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ELDERLY PEOPLE'S LIFE EXPECTANCY WITH DIABETES MELLITUS TYPE II COMPLICATIONS

ESPERANÇA DE VIDA EM PESSOAS IDOSAS COM COMPLICAÇÕES DO DIABETES MELLITUS TIPO II

ESPERANZA DE VIDA DE LAS PERSONAS ANCIANAS CON COMPLICACIONES DE DIABETES MELLITUS TIPO II

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ABSTRACT

Objective: To evaluate the influence of the complications of Diabetes Mellitus on the life expectancy of elderly people. **Method:** Cross-sectional study, carried out at the Endocrinology Outpatient Clinic of a Public Hospital in Recife-Pernambuco. **Results:** Considering the Herth life expectancy scale, the overall average was 39.154 points and the median, 40 points. The relationship between complications of Diabetes Mellitus and life expectancy in the elderly was not considered direct, since the high percentages of complications from diabetes do not reflect in the reduction of life expectancy in this population. **Conclusion:** This study serves as a guide for future research on the subject, in the sense of deepening understandings of life expectancy when related to religion and/or spirituality, as well as working with a broader and more diverse population with a focus on diabetes and its impacts on the individual, family and society.

Descriptors: Aged; Life Expectancy; Diabetes Complications; Diabetes Mellitus Type 2; Nursing

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RESUMO

Objetivo: Avaliar a influência das complicações do Diabetes Mellitus na esperança de vida de pessoas idosas. **Método**: Estudo transversal, realizado no Ambulatório de Endocrinologia num Hospital Público de Recife-Pernambuco. **Resultados:** Considerando a escala de esperança de vida de Herth, a média geral foi 39,154 pontos e a mediana, 40 pontos. A relação entre complicações da Diabetes Mellitus e esperança de vida em pessoas idosas não foi considerada direta, visto que altos percentuais de complicações da diabetes não refletem na diminuição da esperança de vida desta população. **Conclusão:** Este estudo serve como norteador de futuras pesquisas sobre a temática, no sentido de aprofundar compreensões da esperança de vida quando relacionada à religião e/ou espiritualidade, bem como trabalhar uma população mais ampla e diversificada com foco na diabetes e seus impactos para o indivíduo, família e à sociedade.

Descritores: Pessoa Idosa; Esperança de Vida; Complicações da Diabetes; Diabetes do Tipo 2; Enfermagem

RESUMEN

Objetivo: Evaluar la influencia de las complicaciones de la Diabetes Mellitus en la esperanza de vida de los adultos mayores. **Método:** Estudio transversal, realizado en el Ambulatorio de Endocrinología de un Hospital Público de Recife-Pernambuco. **Resultados:** Considerando la escala de esperanza de vida de Herth, el promedio general fue 39.154 puntos y la mediana 40 puntos. Los altos porcentajes de complicaciones de la diabetes no se reflejan en la reducción de la esperanza de vida en esta población. **Conclusión:** Este estudio sirve como guía para futuras investigaciones sobre el tema, en el sentido de profundizar la comprensión de la esperanza de vida cuando se relaciona con la religión y/o la espiritualidad, así como trabajar con una población más amplia y diversa con un enfoque en diabetes y sus impactos en el individuo, la familia y la sociedad.

Descriptores: Ancianos; Esperanza de Vida; Complicaciones de la Diabetes; Diabetes Mellitus Tipo 2; Enfermería

INTRODUCTION

Diabetes Mellitus (DM) is a serious global health problem. In the elderly Brazilian population, its prevalence is 16.1%, with a forecast that the total number of people with diabetes will increase to 643 million in 2030 and to 784 million in 2045.[1]

The number of cases of diabetes has increased exponentially in recent years. Diabetes causes short, medium and long-term complications, including chronic complications or those that develop over a long period of time, which can occur in people with diabetes (especially the elderly) at the time of diagnosis.[2]

Elderly people, as they undergo changes resulting from the aging process, may be more vulnerable to DM. These changes can be psychological, morphological and biochemical in nature, which lead to a loss of self-care capacity, leaving them more prone to illness, especially chronic diseases.[3]

With senescence, issues such as social devaluation, isolation, losses, serious illnesses and economic factors can generate

crises that interfere with the health and self-esteem of the elderly person.[4]

Complications of DM pose a major threat to people with diabetes and have a poor prognosis, such as increased incidence and prevalence, which indicates that it is a serious health problem today. Understanding this pathology makes it possible to carry out the necessary prevention, in addition to early diagnosis and appropriate treatment, which improves health conditions related to this disease.[5]

With the increase in life expectancy, the importance of aging with health, dignity and autonomy is becoming clear, in order to promote quality of life and preserve the functional capacity of the elderly population. The health/disease binomial is perceived positively in this population, which contributes to the fact that, in old age, situations of crisis, suffering, discomfort and hopelessness can be overcome by good self-esteem and the willpower to live a life with quality of life.[6]

In this sense, investigating life expectancy in elderly people is also necessary, as it is understood as a feeling that moves human beings to believe in positive results. Therefore, it is necessary that elderly people diagnosed with DM2 who present this feeling are able to face their disease process with more motivation and self-care.

People with diabetes in Brazil live, for the most part, with chronic diseases, which can affect their future prospects.[7] The level of hope is associated with a higher level of satisfaction with life, or psychological well-being, self-esteem, perceived ability to solve problems, perception of control and positive expectations of achievement. Consequently, to experience healthy senescence, a satisfactory level of life expectancy is necessary.

The presence of multiple chronic diseases negatively affects several aspects of the lives of elderly people.[8] For this reason, investigating life expectancy in elderly people is necessary as it is understood as a feeling that moves human beings to believe in positive results.

In this context, the present study aims to evaluate the influence of type 2 DM complications on the life expectancy of elderly people.

METHOD

Cross-sectional, analytical study, with a quantitative approach, carried out at the Endocrinology Outpatient Clinic, located in a Public Hospital in the city of Recife-Pernambuco.

The study population consisted of elderly people aged 60 years or older, with a

diagnosis of type 2 Diabetes Mellitus recorded in the service's health records.

Individuals with a diagnosis of Type 2 Diabetes Mellitus stated in the health records of the Endocrinology Outpatient Clinic were included.from a public hospital in the city of Recife-Pernambuco with a diagnosis time of more than one year. Patients with cognitive disorders assessed by means of 3 questions contained in the Elderly Person's Health Handbook were excluded. Question number 1 of the Elderly Person's Health Handbook refers to the presence of forgetfulness observed by people other than the elderly person. The second question asks about the progression of memory loss and the third question aims to indicate the presence of impairment in daily activities due to forgetfulness. Individuals who answered yes to question no. 3 were excluded from the study.

To determine the sample size, the sample calculation equation for the study of proportion in a finite population was used, totaling 98 elderly people with diabetes.The sample calculation equation for the study of proportion in a finite population to determine the sample size was given by:

$$n = \frac{z^2 \cdot p \cdot q \cdot N}{d^2 \cdot (N-1) + z^2 \cdot p \cdot q}$$

In which,

z = quantile of the standard normal (1.96, when considering a 95% confidence coefficient);

p = prevalence with low level of life expectancy (p = 0.5);

q = expected prevalence of elderly diabetics with high life expectancy (p = 1 - p = 1 - 0.5 = 0.5);

d = sampling error (d = 0.05);

N = Expected number of elderly diabetics treated at the service between January and March 2022 (N = 87).

Regarding sociodemographic variables, the following were considered: sex (male or female); age (number of years completed); housing arrangement (lives alone, only with spouse, lives with spouse and family members or others); education (number of years completed with approval); monthly income (minimum wages in reais); color (white, black, brown or brown-skinned, yellow, indigenous or others).

Regarding clinical conditions, the following were investigated: total time of diagnosis of diabetes (in years); presence of diabetes complications (yes or no) and types of diabetes complications: cardiovascular diseases, such as heart attack, stroke and peripheral vasculopathy; kidney diseases, ophthalmological diseases (vision problems and peripheral retinopathy), neurological diseases (numbness, loss of sensitivity in the feet and hands); diabetic foot and other complications. In this study, "other complications" was the term referring to other diseases that were related to those that did not represent a relationship with cardiovascular, kidney, ophthalmological, neurological diseases or diabetic foot.

Life expectancy was assessed using the Herth Hope Scale, an instrument adapted and validated for the Portuguese language[9] for individuals with chronic diseases. The instrument consists of 12 items written in an affirmative manner, easy to understand and quick to complete (10 minutes), and graded on a 4-point Likert scale, ranging from completely agree to completely disagree, where 1 indicates completely disagree and 4 indicates completely agree. There are two items, statement number 3 and statement number 6, that have inverted scores. The total score ranges from 12 to 48, with the higher the score, the higher the level of hope.

Data collection was carried out by the research team, previously trained by the main researcher on how to complete the questionnaire and conduct the interviews with patients. The activities were carried out at the Endocrinology outpatient clinic of the study institution, at a minimum distance of 1.5 meters between participants, in a private room. Data collection only began after the study participants had signed the informed consent form.

For data analysis, a database was created in a Microsoft Excel spreadsheet and exported to SPSS software, version 22.0, where the analysis was performed. To characterize the socioeconomic and clinical profile, the percentage frequencies were calculated and frequency tables were constructed. The confidence interval for the percentages found in the categories of the variables evaluated was calculated. For the complications evaluated in the patients, the prevalence was calculated.

In the analysis of the Herth Life Expectancy Scale, the prevalence of agreement and disagreement of elderly

individuals with the statements of the items evaluated was calculated. Furthermore, the life expectancy score was calculated by summing the items of the instrument. To assess the normality of the score, the Shapiro-Wilk test was applied. Once the non-normality of the score was indicated, the comparison of the distribution of the life expectancy scale between the factors of the socioeconomic and clinical profile of the patients evaluated was made using the Mann-Whitney test and the Kruskal-Wallis test, depending on the number of categories of the correlated variable. All conclusions were drawn considering a significance level of 5%.

To categorize the Life Expectancy Scale, the assertions were grouped into “I disagree” together with “I completely disagree” and “I agree” with “I completely agree”.

This study was submitted to the Ethics Committee of the Federal University of Pernambuco and approved under opinion number: 5,271,891, considering ethical precepts and respect for human rights.

RESULTS

It was observed that the majority of elderly people are female (71.4%), aged between 60 and 69 years old 65 (66.3%), live with their spouse and family 35 (35.7%), have up to 8 years of study (70.4%) with an average of 5.81 years of study, have a monthly income of 1 to 2 minimum wages 76 (77.6%), are brown or dark-skinned 57 (58.2%).

It can be seen that the majority of elderly people have diabetes and hypertension (86.7%), have complications of diabetes (60.2%), and the largest proportion has only one complication (72.9%). Table 2 shows the distribution of the clinical profile of the elderly people evaluated.

Table 1. Clinical profile of complications in elderly people with diabetes treated at an Outpatient Unit/Specialty Outpatient Clinic. Recife-PE, Brazil, 2022.

Complications	n	%	95%CI
Clinical situation			
Just diabetes	13	13.3	7.5 – 20.9
Diabetes and hypertension	85	86.7	79.1 – 92.5
Have complications from diabetes			
Yes	59	60.2	50.3 – 69.5
No	39	39.8	30.5 – 49.7
Number of complications*			
A complication	43	72.9	60.7 – 83.1

Two complications	12	20.3	11.5 – 31.7
More than two complications	4	6.8	2.2 – 15.1

*The following complications were considered: Cardiovascular (Heart attack, Stroke, Peripheral vascular diseases), Renal (Renal failure), Ophthalmological (Vision and peripheral retinopathy), Neurological (Swelling, loss of sensitivity in the feet and hands), Diabetic foot (Wound with difficult healing) and other diseases. Source: the authors, 2022).

It was found that the elderly presented, significantly, 33 (55.9%) ophthalmological complications. Complications related to the cardiovascular and renal systems were also observed in our sample, as can be seen in Table 3.

Table 2. Distribution of chronic complications of elderly people with diabetes treated at an Outpatient Unit/Specialty Outpatient Clinic. Recife-PE, Brazil, 2022.

Chronic complications	**Response**	
Clinical situation	**Yes**	**No**
Cardiovascular	19 (32.2%)	40 (67.8%)
Renal	11 (18.6%)	48 (81.4%)
Ophthalmological	33 (55.9%)	26 (44.1%)
Neurological	03 (5.1%)	56 (94.9%)
Diabetic foot	07 (11.9%)	52 (88.1%)
Other diseases	07 (11.9%)	52 (88.1%)

Source: the authors (2022)

Regarding the distribution of opinions of elderly people with diabetes regarding the items of the Herth Life Expectancy Scale, the general average life expectancy of the elderly population was 39.154 points and the general median was 40 points. It was found that the items with which patients most agreed were: I have a faith that comforts me 96 (98.0%), I feel capable of giving and receiving affection/love 95 (96.9%) and I feel that my life has value and usefulness 95 (96.9%). The questions in which there was least agreement among the elderly were: I feel very lonely (36.7%) and I am afraid of the future 28 (28.6%).

Table 3 shows the analysis of the Life Expectancy score according to the clinical profile of the elderly individuals evaluated. A higher median life expectancy score was found in the group of elderly individuals with diabetes and hypertension,

who had more than two comorbidities. A higher median life expectancy score was found in the group of elderly individuals who had cardiovascular and neurological diseases, and who did not have kidney diseases, ophthalmological diseases and diabetic foot. The distribution comparison test was not significant for the factors evaluated, indicating that the level of life expectancy of patients is not significantly altered by the clinical profile.

Table 3. Analysis of the Life Expectancy score according to the clinical profile of elderly people with diabetes evaluated and assisted in an Outpatient Unit/Specialty Outpatient Clinic. Recife-PE, Brazil, 2022.

Factor evaluated	Median	Interquartile range
Have complications from diabetes		
Yes	40.00	9.00
No	40.00	8.00
Number of complications		
A complication	40.00	8.00
Two complications	37.00	13.50
More than two complications	41.00	12.25
Cardiovascular		
Yes	40.00	9.00
No	39.50	9.00
Renal		
Yes	35.00	11:00
No	40.00	8.75
Ophthalmological		
Yes	39.00	10.00
No	40.00	8.25
Neurological		

Yes	40.00	-
No	39.50	9.75
Diabetic foot		
Yes	37.00	16.00
No	40.00	8.75
Other diseases		
Yes	41.00	8.00
No	39.50	9.00

Source: the authors (2022)

DISCUSSION

Regarding the characterization of the population under study, it is clear that most elderly people live in homes with their families and have an income. When related to socioeconomic conditions, it is clear that most maintain an adequate standard of living to be able to live comfortably, since having a chronic disease requires spending on medication, food and other demands. On the other hand, it is clear that in Brazil, low-income people do not have housing options and live alone during their old age. In addition, individuals who live alone get sick easily, in addition to reporting difficulties in dealing with activities of daily living.[10]

Therefore, it is important to reflect that elderly people with DM2 need assistance to overcome difficulties and family support is so important that it can change the way these elderly people understand and deal with DM2. In line with this, another study emphasizes that the family/caregiver relationship is considered to be of great importance in encouraging the patient in this context of health and disease.[11]

The level of hope is notably associated with a higher level of satisfaction with life, or psychological well-being, self-esteem, perceived ability to solve problems, perception of control and positive expectations of achievement. As a consequence of these factors, preserving the feeling of hope with increases in quality of life proves to be powerful for experiencing a healthy old age.[12]

In our study, the elderly maintained a good life expectancy, including higher rates among those with more complications. This

may occur because life expectancy is an element that transcends simple logic and refers to the optimism that the elderly person carries within themselves. In many studies, quality of life has already shown higher scores among sick people than among non-sick people.

In a longitudinal study[2] conducted with baseline and follow-up data from the Fibra Campinas-São Paulo Study with elderly people over 65 years of age, it was found that diabetes causes short, medium and long-term disorders, including chronic complications that can occur in people with diabetes (especially the elderly) at the time of diagnosis. In this sense, early detection and treatment are essential to prevent disabilities and death.

Following this paradigm, DM, when poorly controlled or without prior treatment, may be associated with the development of complications: damage, dysfunction or failure of some target organs such as the eyes, nerves, kidneys, heart and blood vessels. In some circumstances, changes may be found before the occurrence of hyperglycemia, highlighting the great diversity of this metabolic disorder.[13]

Regarding the ophthalmological complications of DM, one of the reasons why this complication is more prominent in the elderly population in this study is due to the possible lack of glycemic control that leads to the occurrence of diabetic retinopathy. Because it is a disease with a slow onset, symptoms may take a while to be noticed (the initial phase is asymptomatic). Therefore, by the time the patient can be evaluated and have a rapid early diagnosis, their vision will already be significantly affected.[14]

Patients with diabetic retinopathy need to be monitored in primary care, that is, in a Basic Health Unit (UBS) where they will receive clinical adjustments, guidance on changing habits through education and health, and referrals to a specialist who, in addition to the need for clinical control, needs to undergo a more specific ophthalmological procedure or even surgical intervention to improve the health of their eyes. The great challenge is that the difficulty in accessing and the delay in effective treatment can bring risks or worsen the ophthalmological condition already present, causing personal harm and even irreversible damage. Therefore, it is important for the elderly person to have at their disposal a support network, effective clinical monitoring, and motivation to continue being the protagonist of their own life.

When it comes to life expectancy, elderly people have positive margins of a good vision of the future, of knowing where they want to go, of demonstrating determination with what they are tasked with doing and the ability to plan and carry

out tasks and commitments with euphoria and always seeking faith as the essential element.

Elderly people have a hope that has a beneficial effect on them, and the health/disease binomial is quite positive, demonstrating its reflection in old age, positively impacting situations of crisis, suffering, discomfort and hopelessness. These unpleasant moments have been shown to be overcome by good self-esteem and willpower to live life comfortably and with quality of life.[15]

The predominance of elderly people who stated that they have a faith that comforts them, whether this faith is religious or spiritual, increases life expectancy and both terms emerge as key factors in the aging process for coping with the disease and its concomitant factors. Results of recent studies indicate that religious beliefs have been impacting the spiritual prism and enabling an increase in hope; motivation and acceptance of the disease, conceiving a much higher quality of life; unquestionably resulting in motivation; positive attitudes and serving as strategies for anguish, anxiety and depression, including for those individuals with diabetes.[16]

Regarding the vision of the future, the findings indicate that there was low agreement for the item “I am afraid of the future”. This line of reasoning focuses on the idea that the elderly population, in general, does not see any perspective in their lives and does not understand ways to be active and productive in society, giving them feelings of less hope regarding plans for the future. In general, society faces the final phase of the human life cycle trying not to think too much about it.

Therefore, it is necessary for nursing professionals to provide guidance in the health practice environment and encourage the autonomy of elderly people so that they can be able to assume important roles in their lives, such as better decision-making when compared to younger people, greater health balance, reduced stress levels, improved building of good relationships, combating loneliness and having a sense of belonging in the social environment.[17,18,19]

CONCLUSION

The relationship between complications of type II Diabetes Mellitus and life expectancy in elderly people was not considered directly proportional and/or direct, since high percentages of diabetes complications do not necessarily reflect a decrease in life expectancy for this population.

A limitation of this study was the fact that the population was not asked about their religiosity, a factor that is important for understanding life expectancy.

This work has social relevance, since it directs the focus on a complex scenario of

complications of a progressive metabolic disease towards a topic that has yet to be explored in depth in the academic world, but which is directly related to the well-being, lifestyle and resilience of elderly people with Diabetes Mellitus.

This study serves as a guide for future research on the subject, with the aim of deepening the understanding of life expectancy when related to religion and/or spirituality, as well as working with a broader and more diverse population focusing on DM and its impacts on the individual with diabetes, the family and society.

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LETTER OF CONSENT

CARTA DE ANUÊNCIA

UNIVERSIDADE FEDERAL DE PERNAMBUCO
CARTA DE ANUÊNCIA

Declaramos para os devidos fins, que aceitaremos a pesquisadora Yasmin Cunha Alves, a desenvolver o projeto de pesquisa "ESPERANÇA DE VIDA DE IDOSOS COM DIABETES NA PANDEMIA DA COVID-19", que está sob a orientação da Profa. Anna Karla de Oliveira Tito Borba, cujo objetivo é avaliar a esperança de vida de idosos com diabetes durante a pandemia da COVID-19, no Ambulatório de Endocrinologia do Hospital das Clínicas da Universidade Federal de Pernambuco (HC/UFPE).

Esta autorização está condicionada ao cumprimento dos pesquisadores aos requisitos das Resoluções do Conselho Nacional de Saúde e suas complementares, comprometendo-se utilizar os dados pessoais dos participantes da pesquisa, exclusivamente para os fins científicos, mantendo o sigilo e garantindo a não utilização das informações em prejuízo das pessoas e/ou das comunidades.

Antes de iniciar a coleta de dados os pesquisadores deverão apresentar a esta Instituição o Parecer Consubstanciado devidamente aprovado, emitido por Comitê de Ética em Pesquisa Envolvendo Seres Humanos, credenciado ao Sistema CEP/CONEP.

Local, em 08 / 11 /2022.

Nome/assinatura e **carimbo** do responsável onde a pesquisa será realizada

ANNEX A – Data Usage Statement
FEDERAL UNIVERSITY OF PERNAMBUCO CENTER OF HEALTH SCIENCES
DEPARTMENT OF NURSING

AUTHORIZATION FOR USE OF RESEARCH FILES/DATA

We declare, for all due purposes, that we will grant researchers Thialy Maria Silva da Cunha e Souza and Yasmin Cunha Alves access to the database files related to the research: "Life Expectancy of Elderly People with Diabetes in the COVID-19 Pandemic" - Propesq Notice No. 03/2021, approved by the Research Ethics Committee of the Health Sciences Center of the Federal University of Pernambuco, under CAEE 54247721.3.0000.5208 to be used in the research: Life Expectancy in Elderly People and its Relationship with Complications of Type II Diabetes Mellitus, which is under the guidance of Prof. Dr. Queliane Gomes da Silva Carvalho and co-supervised by Prof. Dr. Anna Karla de Oliveira Tito Borba.

This authorization is subject to the researcher's compliance with the requirements of the Resolutions of the National Health Council and their complementary resolutions, and the researcher undertakes to use the personal data of research participants exclusively for scientific purposes, maintaining confidentiality and ensuring that the information is not used to the detriment of individuals and/or communities.

Before starting data collection, the researcher must present the duly approved Consolidated Opinion, issued by the Ethics Committee for Research Involving Human Beings, accredited to the CEP/CONEP System.

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ANNA KARLA DE OLIVEIRA TITO BORBA
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Name/signature and stamp of the person responsible for the Institution or person delegated by him/her