with type 2 diabetes. The identification of specific factors, such as the tendency to forget medication and compulsive food consumption, suggested specific areas of focus in education and ongoing support. Furthermore, the diversity in responses highlighted the need to consider individual patient characteristics when developing intervention strategies. Ultimately, addressing self-management practices from a holistic, patient-centered perspective may contribute to improving type 2 diabetes control in this population.

Furthermore, the study presented limitations in the diversification of the study population in the demographic and cultural context; as well as the need for the application of mixed methods that combine quantitative and qualitative data to offer a deeper understanding of the underlying factors that influence self-management practices. Another important aspect to consider in future research is the implementation of longitudinal designs that allow self-management practices to be assessed over a longer period of time and to examine their relationship with long-term health outcomes. This will provide valuable information on the effectiveness and sustainability of various self-management strategies in the management of type 2 diabetes in older adults. Ultimately, continued research in this area will contribute to the development of more personalized and effective interventions that address the specific needs of this vulnerable population.

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