# Quality of life of patients with type 2 diabetes Mellitus

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## 1 INTRODUCTION

Diabetes mellitus (DM) is the fastest growing chronic condition, especially in developing countries, becoming a public health problem due to population aging, greater urbanization, the increasing prevalence of obesity and sedentary lifestyle, as well as the longer survival of people with diabetes (CORTEZ *et al*., 2015). In 2021, according to the *International Diabetes Federation*, there were **537** million adults (20-79 years) with DM, which represents 1 in 10 individuals. The prevalence of diabetes in Brazil, according to data from the Surveillance of Risk and Protective Factors for Chronic Diseases by Telephone Survey-VIGITEL, in 2016, was 8.9% of the population and, in Goiânia/Goiás, the site of this research, it was 7.6%, with an increase in the number of people with diabetes with advancing age and declining schooling (BRASIL, 2017).

DM is characterized by a group of metabolic diseases, which follows with hyperglycemia, with complications and changes in the functioning of various organs (SOCIEDADE BRASILEIRA DE DIABETES, 2019). It is considered a chronic disease in which there are changes in the metabolism of carbohydrates, lipids, proteins and micronutrients, resulting in persistent hyperglycemia (ROHM *et al*., 2022). Diabetes can be classified into type 1 diabetes mellitus (DM1), type 2 diabetes mellitus (DM2), gestational diabetes mellitus (DMG) and other types (SOCIEDADE BRASILEIRA DE DIABETES, 2019).

DM2 corresponds to a syndrome of multiple etiology and is characterized by a lack of insulin and/or a defect in its action. It is a polygenic disease, with strong family inheritance, where there is a significant occurrence of environmental factors, such as eating habits and lack of physical activity, among others, aggravated by advanced age and with a great contribution of obesity. Obesity increases the prevalence of diabetes due to poor eating habits, causing the disease, which was previously restricted to individuals over 40 years of age, to also affect children and adolescents (BRAZILIAN DIABETES SOCIETY, 2019).

DM2 corresponds t o  90 to 95% of all D M  cases. It begins, in most cases, asymptomatically or oligosymptomatically, where the diagnosis occurs through laboratory tests (BRAZILIAN

DIABETES SOCIETY, 2019). In the early stages of the disease, complications are recurrent hyperglycemia, resulting in diabetic ketoacidosis and hyperosmolar coma. In the chronic phases, it is the changes resulting mainly from macro and microvascular changes, such as retinopathy, nephropathy, ischemic heart disease, cerebrovascular disease and peripheral vascular disease and neuropathic ones, which increase the morbidity and mortality of these individuals (SANTOS *et al*., 2015).

The recommended treatment, in order to reduce complications and mortality, occurs through strategies involving health education and the use of drugs. Treatment options, however, need to be individualized according to the patient's clinical and socioeconomic characteristics, considering the risk of hypoglycemia, tolerability, adverse effects and cost. In non-pharmacological treatment, the importance of guidance on lifestyle changes is emphasized, such as increasing or including physical activity in daily life, changes in eating habits, routine management, sociability, among others, adopting healthy habits. In pharmacological treatment, when necessary, oral or injectable antidiabetics and/or insulin are used, whose goal is to achieve glycemic levels close to normal (BRAZILIAN DIABETES SOCIETY, 2022).

Early mortality from diabetes in most countries is related to its complications. In 2021, diabetes accounted for 6.7 million deaths, which means the death of one person every five seconds (INTERNATIONAL DIABETES FEDERATION, 2021). However, this number may be even higher since, in the death certificate, DM is not listed as a primary cause, but its complications, such as cardiovascular diseases (SOCIEDADE BRASILEIRA DE DIABETES, 2019).

Knowing how the disease affects the physical, psychological and emotional state and, finally, the quality of life of the population is fundamental, since, in this way, it is possible to carry out more effective interventions and monitor those already carried out (FARIA *et al*., 2013).

## 2 OBJECTIVE

To estimate the perceived quality of life of patients with type 2 diabetes mellitus.

## 3 METHODOLOGY

This is a cross-sectional observational study conducted between August 2018 and May 2019, with patients diagnosed with DM2 attended by the Endocrinology and Nutrition outpatient clinic in endocrinology at the Hospital das Clínicas of the Federal University of Goiás (HC/UFG). The inclusion criteria were age between 25 and 95 years. Patients with any mental illness, such as panic disorder, schizophrenia, depression, mental disorders, which would in any way impair the evaluation, were excluded.

At the time, the endocrinology outpatient clinic of HC/UFG treated an average of 1,000

patients/year with DM 2. Considering a reliability of 90% and an error of 10%, a sample of 64 patients was obtained.

The information was collected by previously trained researchers while waiting for medical or nutritional care. A structured questionnaire was applied containing the following socioeconomic and demographic information: name, gender (female and male); age (in completed years on the date of data collection); origin (Goiânia, Interior, other state); family composition; work situation (employed, unemployed, retired, health leave, housewife, student, informal or other); schooling (illiterate, incomplete elementary school, complete elementary school, incomplete high school, complete high school, incomplete higher education, complete higher education); family income in minimum wage (R$ 937.00), in the year of the interview.

The biochemical tests obtained from medical records were fasting blood glucose and glycated hemoglobin (HbA1c), with reference values as recommended by the Brazilian Diabetes Society (2022).

The DQOL-Brazil instrument, nationally validated by Correr *et al*. (2008), was used to verify quality of life (QOL). This instrument consists of 44 multiple-choice questions organized into four domains: "Satisfaction" (15 questions), "Impact" (18 questions), "Social/vocational concerns" (7 questions) and "Diabetes-related concerns" (4 questions). Responses are organized on a 5-point scale. "Satisfaction" is distributed on an intensity scale (1= very satisfied; 2= fairly satisfied; 3= medium satisfied; 4= not very satisfied; 5= not at all satisfied). The responses of the "Impact" and "Concerns" domains are distributed on a frequency scale (1= never; 2= almost never; 3= sometimes; 4= almost always; 5= always). In these scales, the closer the result is to 1, the better the quality of life assessment (CORRÊA *et al*., 2017).

Data were tabulated in a Microsoft Excel spreadsheet and analyzed using the SPSS statistical package, version 22.0. The dependent variable was quality of life, categorized as best QOL ($\geq 2.02$) and worst QOL ($< 2.02$). Analyses were performed using mean, standard deviation and absolute frequency.

The Informed Consent Form (ICF) was obtained according to Resolution 466, of December 12, 2012, of the National Research Ethics Committee of the Ministry of Health for procedures involving human beings (BRASIL, 2012). All evaluations adopted by the research entitled "Quality of life of patients with type 2 diabetes mellitus" were approved by the Research Ethics Committee of UFG, under opinion number 2,368,632, CAAE: 72737317.9.0000.5083.

## 4 RESULTS AND DISCUSSION

Sixty-four patients aged between 25 and 95 years (mean = 63.2 years) participated in the study. The majority (65.6%) were female. Regarding origin, 59.4% lived in Goiânia and 34.4% in the interior

of the state of Goiás. Among those surveyed, 48.4% reported a family composition of only two people and the average family income was one minimum wage (R$937.00) at the time. When questioned about their work, 50.0% of the interviewees were retired and had attended only incomplete elementary school (51.6%).

The data obtained are consistent with the profile of individuals with DM, generally women, aged between 60 and 65 years (CORRÊA *et al*., 2017). This fact can be explained, among other factors, by the female population seeking health services more frequently (SALIN *et al*., 2019). Similar values were found by Caldas *et al*. (2018), where the majority (51.0%) of patients were over 60 years old, mean of 59.66 years, and 63% were women with an average family income of one minimum wage. Most also reported that they were retired and 44% had not completed high school.

Only 64.7% of respondents had fasting blood glucose and HbA1c values available in their medical records. Of these, most individuals had fasting glucose < 200 (39.1%) and, although 28.1% had HbA1c according to the target, 31.3% had values between 8 and 10%.

It is noted that these values are above what is considered good glycemic control (BRAZILIAN DIABETES SOCIETY, 2022). Biochemical tests are of fundamental importance for DM control and it is through these markers that the professional will guide the treatment in addition to evaluating its effectiveness. Avelar (2015) and Salin *et al*. (2019) report that poor adherence to treatment has several causes, such as: unemployment and socioeconomic environment, illiteracy, lifestyle habits, misinformation, difficulty in drug follow-up at the health unit, side effects, forgetfulness, among others. It is noteworthy that chronic hyperglycemia, linked to the lack of glycemic control, can generate several micro and macrovascular complications, which burden treatment and make it even more difficult, not only for the affected population, but also for the public authorities, which funds the treatments (NILSON *et al*., 2020).

Regarding the results of the DQOL-Brazil questionnaire, when patients were asked about aspects of the "Satisfaction" domain, the answer that most individuals reported was that they were "Very Satisfied" with life in general. However, when asked "Are you satisfied with the apprehension that your diabetes generates in your family?", 1/3 (27%) of the individuals answered that they were "Not at all satisfied".

In the "Impact" domain, when asked "How often do you feel embarrassed to tell others about your diabetes?", the majority (59.37%) of respondents answered "Never". However, the answer to the question "How often do you feel uncomfortable having diabetes?", 71.87% of the patients answered "Always".

When asked "How often do you worry that someone will not go out with you because of your diabetes?", the majority answered "Never" (85.93%). When asked "How often do you worry that you will have complications because of your diabetes?", 42.18% answered "Always".

Through each domain of the study, it is possible to observe important characteristics, which will guide how much the disease has affected the various aspects of the individual's life. In almost all domains, an average of responses greater than two was found (Table 1), however, Corrêa *et al*. (2017) reported that, for specialized care, it is considered better QOL when the variable is < 2.02 and worse QOL when > 2.02. Therefore, it is noted that these patients had values above 2.02 in all domains, except for the domain " Social and vocational c o n c e r n s " (< 1.33). This can be explained by the age of the research participants, where aspects related to social and work events are no longer mistakenly considered so important at this stage of life. Similar values were found by Vignoli and Mezzomo (2015), where the social/vocational domain had the least impact, followed by "Diabetes-related concerns" and the "Satisfaction" domain.

Table 1. A v e r a g e s of the domains of the DQOL-Brazil quality of life instrument of the research participants. Goiânia, GO, 2019.

| Domains | Average | Standard Deviation | 95% CI |
|---|---|---|---|
| Satisfaction | 2,33 | 0,89 | 2,08-2,52 |
| Impact | 2,41 | 0,87 | 2,16-2,60 |
| Social and vocational concerns | 1,33 | 0,68 | 2,16-2,60 |
| Diabetes-related concerns | 2,36 | 0,99 | 2,09-2,57 |
| **General** | 2,75 | 0,72 | 1,97-2,33 |

The domain with the highest mean was "Impact", and the questions that had answers closest to five were "How often do you feel that because of diabetes you go to the toilet more than others?", "How often do you feel physically ill?" and "How often do you eat something you shouldn't, instead of saying you have diabetes?". These questions demonstrated that some signs and symptoms of DM, such as polyuria and muscle weakness, affect the QoL of these patients.

Another fundamental aspect in this context was related to diet, which should be worked on both from a preventive and treatment point of view, with nutritional guidance being the main tool for better blood glucose control (SOCIEDADE BRASILEIRA DE DIABETES, 2022). Adherence to nutritional guidelines is not always satisfactory, they happen without the participation of the nutritionist, without a previous assessment of eating habits, causing the composition of the diet to worsen. Thus, the need for individualized intervention remains, with the acquisition of healthy eating habits to obtain, especially, the glycemic improvement of DM2 patients (de OLIVEIRA *et al*., 2017).

Another domain that stands out for the value found was "Concerns about diabetes" ( 2 . 3 6 ) and the main question was "How often do y o u worry if you will have complications due to your diabetes?". The study by Bernini *et al*. (2017) showed that this domain had the greatest impact on patients' QoL. This fact reveals that there is the assimilation of information focused on the possible complications of the disease, but this concern does not modify self-care. According to Muzy *et al*. (2021), the most common estimated prevalence of DM complications, according to the triangulation

between the National Health Survey (PNS), the National Program for Improving Access and Quality of Primary Care (PMAQ-AB), data from the Popular Pharmacy and estimating, for Brazil, a DM prevalence of 9.2%, are 3% of neuropathy and 2% of retinopathy. Women had a higher prevalence of these complications compared to men. However, regarding the prevalence of blindness and incidences of diabetic foot, amputation and nephropathy, these percentages were higher for men.

## 5 CONCLUSION

We conclude that DM2 affects a population in conditions of vulnerability, women, elderly people with low income and low education. Some aspects that revolve around the disease, such as dissatisfaction related to symptoms, complications of the disease and difficulties in adhering to treatment, negatively influence the quality of life of patients treated at the endocrinology and nutrition outpatient clinics of HC/UFG.

Although it is a cross-sectional study, the characterization of this population showed that knowing the life context of those being treated is also to know the best form of treatment and thus provide a good quality of life.

# REFERENCES

AVELAR, F. A. Baixa adesão ao tratamento e controle do diabetes mellitus na unidade de saúde da família vila pérola, equipe 84, Contagem - MG: plano de intervenção. 2015. 34 f. Trabalho de conclusão de curso (Especialização) — Curso de Especialização em Atenção Básica à Saúde da Família, Universidade Federal de Minas Gerais, Belo Horizonte, 2015.

BERNINI, L. S.; BARRILE, S. R.; MANGILI, A. F.; ARCA, E. A.; CORRER, R.; XIMENES, M. A.; NEVES, D.; GIMENES, C. O impacto do diabetes mellitus na qualidade de vida de pacientes da Unidade Básica de Saúde/The impact of diabetes mellitus on the quality of life of patients of Primary Health Care. Cadernos Brasileiros de Terapia Ocupacional. São Carlos, v. 25, n. 3, p. 533-541, 2017.

BRASIL. Ministério da Saúde. Conselho Nacional de Saúde. Resolução n. 466, de 12 de dezembro de 2012. Aprova Diretrizes e normas regulamentadoras de pesquisas envolvendo seres humanos. Brasília, Diário Oficial da União, 12 dez. 2012.

BRASIL. Ministério da Saúde. Vigitel Brasil 2016: vigilância de fatores de risco e proteção para doenças crônicas por inquérito telefônico: estimativas sobre frequência e distribuição sociodemográfica de fatores de risco e proteção para doenças crônicas nas capitais dos 26 estados brasileiros e no Distrito Federal em 2016– Brasília: Ministério da Saúde, 2017.

CALDAS, A. C. S.; MORAIS, M. M. P.; NUNES, F. D. O., DIAS, R. S.; SOUSA, S. D. M. A. Caracterização dos pacientes diabéticos atendidos no ambulatório de umhospital universitário/characteristics of diabetic patients served in the ambulatory of a university hospital. Revista de Pesquisa em Saúde. São Luís, v. 18, n. 1, p. 41-44, 2018.

CORRÊA, K; GOUVÊA G. R.; SILVA, M. A. V.; POSSOBON, R. F.; BARBOSA, L. F. L. N.; PEREIRA, A. C.; MIRANDA, L. G.; CORTELLAZI, K. L. Qualidade de vida e característica dos pacientes diabéticos. Ciência e Saúde Coletiva. Rio de Janeiro,v. 22, n. 3, p. 921-930, 2017.

CORRER, C. J.; PONTAROLO, R; MELCHIORS, A. C.; ROSSIGNOLI, P.; FERNÁNDEZ-LLIMÓS, F.; RADOMINSKI, R. B. Arq Bras Endocrinol Metab., v. 52, n. 3, 2008. DOI: https://doi.org/10.1590/S0004-27302008000300012

CORTEZ, D. N.; REIS, I. A.; SOUZA, D. A.; MACEDO, M. M; TORRES, H. C. Complicações e o tempo de diagnóstico do diabetes mellitus na atenção primária. Acta Paulista de Enfermagem. São Paulo, v. 28, n. 3, p. 250-255, 2015.

FARIA, H. T. G.; VERAS, V. S.; XAVIER, A. T. F.; TEIXEIRA, C. R. S.; ZANETTI, M. L.; SANTOS, M. A. Qualidade de vida de pacientes com diabetes mellitus antes e após participação em programa educativo. Revista da Escola de Enfermagem USP. São Paulo , v. 47, n. 2, p. 348-354, 2013.

INTERNATIONAL DIABETES FEDERATION. IDF Diabetes Atlas 2021. 10 ed. Disponível em: https://diabetesatlas.org/. Acesso em 9 abr. 2023.

MUZY, J.; CAMPOS, M. R.; EMMERICK, I.; da SILVA, R. S.; SCHRAMM, J. M. A. Prevalência de diabetes mellitus e suas complicações e caracterização das lacunas na atenção à saúde a partir da triangulação de pesquisas. Cad. Saúde Pública, v. 37, n. 5, p. e00076120, 2021.

NILSON, E. A. F.; ANDRADE, R. C. S.; BRITO, D. A.; OLIVEIRA, M. L. Custos atribuíveis a obesidade, hipertensão e diabetes no Sistema Único de Saúde, Brasil, 2018. Rev Panam Salud Publica. v. 44, e32, 2020. DOI: https://doi.org/10.26633/RPSP.2020.32

de OLIVEIRA, L. M. S. M.; de SOUZA, M. F. C.; de SOUZA, L. A.; MELO, I. R. da C. Adesão ao tratamento dietético e evolução nutricional e clínica de pacientes com diabetes mellitus tipo 2. HU Rev [Internet]. v. 42, n. 4, p. 277-82, 2017. Disponível em: https://periodicos.ufjf.br/index.php/hurevista/article/view/2488

ROHM, T. V.; MEIER, D. T.; OLEFSKY, J. M.; DONATH, M. Y. Inflammation in obesity, diabetes, and related disorders. Immunity. v. 55, n. 1, p. 31-55, 2022. DOI: 10.1016/j.immuni.2021.12.013.

SALIN, A. B.; BANDEIRA, M. S. N.; FREITAS, P. R. N. de O.; SERPA, I. Diabetes Mellitus tipo 2: perfil populacional e fatores associados à adesão terapêutica em Unidades Básicas de Saúde em Porto Velho-RO. Revista Eletrônica Acervo Saúde, v. sup. 33, e1257. DOI: https://doi.org/10.25248/reas.e1257.2019

SANTOS, S.; BEÇA, H.; MOTA, C. L. D. Qualidade de vida e fatores associados na diabetes mellitus tipo 2: estudo observacional. Revista Portuguesa de Medicina Geral e Familiar. Barão do Corvo, v. 31, n. 3, p. 186-196, 2015.

SOCIEDADE BRASILEIRA DE DIABETES. Diretrizes da Sociedade Brasileira de Diabetes. Rio de    Janeiro, 2019- 2020.        Disponível em: https://www.diabetes.org.br/profissionais/images/2017/diretrizes/diretrizes-sbd-2017-2018.pdf>. Acesso em 9 abr. 2023.

SOCIEDADE BRASILEIRA DE DIABETES. Diretrizes da Sociedade Brasileira de Diabetes 2022.                                    Disponível em: https://diretriz.diabetes.org.br/. Acesso em 9 abr. 2023.

VIGNOLI, L. M. C. S. L.; MEZZOMO, T. R. Consumo alimentar, perfil nutricional e avaliação do DQOL-Brasil de portadores de diabetes. RBONE-Revista Brasileira de Obesidade, Nutrição e Emagrecimento. São Paulo, v. 9, n. 54, p. 225-234, 2015.