

QUALITY OF LIFE IN OLDER PEOPLE WITH DIABETES MELLITUS

Camila Toledo Simas¹
Fábio Rodrigues Bengtsson²
Fabiano Maia Linhares³
Dara Brettas Veloso⁴
Bárbara Soares Pereira⁵
Flávio Renato Nunes do Amaral⁶
Geraldo José Coelho Ribeiro⁷

ABSTRACT: Objective: Compare the quality of life of diabetic older patients against patients without diabetes, using the Control, Autonomy, Self-realization and Pleasure (CASP-16) questionnaire. **Methods:** This is a cross-sectional observational study, consisting of 179 participants over 60 years of age admitted to a public University Hospital in Minas Gerais, Brazil. The researchers applied the CASP-16 scale, using a Google form, to these individuals, who signed the Informed Consent Form. The analyzes were carried out using Microsoft Excel and Jamovi software, with a significance level of 5%. The Certificate of Presentation of Ethical Appreciation of this study is (hidden information). **Results:** 55 (30.7%) patients living with diabetes and 124 (69.3%) without the disease were evaluated. Diabetic patients obtained lower CASP-16 values (26.6 ± 10.13) compared to non-diabetic patients (31.4 ± 11.34), with $p = 0.005$. Within the diabetic group, those who use insulin had a higher CASP-16 (29.0 ± 9.75) than those who do not use insulin (22.6 ± 9.66), with $p = 0.035$. **Conclusion:** Elderly patients admitted to the University Hospital with diabetes have a lower quality of life compared to patients without the disease. New studies can confirm this finding and contribute to a better understanding of this population, aiming to improve diabetes treatment.

Keywords: Diabetes Mellitus. Quality of Life. Aged. Insulin.

¹Acadêmica do curso de medicina da Faculdade de Ciências Médicas de Minas Gerais.

²Acadêmico do curso de medicina da Faculdade de Ciências Médicas de Minas Gerais.

³Acadêmico do curso de medicina da Faculdade de Ciências Médicas de Minas Gerais.

⁴Acadêmica do curso de medicina da Faculdade de Ciências Médicas de Minas Gerais.

⁵Acadêmica do curso de medicina da Faculdade de Ciências Médicas de Minas Gerais.

⁶Coorientador. Professor da Faculdade de Ciências Médicas de Minas Gerais.

⁷Orientador. Professor da Faculdade de Ciências Médicas de Minas Gerais.

RESUMO: Objetivo: Comparar a qualidade de vida de idosos diabéticos com pacientes sem diabetes, por meio do questionário Controle, Autonomia, Autorrealização e Prazer (CASP-16). **Métodos:** Trata-se de um estudo observacional transversal, composto por 179 participantes com mais de 60 anos internados em um Hospital Universitário público de Minas Gerais, Brasil. Os pesquisadores aplicaram a escala CASP-16, por meio de formulário do Google, a esses indivíduos, que assinaram o Termo de Consentimento Livre e Esclarecido. As análises foram realizadas nos softwares Microsoft Excel e Jamovi, com nível de significância de 5%. O Certificado de Apresentação de Apreciação Ética deste estudo é (informação ocultada). **Resultados:** Foram avaliados 55 (30,7%) pacientes que viviam com diabetes e 124 (69,3%) sem a doença. Os pacientes diabéticos obtiveram valores menores de CASP-16 ($26,6 \pm 10,13$) em comparação aos pacientes não diabéticos ($31,4 \pm 11,34$), com $p = 0,005$. Dentro do grupo diabético, quem faz uso de insulina apresentou maior CASP-16 ($29,0 \pm 9,75$) do que quem não faz uso de insulina ($22,6 \pm 9,66$), com $p = 0,035$. **Conclusão:** Pacientes idosos internados no Hospital Universitário com diabetes apresentam menor qualidade de vida em comparação aos pacientes sem a doença. Novos estudos podem confirmar esse achado e contribuir para um melhor conhecimento dessa população, visando melhorar o tratamento do diabetes.

Palavras-Chave: Diabetes Mellitus. Qualidade de vida. Idoso. Insulina.

1. INTRODUCTION

The prevalence of diabetes mellitus (DM) in older adults is growing worldwide, with an estimated value of approximately 20% in 2021 for people over 60 years (SUN *et al.*, 2022; SAEEDI *et al.*, 2019). In Brazil, the large variability of sociodemographic factors results in different values depending on the region studied. Diabetes prevalence ranges from 16% up to 21%, according to the age range for older adults (the former from 65 to 75 years and the later for 75+ years) (FRANCISCO *et al.*, 2022; VITÓI *et al.*, 2015). The estimated increase in prevalence of DM until 2045 in middle-income countries are higher (2,3%) compared to high income (1,3%) and low income countries (0,6%), which underlies the relevance of the disease and its complications and bring focus on the influence of sociodemographic factors on its morbidity (SUN *et al.*, 2022).

The impact of the disease on older adults is not constrained on the direct effects on the metabolism but also on the multiple chronic complications in different organs, such as kidney (diabetic nephropathy) and eyes (diabetic retinopathy) (KOLARIC, 2022). The high morbidity associated with diabetic patients directly impacts their quality of life (QoL) and brings impairments in multiple domains: social, cognitive, physical, emotional and economical (OLUCHI *et al.*, 2021). Although QoL cannot be precisely defined, since there

is not a uniform definition of the concept, it can be understood as an individual's perception of their position in life in relation to different factors associated with their expectations on life (OLUCHI *et al.*, 2021; HARALDSTAD *et al.*, 2019).

Different scales were developed to estimate de QoL in patients with or without diabetes, which includes: Diabetes quality of life (DQOL), with 46 items that covers four main domains; Diabetes obstacles questionnaire (DOQ), that covers 113 items; Diabetes quality of live clinical trial questionnaire (DQLCTQ), which is comprised of 142 items; Elderly diabetes burden scale (EDBS); Control, autonomy, self-realization and pleasure scale (CASP-19) (LIMA *et al.*, 2014; LIMA *et al.*, 2019; NERI *et al.*, 2018); and others (OLUCHI *et al.*, 2021; STONER, ORRELL, SPECTOR, 2018). The latter is validated in more than 20 different countries, including Brazil, and is commonly used in older adults with a range of chronic conditions and is compounded by 19 items that cover 4 different domains (control, autonomy, pleasure and self-realization). In Brazil, the CASP scale was validated and modified comprising 16 items covering the same domains (CASP-16) (STONER, ORRELL, SPECTOR, 2018).

Although multiple studies have established the impact of DM in quality of life in older adults, (YILDIRIM *et al.*, 2023; ZURITA-CRUZ *et al.*, 2018; MOKHTARI, GHESHLAGH, KURDI, 2019; JING *et al.*, 2018) there is a lack of studies that tries to estimate QoL in diabetic patients in Brazil using the CASP-16 scale. Further investigation is needed to understand how this condition impacts the experienced population in a middle-income country, mainly when using a country-validated scale. This study aims to evaluate the quality of life of older adults with diabetes in a Brazilian public hospital using the CASP-16 scale and compare with patients without this chronic condition.

2. Methods

Research type and sample

This is a cross-sectional observational study with patients admitted to a public Brazilian hospital. This manuscript was reported in accordance with the Strengthening the Reporting of Observational studies in Epidemiology (STROBE) statement.

The sample size was calculated with sampling error of approximately 5% and a confidence level of 95% for distribution of the population in a heterogeneous way, resulting

the minimum value of 147 patients. Data collection took place between March and April 2024 and comprehended by 179 participants.

To select participants, the following inclusion criteria were used: (1) age over 60 years; (2) admission to a Brazilian public hospital; (3) agree to the Free and Informed Consent Form (ICF) of their own free will; (4) and perform CASP-16. The exclusion criterion would be: (1) not being treated for DM, when comorbidity is present.

Data collection

The data were collected with the “CASP-16” questionnaire, who is made up to 16 items covering four key domains: control, autonomy, self-fulfillment and pleasure (LIMA *et al.*, 2014; LIMA *et al.*, 2019; NERI *et al.*, 2018). Besides that, individual's basic information was collected (gender, age, comorbidities and medications used).

Each item of the “CASP-16” had a Likert scale, ranging from "completely disagree" to "completely agree". The total score of the questionnaire ranges from 0 to 57, with higher scores indicating a better quality of life perceived by the seniors (LIMA *et al.*, 2014; LIMA *et al.*, 2019; NERI *et al.*, 2018).

Ethics

This study was approved by the Ethics and Research Committee of (hidden information). It was conducted on a voluntary basis, and written informed consent of all de participants were obtained before the study.

Data analysis

Categorical variables were presented as absolute and relative frequencies and numerical variables as mean \pm standard deviation and median (1st quartile – 3rd quartile). To compare means and medians between two groups, the Mann-Whitney test was used. Meanwhile, associations between categorical variables were evaluated using the Chi-square test and correlations between numerical variables using Spearman's Correlation Coefficient. The analyzes were carried out using Microsoft Excel and Jamovi software and a significance level of 5% was considered.

3. Results

The sample was made up of 179 older people, among them 89 (50.2%) were female and 88 (49.8%) were male, with an average age of 73.1 (\pm 6.9) years. Regarding the presence of DM, 55 (30.7%) individuals had the disease, while 124 (69.3%) participants did not have this comorbidity.

There was a significant relationship between QoL, age, the presence of diabetes mellitus and the use of insulin. About age, the older the participant, the higher the prevalence of DM and the lower the CASP-16 score. Regarding QoL, in general, diabetic patients have lower CASP-16 values, while, within the diabetic group, those who use insulin have higher values. The data can be seen in Tables 1, 2 and 3.

Table 1: Presence of diabetes mellitus and its relation to age and sex.

	Do you have diabetes?		p-valor
	No n = 124	Yes n = 55	
Sex			0,592*
Feminine	60 (67,4%)	29 (32,6%)	
Masculine	64 (71,1%)	26 (28,9%)	
Age	71,6 \pm 7,69 71,0 (65,0 – 77,3)	76,3 \pm 7,80 78,0 (71,0 – 82,5)	< 0,001 [†]

*Chi-square test; [†]Mann-Whitney test.

Table 2: Use of insulin in diabetics patients and its relation to age and sex.

	Do you use insulin?		p-valor
	No n = 21	Yes n = 34	
Sex			0,249*
Femine	9 (31,0%)	20 (69,0%)	
Masculine	12 (46,2%)	14 (53,8%)	
Age	77,8 ± 5,69 78,0 (74,0 – 82,0)	75,3 ± 8,80 77,0 (68,3 – 83,0)	< 0,391 [†]

*Chi-square test; [†]Mann-Whitney test.

Table 3: CASP-16 and its relation to age, sex, diabetes and use of insulin.

	CASP-16	p-valor
Sex		0,643 [†]
Femine	30,3 ± 10,8 32,0 (21,0 – 40,0)	
Masculine	29,5 ± 11,6 30,0 (22,0 – 38,0)	
Age	-0,588	< 0,001 [‡]
Do you have diabetes?		0,005 [†]
Yes n = 55	26,6 ± 10,13 27 (20,0 – 34,0)	

	No	31,4 ± 11,34	
	n = 124	34,0 (22,8 – 40,3)	
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Do you use insulin?			0,035 [†]
	Yes	29,0 ± 9,75	
	n = 34	29,5 (21,5 – 36,0)	
	No	22,6 ± 9,66	
	n = 21	25,0 (16,0 – 27,0)	

[†]Mann-Whitney test; [‡]Spearman's Correlation Coefficient.

4. DISCUSSION

The study found an inverse relationship between diabetes mellitus (DM) and QoL among patients over 60 years old admitted to a Brazilian public hospital. This aligns with Borges *et al.* (2019) research, involving 108 participants, which showed that chronic diseases such as systemic arterial hypertension and/or DM negatively impact QoL. Older individuals with DM scored lower compared to those with hypertension or no comorbidities (BORGES *et al.*, 2019). Additionally, chronic complications of DM significantly reduce QoL (KOLARIC, 2022). Effective glycemic control, crucial for preventing these complications, depends on factors like patients' socioeconomic status, social support, lifestyle habits, and treatment adherence (STOLAR, 2010).

Untreated diabetes mellitus leads to hyperglycemia, causing damage to microvascular circulation and resulting in complications such as retinopathy, nephropathy, and neuropathy. Neves *et al.* demonstrated that one in ten individuals with DM suffer from multiple complications, particularly affecting vision and kidneys (NEVES *et al.*, 2023). While not the primary causes of death among diabetics, these complications severely impair QoL, leading to extended hospital stays and loss of autonomy (KOLARIC, 2022).

The analysis carried out showed, in relation to diabetic patients, those using insulin obtained higher scores on the CASP-16, suggesting that these individuals have a higher quality of life. This finding differs from the results obtained in most of the available

literature. The study by Aviz *et al.*, for example, explains that multiple insulin injections are uncomfortable and result in daily life impairments and adverse effects, such as lipodystrophies and local infections. This has a negative impact on the QoL of insulin-dependent patients, with organic and psychological repercussions, which include dissatisfaction with treatment and anxiety. The authors also show that, in individuals with low income, the use of insulin has an even greater impact on QoL, as these patients have less access to self-monitoring resources, which provide greater comfort and better glycemic control (AVIZ *et al.*, 2021). One hypothesis that may explain this divergence is the fact that the present study was performed in a university hospital, where insulin is administered by experienced health professionals.

This study also found an increasing prevalence of DM with age, consistent with Segundo *et al.* epidemiological study where 52.22% of DM cases were aged 60 or older (SEGUNDO *et al.*, 2023). Another study that dialogues with the results found in this research is the integrative review by Ferreira *et al.* After analyzing 22 articles on QoL, the influence of age on the presence of DM was observed, which increases in direct proportion to aging (FERREIRA *et al.*, 2021). Over the years, there is a decline in insulin production and muscle mass, which leads to a decrease in the intake and consumption of glucose by the body, deregulating glycemic levels. Poor lifestyle choices such as an unbalanced diet and sedentary behavior exacerbate insulin resistance, potentially leading to diabetes mellitus over time (OLIVEIRA *et al.*, 2023).

These results, in addition to increasing the theoretical content on the topic, can serve as a starting point for subsequent studies with greater scope, for a deeper understanding of the population living with DM in the country. At a local level, a better understanding of the QoL of patients hospitalized with diabetes allows modifications to be made in the treatment of the disease, with a focus on health education and prevention of chronic complications of the disease.

The study had limitations. First, the sample composed of individuals over 60 years of age admitted to a Brazilian public hospital may not adequately represent older population in general, giving low external validity; the cross-sectional design limits the ability to establish a cause-and-effect relationship between the observed variables; and, at last, questionnaire-based data collection may be subject to memory and subjectivity biases, which can influence the accuracy of the results.

5. CONCLUSION

Patients over 60 years of age admitted to Brazilian public hospital with DM have a lower QoL compared to patients without the disease. This appears to be related to the chronic complications of DM. Therefore, a comprehensive and integrated approach is essential to optimize the health outcomes and well-being of older ones with diabetes mellitus, aiming at tertiary prevention, with adequate control of glycemic indexes to prevent the onset of possible complications and promote a better quality of life for these patients.

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