REME • Rev Min Enferm. 2025;29:e-1574
DOI: 10.35699/2316-9389.2025.47819

RESEARCH

DEPRESSIVE SYMPTOMS AND SELF-CARE DIMENSIONS IN OLDER ADULTS WITH TYPE 2 DIABETES: A CROSS-SECTIONAL STUDY

SINTOMAS DEPRESSIVOS E DIMENSÕES DO AUTOCUIDADO EM IDOSOS COM DIABETES TIPO 2: ESTUDO TRANSVERSAL

SÍNTOMAS DEPRESIVOS Y DIMENSIONES DEL AUTOCUIDADO EM ANCIANOS CON DIABETES TIPO 2: ESTUDIO TRANSVERSAL

Maria Cristina Lins Oliveira Frazão[1]
Lia Raquel de Carvalho Viana[1]
Gerlania Rodrigues Salviano Ferreira[1]
Cleane Rosa Ribeiro da Silva[1]
Erica Maria Belmiro dos Santos[1]
Ana Luísa Fernandes Vieira de Melo[1]
Cecília Alexandrina de Farias Pontes[1]
Kátia Neyla de Freitas Macedo Costa[1]

[1]Universidade Federal da Paraíba – UFPB, Escola Técnica de Saúde – ETS, João Pessoa – PB, Brazil.

Corresponding author: Maria Cristina Lins Oliveira Frazão

E-mail: cristinalins@hotmail.com

Authors' Contributions:

Conceptualization: Gerlania R. S. Ferreira; ***Data Collection***: Cecília A. F. Pontes; Ana L. F. V. Melo; Erica M. Belmiro; ***Funding Acquisition***: Maria C. L. O. Frazão; ***Methodology***: Maria C. L. O. Frazão; ***Project Management***: Maria C. L. O. Frazão; ***Resources Management***: Maria C. L. O. Frazão; ***Statistical analysis***: Cleane R. Silva; ***Supervision***: Katia N. F. M. Costa; ***Writing - Original Draft Preparation***: Maria C. L. O. Frazão; ***Writing ¨C Review and Editing***: Lia R. C. Viana.

Funding: Coordination for the Improvement of Higher Level Personnel (Coordenação de Aperfeiçoamento de Pessoal de Nível Superior, CAPES) - Brazil - Funding Code 001.

Submitted: 08/23/2023

Approved on: 02/27/2025

Editors in charge:
Alexandra Dias Moreira
Luciana Regina Ferreira da Mata

ABSTRACT

Objective: to correlate depressive symptoms with self-care among older adults with type 2 diabetes. **Methods**: this is a cross-sectional, quantitative study grounded in the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guideline. It was conducted in Family Health Units with a sample of 144 older adults diagnosed with type 2 diabetes. To obtain the data, a semi-structured instrument was used, encompassing aspects related to the sociodemographic profile of the individuals, as well as the application of the 15-item Geriatric Depression Scale, in addition to the use of the Diabetes Self-Care Questionnaire. **Results**: it was observed that 24.3% of participants exhibited symptoms indicative of depression, while a higher adherence to self-care practices related to medication management was reported. Regarding the relationship between the scales, a negative and inversely proportional correlation emerged between depressive symptoms and both physical activity (p = 0.010) and foot care (p = 0.006). In the regression analysis, in the final model, the variable “depressive symptoms” remained significantly and negatively associated with the self-care dimensions “Physical activity” (p = 0.010) and “Care with the feet” (p = 0.006). **Conclusions**: the increase in depressive symptoms is an indicator of a lower level of self-care in physical activity and Care with the feet.

Keywords: Diabetes Mellitus, Type 2; Aged; Depression; Self Care; Health of the Elderly; Cross-section Studies.

RESUMO

Objetivo: *correlacionar a sintomatologia depressiva com o autocuidado de pessoas idosas com diabetes tipo 2.* ***Métodos:*** *estudo transversal de natureza quantitativa, fundamentado na diretriz Strengthening the Reporting of Observational Studies in Epidemiology (STROBE), realizado em Unidades de Saúde da Família, conduzido com uma amostra de 144 pessoas idosas diagnosticadas com diabetes tipo 2. Para a obtenção de informações, empregou-se um instrumento semiestruturado que abarcava aspectos relativos ao perfil sociodemográfico dos indivíduos, além da aplicação da Escala de Depressão Geriátrica, composta por 15 itens, bem como a utilização do Questionário de Autocuidado no que concerne ao Diabetes.* ***Resultados:*** *destacou-se que 24,3% dos participantes manifestaram sintomatologia indicativa de depressão, enquanto se verificou uma aderência mais acentuada às práticas de autocuidado concernentes à administração medicamentosa. No que tange à relação entre as escalas, emergiu uma correlação negativa e inversamente proporcional entre a sintomatologia depressiva e tanto a atividade física (p = 0,010) quanto os cuidados relacionados aos pés (p = 0,006). Na análise de regressão, no modelo final, a variável "sintomas de depressão" permaneceu demonstrando associação negativa significativa com as dimensões de autocuidado "Atividade física" (p = 0,010) e "Cuidado com os pés" (p = 0,006).* ***Conclusões:*** *o aumento dos sintomas de depressão é um fator indicativo de um menor nível de autocuidado na atividade física e no cuidado com os pés.*

Palavras-chave*: Diabetes Mellitus Tipo 2; Idoso; Depressão; Autocuidado; Saúde do Idoso; Estudos Transversais.*

RESUMEN

Objetivo: *correlacionar la sintomatología depresiva con el autocuidado de personas mayores con diabetes tipo 2.* ***Métodos:*** *estudio transversal de naturaleza cuantitativa, fundamentado en la directriz Strengthening the Reporting of Observational Studies in Epidemiology (STROBE), realizado en Unidades de Salud de la Familia, conducido con una muestra de 144 personas mayores diagnosticadas con diabetes tipo 2. Para la obtención de información, se utilizó un instrumento semiestructurado que abarcaba aspectos relativos al perfil sociodemográfico de los individuos, además de la aplicación de la Escala de Depresión Geriátrica, compuesta por 15 ítems, así como la utilización del Cuestionario de Autocuidado en lo que respecta a la Diabetes.* ***Resultados:*** *se destacó que el 24,3% de los participantes manifestaron sintomatología indicativa de depresión, mientras que se verificó una adhesión más acentuada a las prácticas de autocuidado concernientes a la administración medicamentosa. En lo que respecta a la relación entre las escalas, emergió una correlación negativa e inversamente proporcional entre la sintomatología depresiva y tanto la actividad física (p = 0,010) como los cuidados relacionados*

How to cite this article:

Frazão MCLO, Viana LRC, Ferreira GRS, Silva CRR, Santos BEM, Melo ALFV, Pontes CAF, Costa KNFM. Depressive symptoms and self-care dimensions in older adults with type 2 diabetes: a cross-sectional study. REME - Rev Min Enferm [Internet]. 2025[cited ____ ___ __];29:e-1574. Available from: https://doi.org/10.35699/2316-9389.2025.47819

con los pies (p = 0,006). En el análisis de regresión, en el modelo final, la variable "síntomas de depresión" permaneció demostrando asociación negativa significativa con las dimensiones de autocuidado "Actividad física" (p = 0,010) y "Cuidado con los pies" (p = 0,006). ***Conclusión****: las prevalencias e incidencia de la lesión por fricción fueron similares a las encontradas en la literatura, a excepción de la incidencia entre los participantes en cuidados paliativos, que se presentó más elevada.*

Palabras clave*: Diabetes Mellitus Tipo 2; Anciano; Depresión; Autocuidado; Salud del Anciano; Estudios Transversales.*

INTRODUCTION

Diabetes mellitus (DM) is a major global health issue, with an estimated 783 million people living with the disease by 2045[1]. In the elderly population, the prevalence reaches 20%, affecting approximately 1 in every 5 individuals over the age of 60[2]. Factors such as increased life expectancy, heredity, poor diet, and lack of physical activity are related to this exponential increase[3]. The chronicity of this condition has the potential to cause complications in organs such as the kidneys and heart, as well as in the visual, somatosensory, and vestibular systems, along with psychosocial damage[2-4].

The negative repercussions of DM and the lack of healthy habits necessary for its management require behavioral changes that often lead to adaptation difficulties[1], resulting in negative feelings such as anger, fear, guilt, discouragement, and sadness, which interfere with disease acceptance and favor the emergence of depressive symptoms[5].

DM is associated with an increase in depressive symptoms in older adults, with 10% to 42% of aged adults with DM affected by depression[6], which can impair the management of the health-disease process, increase the chances of hospital readmissions, and elevate the risk of morbidity and mortality[7].

Studies indicate that depressive symptoms in older adults with DM are linked to an increase in limitations regarding self-care activities[8,9]. Self-care practices involve behaviors aimed at maintaining health and well-being while managing DM, including adherence to pharmacological therapy, regular physical exercise, healthy eating, blood glucose control, foot care, and regular check-ups and exams[1].

A longitudinal study conducted in Sweden monitored older people with DM over 12 years and found that the ability for self-care decreases over time, making the process of adapting to new routines increasingly stressful. Additionally, older adults are more susceptible to other comorbidities, which can intensify complications related to this condition[10].

In this regard, it is essential that nursing assessments and interventions for the elderly with DM consider not only the complications of this disease but also the vulnerability of this population to functional and cognitive changes, which may affect mental health, hindering disease management and self-care practices[7].

Thus, investigating the relationship between depressive symptoms and self-care practices may contribute to the development of strategies that prevent emotional impacts and encourage self-management of health. Based on the above, the present study aimed to verify the relationship between depressive symptoms and self-care among older adults with DM.

METHOD

An observational cross-sectional study was conducted between June and October 2019 at Family Health Units (USF) linked to the five Health Districts in the municipality of João Pessoa, Paraíba. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guideline was used to develop the report.

Study population

The sample was defined using the proportional allocation method, considering the number of aged individuals with DM attended to in each district. The sample size was determined through a stratification process, using a simple random sampling plan within each district, resulting in the following numbers: District I = 37 people; District II = 27; District III = 38; District IV = 22; District V = 18, totaling 142 individuals. To facilitate data collection, a maximum of two patients per unit was established. An additional interview was conducted in Districts I (n = 38) and II (n = 28), totaling 144 participants. Thus, 72 Primary Health Care (PHC) services were visited to compose the sample.

Inclusion criteria were: 60 years old or older, medical diagnosis of type 2 DM, and registration as a user at the USF. Exclusion criteria included older adults unable to communicate verbally and those who lacked sufficient cognitive condition to respond to the questions. This criterion was assessed using the Mini Mental State Examination[11].

Data collection and organization

The data were acquired through individual interviews, conducted both at the USF and in the participants' households. Initially, the Health District referral

was delivered to the managers of the selected USFs, accompanied by detailed explanations about the study's inclusion criteria. After this initial contact phase, the researcher established communication with the nurses and Community Health Agents at the USFs to identify the aged adults' routines and determine the most appropriate times to meet them. "Individuals were approached directly in various settings, including the waiting rooms of the USFs, social groups, and their homes. In the case of home visits, the presence of the Community Health Agents was ensured.

To collect the variables of interest and measurement instruments related to the sociodemographic profile, a semi-structured instrument was used, which underwent prior evaluation by specialists in the field, including masters and doctors. This instrument encompasses details about the USF and includes the following variables: gender, age range, marital status, occupation/profession, schooling level, and family income.

The detection of depressive symptoms was performed using the Geriatric Depression Scale[12], which was translated and validated for the Brazilian context by Paradela, Lourenço, and Veras[12]. This scale, widely used in the investigation of depressive symptoms in the elderly population, represents a simplified version of the original scale. Its design dates back to 1986, and it was developed based on the items that showed the highest correlation with the diagnosis of depression. The Geriatric Depression Scale score ranges from 0 to 15, with the following thresholds: a score of 5 or less indicates the absence of depressive symptoms, while scores above 5 indicate the presence of depressive symptoms[12].

The self-care assessment was conducted using the Summary of Diabetes Self-Care Activities, translated, adapted, and validated for Brazilian culture[13]. The questionnaire consists of 15 items, distributed across seven distinct dimensions: general diet (with two items), specific diet (with three items), physical activity (with two items), blood glucose monitoring (with two items), care with the feet (with three items), and medication use (with three items, applied according to the prescribed medication regimen). In addition to these main dimensions, three additional items are included to assess smoking habits[13].

The Summary of Diabetes Self-Care Activities allows for the evaluation of specific behaviors over the seven days of the week. Thus, the individual scores for each item can range from 0 to 7, with higher scores indicating better self-care outcomes. It is important to note that the items within the "Specific Diet" dimension should be interpreted in reverse: 7 equals 0, 6 equals 1, 5 equals 2, 4 equals 3, 3 equals 4, 2 equals 5, 1 equals 6, and 0 equals 7[13].

Data analysis

The collected data were stored in a digital file organized in Microsoft Excel. The double data entry technique was employed to ensure accuracy in data compilation, which were then imported and processed using the Statistical Package for the Social Sciences (SPSS) for Windows, version 22.0.

The normality of the numerical data was assessed using the Kolmogorov-Smirnov test. To verify the correlation between depressive symptoms and self-care behaviors, the Spearman Correlation Coefficient was used. In all statistical analyses, the significance level was set at 5%, meaning a p-value ≤ 0.05 was considered statistically significant.

Multiple linear regression analyses were conducted, considering independent variables that presented a p-value ≤ 0.20 in the correlation analyses. These variables were added to the model individually, using the Enter method, in increasing order of effect size significance. In the final model, only variables with a p-value ≤ 0.05 were retained.

Before applying the multiple linear regression models, the following assumptions were checked and met: normality of the residuals distribution, absence of multicollinearity (measured by the Variance Inflation Factor [VIF] < 10), and no occurrence of autocorrelation in the residuals (checked by the Durbin-Watson value < 2.0).

Ethical aspects

This study was submitted to the Research Ethics Committee of the Center for Health Sciences at the Federal University of Paraíba. Approval was granted under registration CAAE No. 12938619.5.0000.5188, with the corresponding opinion No. 3.475.284. The research was conducted in accordance with the guidelines established by Resolution No. 466/2012 of the National Health Council, ensuring compliance with ethical principles throughout the study and in all interactions with participants.

All procedures adopted in the research were carefully explained to the participants, addressing aspects such as the study's rationale, objectives, potential risks and benefits, as well as the guarantee of confidentiality and secrecy regarding the information provided. These clarifications were provided at the time the participants

gave their consent, formalized through the signing of the Informed Consent Term.

RESULTS

Among the participants, a higher frequency of women (66.7%) was observed, between 60 and 69 years old (56.9%), in stable unions (54.9%), with schooling ranging from nine to 12 years (33.3%), and family income between one and three minimum wages (88.9%), with most being retired (75.0%).

It was found that 24.3% of the elderly individuals presented depressive symptoms (Table 1).

With regard to self-care practices, it was observed that certain activities are more widely performed by the aged population with DM. These include: adherence to the recommended administration of insulin injections (mean score of 6.7); taking antidiabetic medications as instructed (mean score of 6.5); and complying with the prescribed dosage of oral medication for DM (mean score of 6.5). In contrast, other activities showed lower levels of adherence, such as the consumption of sugary foods (mean score of 6.0); performing blood glucose monitoring at the recommended frequency (mean score of 2.8); and engaging in specific physical activities (mean score of 1.5) (Table 2).

Table 1 – Distribution of depressive symptoms in elderly individuals with diabetes mellitus. João Pessoa - PB, Brazil, 2019. (n = 144)

GDS-15	n	%
Without depressive symptoms	109	75.7
With depressive symptoms	35	24.3
Total	**144**	**100.0**

Source: Research data, 2019.

Table 2 – Distribution of self-care activities among older adults with diabetes mellitus (n = 144), João Pessoa - PB, Brazil, 2019.

Self-care activities	Adherence Mean (SD*)
Take insulin injections as recommended	6.7 (0.74)
Take diabetes medications as recommended	6.5 (1.39)
Taking the indicated number of diabetes pills	6.5 (1.40)
Eating sweets	6.0 (1.74)
Following a healthy diet	4.8 (2.04)
Consume five or more servings of fruits and/or vegetables	4.7 (2.24)
Examining inside shoes before putting them on	4.7 (2.95)
Examining one's feet	4.5 (2.93)
Drying the spaces between the toes after washing them	4.5 (2.97)
Following food guidance	4.1 (2.20)
Performing physical activities for at least 30 minutes	3.6 (2.72)
Evaluating blood sugar	3.4 (2.76)
Eating red meat and/or whole milk derivatives	3.3 (2.24)
Assessing blood sugar on the recommended number of times	2.8 (2.89)
Engage in specific physical activities (walking, swimming, etc.)	1.5 (2.18)

*SD: Standard Deviation. Source: Research Data, 2019.

Table 3 – Distribution of diabetes-related self-care vities regarding smoking. João Pessoa - PB, Brazil, 2019. (n = 144)

Smoking	n	%
Smoked in the past 7 days		
No	132	91.7
Yes	12	8.3
Date of last cigarette smoked		
Never smoked	75	52.1
More than two years ago	55	38.2
One to three months ago	2	1.4
Within the past month	1	0.7
Today	11	7.6
Total	**144**	**100.0**

Source: Research data, 2019.

With regard to self-care activities related to smoking, it was observed that the majority of older adults reported not having smoked in the past seven days (91.7%) or never having been smokers (52.1%). Furthermore, a significant portion indicated that their last cigarette was consumed more than two years ago (38.2%) (Table 3).

Depressive symptoms showed a negative and inversely proportional correlation with two dimensions of self-care: physical activity (p = 0.010) and foot care (p = 0.006) (Table 4).

In the regression analysis, in the final model, the variable "depressive symptoms" maintained a significant negative association with the self-care dimensions "Physical activity" (p = 0.010) and "Care with the feet" (p = 0.006). These results indicate that an increase in depressive symptoms is an indicator of a lower level of self-care in these dimensions, as shown in Table 5.

Table 4 – Correlation between depressive symptoms and self-care in individuals with diabetes mellitus. João Pessoa - PB, Brazil, 2019. (n = 144)

Self-Care	Depressive symptoms	
	r	p-value
General diet	-0.043	0.609
Specific diet	-0.123	0.142
Physical activity	-0.214	0.010
Blood glucose monitoring	-0.201	0.247
Care with the feet	-0.228	0.006
Medication use	0.062	0.788

Source: Research data, 2019.

participants showed greater adherence to pharmacological treatment[18].

It is common for patients to more readily accept the use of medications, as their efficacy is often emphasized within a historical and cultural context. However, pharmacological measures are not the only therapeutic option; adherence to complementary treatment is essential, as it reduces the risk of complications and improves quality of life[19].

Regarding the consumption of sweets, participants were found to consume them frequently, which is associated with low adherence to self-care among the population in this study. A different result was observed in

Table 5 – Linear regression of depressive symptoms and self-care dimensions. João Pessoa/PB, Brazil, 2019. João Pessoa/PB, Brazil, 2019. (n = 144)

GDS-15	Non-standardized β	Standardized β	Standard Error	IC 95%	p--value	R^2
Physical activity	-0.145	-0.214	0.056	-0.256;-0.035	0.010	0.036
Care with the feet	-0.205	-0.228	0.331	-0.350;-0.060	0.006	0.052

Source: Research data, 2019.

DISCUSSION

In the present study, depressive symptoms were identified in 24.3% of the respondents. This finding is frequently reported among older adults with DM and is often associated with the development of comorbidities and complications[14]. The burden of continuous care, the requirement to maintain healthy behaviors, and the fear related to disease progression can intensify depressive symptoms in these patients and hinder the therapeutic coping mechanisms necessary for disease control[15].

In a study conducted in Rio Grande do Norte, 62.2% of participants aged 60 years or older exhibited depressive symptoms, were taking five or more medications, and had developed up to six related comorbidities[16]. Another study, carried out in Recife with 85 participants using the Geriatric Depression Scale, found that the high prevalence of depressive symptoms was associated with elevated levels of low-density lipoprotein cholesterol (LDL-C), high-density lipoprotein cholesterol (HDL-C) and systolic blood pressure — all of which are risk factors for cardiovascular diseases in patients with DM[17].

In the population investigated, with regard to self-care practices, the activities with the highest adherence were: taking insulin injections as instructed; taking the prescribed medications for DM according to recommendations; and complying with the recommended dosage of oral hypoglycemic agents. Similar data were reported in a study conducted in São Paulo - SP, where a study conducted in the same state, in the city of João Pessoa, with 126 aged participants, where the consumption of such foods occurred at a low frequency[20]. For the treatment of DM, avoiding sugar intake is fundamental, aiming to maintain a balance between consumption and insulin production[7].

A nursing educational intervention carried out with 108 older adults with DM in a primary health care service in the state of Ceará found that health education promotes adherence to self-care, particularly regarding a healthy diet, physical activity, glycemic control, and foot care[2].

There was low adherence to the activity "checking blood sugar the number of times recommended", reinforcing findings from a study conducted in the USF of the municipality of João Pessoa, state of Paraíba, where blood glucose monitoring showed low self-care activity scores[21].

Frequent capillary blood glucose monitoring is a self-care measure capable of effectively preventing complications related to the disease[2]. However, its implementation involves financial costs, including the daily use of supplies, the specialization of the professionals involved, and the need for health education for both patients and their families[22].

The pain associated with capillary blood glucose testing, as well as the lack of knowledge about the procedure and its benefits for DM control, have led older adults with the disease to perceive this self-care activity as complex[7].

Regarding specific physical activities, adherence was low, corroborating the findings of a study conducted in São Paulo with 121 older adults, which identified a high prevalence of physical inactivity[9]. Engaging in regular physical activity contributes to reducing insulin resistance, improving glycemic levels, and decreasing overweight[7]. Limited adherence to physical exercise may be related to aging-related characteristics, such as the presence of cognitive or functional impairments. Older adults frequently report pain and/or a lack of energy. Another relevant aspect is the lack of understanding about the health benefits of regular physical activity, which could serve as motivation to endure discomfort and overcome low energy levels[20-23].

In Europe, researchers have proposed the adoption of personalized physical exercise programs–including walking, strength training, among other activities–to be carried out under the supervision of a specialized professional integrated into a multidisciplinary team within health care services. The aim is to improve the functional capacity of older adults with DM. This approach is based on the identification of physical frailty as a barrier to the consistent participation of these patients in regular physical activity. The implementation of such programs seeks to enhance not only physical health but also the overall quality of life of this population, recognizing the importance of physical activity in the management of DM and in promoting general well-being[24].

The findings related to tobacco use are consistent with evidence from other studies[2,3], as most older adults reported not having smoked in the past seven days or never having been smokers, with a significant portion indicating that their last cigarette had been consumed more than two years ago. This finding may be associated with the support provided to patients by health professionals and family members, including health education and emotional support. In the state of Paraná, 23 older adults with DM who received this type of support demonstrated a better understanding of the harmful effects of smoking on DM management and succeeded in quitting the habit[3].

The present investigation evidenced that the greater the manifestation of depressive symptoms, the lower the engagement in physical activity. A similar result was found in a cluster-randomized multicenter clinical trial conducted at 74 trial sites across seven European countries, involving 964 participants aged over 70 years[24], as well as in another study conducted in São Paulo with 121 older adults with DM who exhibited depressive symptoms[9].

These findings may be associated with the tendency of these patients to avoid social interactions and to experience reduced autonomy and comorbidities, in addition to the use of multiple medications with adverse effects, including weight gain and fatigue, which frequently result in low self-esteem and impairments in well-being. Such a context is unfavorable to the practice of physical activity[15-24].

With regard to foot care, low adherence was identified in the presence of depressive symptoms, corroborating a study conducted in Finland with 195 diabetic patients, which revealed that participants with depression showed poor adherence to self-care, particularly in relation to care with the feet[25].

This outcome may be associated with the fact that foot self-care requires discipline and commitment, as it must be performed daily. However, individuals with depressive symptoms tend to face greater difficulties in adapting to daily routines, often experiencing a loss of interest and pleasure, as well as a lack of energy–thus requiring greater stimulation and follow-up[20,21].

A study conducted with 244 older adults with DM revealed that the information provided and the understanding of explanations related to foot care influence patient behavior regarding whether or not they adopt this self-care practice[15].

Therefore, the importance of actions aimed at mitigating the impact of depressive symptoms and encouraging self-care practices is underscored, especially in activities related to physical exercise and care with the feet. Nursing care plays a leading role in this context, whether in primary health care or specialized services, during nursing consultations or the provision of daily care[2].

Nurses are able to identify depressive symptoms and the factors that may trigger them. In addition, they are capable of designing a care plan and, together with the team, developing the necessary interventions. For this, it is essential that health services provide favorable conditions, such as educational technologies-like apps and protocols-that contribute to motivating older adults with DM to adopt self-care behaviors[15].

Despite the contributions of the results produced, this study has limitations due to its cross-sectional design, which does not allow for the establishment of causal relationships. Nevertheless, the identification of the observed correlations holds significant implications for the delivery of health care to older adults with DM, particularly by nurses, who play a fundamental role in the prevention and management of complications. Therefore, the

early identification of depressive symptoms is essential to prevent potential negative impacts on self-care activities.

This study may be considered an original contribution due to the specific context in which it was conducted.

CONCLUSION

The results of this study demonstrate that depressive symptoms are negatively and inversely correlated with adherence to non-pharmacological self-care activities. An increase in depressive symptoms is associated with lower engagement in self-care practices related to physical activity and care with the feet.

These findings have significant implications for the provision of health care to older adults with diabetes, especially by nurses, who play a key role in the prevention and management of complications. Therefore, the early identification of depressive symptoms becomes essential to prevent potential negative impacts on self-care activities.

REFERENCES

1. Sociedade Brasileira de Diabetes (SBD). Diretrizes da Sociedade Brasileira de Diabetes (2019-2020) [Internet]. São Paulo: A.C. Farmaceutica; 2020 [cited 2021 Oct 14]. Available from: https://portaldeboaspraticas.iff.fiocruz.br/biblioteca/diretrizes-da-sociedade-brasileira-de-diabetes-2019-2020/
2. Marques MB, Coutinho JFV, Martins MC, Lopes MVO, Maia JC, Silva MJ. Educational intervention to promote self-care in older adults with diabetes mellitus. Rev Esc Enferm USP [Internet]. 2019 [cited 2021 Oct 14];53:e03517. Available from: https://doi.org/10.1590/S1980-220X2018026703517
3. Malta DC, Ribeiro EG, Gomes CS, Alves FTA, Stopa SR, Sardinha L MV, Schimidt MI. Indicators of the line of care for people with diabetes in Brazil: National Health Survey 2013 and 2019. Epidemiologia e Serviços de Saúde [Internet]. 2022 [cited 2021 Oct 14];31:e2021382. Available from: https://doi.org/10.1590/SS2237-9622202200011.especial
4. International Diabetes Federation (IDF). Atlas. 9th ed. Brussels: International Diabetes Federation; 2022 [cited 2023 Mar 20]. Available from: https://diabetesatlas.org
5. Li Y, Teng D, Shi X, Qin G, Qin Y, Quan H, et al. Prevalence of diabetes recorded in mainland China using 2018 diagnostic criteria from the American Diabetes Association: national cross sectional study. BMJ [Internet]. 2020 [cited 2023 Mar 20];369:m997. Available from: https://doi.org/10.1136/bmj.m997
6. Zhang Y, Lv X, Jiang W, Zhu Y, Xu W, Hu Y, et al. Effectiveness of a telephone-delivered psycho-behavioural intervention on depression in elderly with chronic heart failure: rationale and design of a randomized controlled trial. BMC Psychiatry [Internet]. 2019 [cited 2023 Mar 20];19(1):161. Available from: https://doi.org/10.1186/s12888-019-2135-2
7. Borba AKOT, Arruda IKG, Marques APO, Leal MCC, Diniz AS, Linhares FMP. Problematization educational intervention to promote healthy habits in elderly people with diabetes: randomized clinical trial. Rev Bras Enferm [Internet]. 2020[cited 2023 Mar 20];73(Suppl 3):e20190719. Available from: https://doi.org/10.1590/0034-7167-2019-0719
8. Ribeiro VSS, Magalhães LVB, Cardoso SA, Rocha KO, Teixeira RB, Lima LM. Conhecimento Geral, Atitude Psicológica e Sua Associação Com a Concentração de Hba1c em Pacientes Portadores de Diabetes Mellitus Tipo 2. Arq Catarin Med [Internet]. 2021 [cited 2023 Mar 20];49(4):02-13. Available from: http://www.acm.org.br/acm/seer/index.php/arquivos/article/view/590/458
9. Trevizani FA, Doreto DT, Lima GS, Marques S. Self-care activities, sociodemographic variables, treatment and depressive symptoms among older adults with Diabetes Mellitus. Rev Bras Enferm [Internet]. 2019 [cited 2023 Mar 20];72(Suppl 2):22-9. Available from: https://doi.org/10.1590/0034-7167-2017-0579
10. Shang C, Lin, H, Fang X, Wang Y, Jiang Z, Qu Y, Cui, X. Beneficial effects of cinnamon and its extracts in the management of cardiovascular diseases and diabetes. Food & Function [Internet]. 2021 [cited 2023 Mar 20];12(24), 12194-220. Available from: https://doi.org/10.1039/D1FO01935J
11. Folstein M, Folstein S, Mchugh P. "Mini-mental state": a practical method for grading the cognitive state of patients for the clinician. J Psychiatr Res [Internet]. 1975 [cited 2023 Mar 20];12(3):189-98. Available from: https://doi.org/10.1016/0022-3956(75)90026-6
12. Paradela EMP, Lourenço RA, Veras RP. Validation of geriatric depression scale in a general outpatient clinic. Rev Saúde Pública [Internet]. 2005[cited 2023 Mar 20];39(6):918-23. Available from: https://doi.org/10.1590/S0034-89102005000600008
13. Michels MJ, Coral MHC, Sakae TM, Damas TB, Furlanetto LM. Questionario de Atividades de Autocuidado com o Diabetes: tradução, adaptação e avaliação das propriedades psicométricas. Arq Bras Endocrinol [Internet]. 2010 [cited 2023 Mar 20];54(7):644-51. Available from: https://doi.org/10.1590/S0004-27302010000700009
14. Abrantes GGD, Souza GG, Cunha NM, Rocha HNBD, Silva AO, Vasconcelos SC. Depressive symptoms in older adults in basic health care. Rev Bras Geriatr Gerontol [Internet]. 2019 [cited 2023 Mar 20];22(4):e190023. Available from: http://dx.doi.org/10.1590/1981-22562019022.190023
15. Borba AKOT, Arruda IKG, Marques AP, Leal MCC, Diniz AS. Knowledge and attitude about diabetes self-care of older adults in primary health care. Cien Saúde Colet [Internet]. 2019 [cited 2023 Mar 20];24(1):125-36. Available from: https://doi.org/10.1590/1413-81232018241.35052016
16. Fernandes FCGM, Santos EGO, Morais JFG, Medeiros LMS, Barbosa IR. Cuidado com os pés e a prevenção da úlcera em pacientes diabéticos no Brasil. Cad Saúde Colet [Internet]. 2020 [cited 2023 Mar 20];28(2):302-10. Available from: https://doi.org/10.1590/1414-462X202028020258
17. Fittipaldi EOS, Fernandes J, Andrade AD, Santos ACO, Campos S, Catanho MTJA. Depressive symptoms are associated with high levels of serum low-density lipoprotein cholesterol in older adults with type 2 Diabetes Mellitus. Arq Bras Cardiol [Internet]. 2020 [cited 2023 Mar 20];115(3):462-7. Available from: https://www.scielo.br/j/abc/a/XTTY8n7f8VVsYSv4q6MxbnC/?lang=en&format=pdf
18. Eid LP, Leopoldino SAD, Oller GASAO, Pompeo DA, Martins MA, Gueroni LPB. Factors related to self-care activities of patients with type 2 diabetes mellitus. Esc Anna Nery [Internet]. 2018 [cited 2023 Mar 20]; 22(4):e20180046. Available from: https://doi.org/10.1590/2177-9465-EAN-2018-0046
19. Frazão MCLO, Pimenta CJL, Silva CRR, Vicente MC, Costa TF, Costa KNFM. Resilience and functional capacity of elderly people with diabetes mellitus. Rev Rene [Internet]. 2018[cited 2025 Apr 04];19:e33323. Available from: https://periodicos.ufc.br/rene/article/view/33383
20. Vicente MC, Silva CRR, Pimenta CJL, Frazão MCLO, Costa TF, Costa KNFM. Resilience and self-care of elderly people with diabetes mellitus. Rev Rene [Internet]. 2019 [cited 2023 Mar 20];20,e33947. Available from: https://periodicos.ufc.br/rene/article/view/33947/pdf_1
21. Ferreira GRS, Viana LRC, Pimenta CJL, Silva CRR, Costa TF, Oliveira JS, et al. Self-care of elderly people with diabetes mellitus

and the nurse-patient interpersonal relationship. Rev Bras Enferm [Internet]. 2022 [cited 2023 Mar 20];75(1):e20201257. Available from: https://doi.org/10.1590/0034-7167-2020-1257

22. Ajjan RA. How can we realize the clinical benefits of continuous glucose monitoring? Diabetes Technol Ther [Internet]. 2017 [cited 2023 Mar 20];19(S2):S27-S36. Available from: https://www.liebertpub.com/doi/10.1089/dia.2017.0021

23. Assunção SC, Fonseca AP, Silveira MF, Caldeira AP, Pinho L. Knowledge and attitude of patients with diabetes mellitus in Primary Health Care. Esc Anna Nery [Internet]. 2017 [cited 2023 Mar 20];21(4). Available from: https://doi.org/10.1590/2177-9465-EAN-2017-0208

24. Rodriguez L, Laosa O, Vellas B, Paolisso G, Topinkova E, Oliva MJ. Effectiveness of a multimodal intervention in functionally impaired older people with type 2 diabetes mellitus. J Cachexia Sarcopenia Muscle [Internet]. 2019 [cited 2023 Mar 20];10:721-33. Available from: https://onlinelibrary.wiley.com/doi/10.1002/jcsm.12432

25. Perkkiö Y, Jokelainen J, Auvinen J, Eskola P, Saltevo J, Keinänen-Kiukaanniemi S, et al. Glucose status and depressive symptoms: a cohort study of elderly people in northwest Finland. Scand J Prim Health Care [Internet]. 2019[cited 2023 Mar 20];37(2):242-8. Available from: https://doi.org/10.1080/02813432.2019.1608050