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ORIGINAL ARTICLE

Prevalence of and factors related to depressive symptoms in people with type 2 diabetes mellitus

Prevalência e fatores relacionados a sintomas depressivos em pessoas com Diabetes mellitus tipo 2

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ABSTRACT

The objective of the study was to identify the prevalence of and factors related to depressive symptoms in people with type 2 diabetes mellitus (T2DM). A cross-sectional study was conducted with 104 people with T2DM, using a questionnaire with sociodemographic and clinical characteristics and the Beck Depression Inventory. A descriptive and correlation analysis between depressive symptoms and the variables of interest was performed using the *Spearman* and Kruskal-Wallis tests. Among the participants, 25% (n=26) had depressive symptoms, which were more frequent among those who were elderly, had a time of diagnosis of over five years and were overweight. It was concluded that there is a need for screening and early identification of depressive symptoms in individuals with T2DM, especially in the elderly, individuals with longer diagnosis time and who are overweight. In these cases, professional interventions based on actions to promote health, quality of life and prevention of complications related to the combination of these chronic conditions are encouraged.

Descriptors: Cross-Sectional Studies; Depression; Diabetes Mellitus, Type 2.

RESUMO

O objetivo do estudo foi identificar a prevalência e os fatores relacionados a sintomas depressivos em pessoas com Diabetes mellitus tipo 2 (DM2). Estudo transversal realizado com 104 pessoas com DM2, utilizando questionário com características sociodemográficas e clínicas e o Inventário de Depressão de Beck. Realizou-se análise descritiva e de correlação entre sintomas depressivos e as variáveis de interesse, com uso dos testes *Spearman* e Kruskal-Wallis. Dentre os participantes, 25% (n=26) manifestavam sintomas depressivos, sendo estes mais frequentes entre idosos, com mais de cinco anos de diagnóstico e que estavam com sobrepeso. Conclui-se pela necessidade de rastreamento e identificação precoce de sintomas depressivos em indivíduos com DM2, em especial nos idosos, com maior tempo de diagnóstico e com alteração do estado nutricional. Nestes casos, são bem-vindas intervenções profissionais pautadas em ações de promoção da saúde, qualidade de vida e prevenção de complicações relacionadas à combinação destas condições crônicas.

Descritores: Estudos Transversais; Depressão; Diabetes Mellitus Tipo 2.

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INTRODUCTION

Type 2 diabetes mellitus (T2DM) is considered a chronic disease, in which prognosis and progression are significantly dependent on lifestyle, health behaviors and self-care actions[1]. However, although the individual has great responsibility in managing the disease, many affected people have difficulties to properly implement the treatment recommendations[2], which, in turn, negatively interferes in the control of the disease and favors the emergence of complications and/or comorbidities.

Among comorbidities, depression is frequent in patients with diabetes, either because the disease increases the risk of depression or because depressed individuals have an increased risk to develop the disease[3]. Depression started to be studied as one of the possible etiological factors of diabetes or its complications, because individuals with depression are more likely to present low adherence to lifestyle changes and worse glycemic control[4]. On the other hand, blood glucose is an important regulator of mood states. In particular, hypoglycemia or severe hyperglycemia can induce negative emotional states in individuals[4].

It should be noted that depression, by itself, is responsible for worsening morbidity and mortality in the general population, even in the absence of diabetes[5]. A meta-analysis study that included 33 studies, covering more than 2.4 million participants, showed that people with depression have a 41% higher risk of developing diabetes (without differentiation between the two main types)[6]. When the research considered only studies that addressed individuals with type 2, it was found that depression increased the risk of developing the disease by 32%[6]. In turn, a cohort study evaluating the relationship between DM and depression found that the risk of depression is 1.33 times higher in people with DM, and that, globally, a reduction of 10 to 25% in the prevalence rate of diabetes can prevent 930,000 to 2.34 million cases of depression[7].

Faced with this scenario, it is important to highlight that it is difficult to diagnose depression, due to the inaccurate and sometimes arbitrary boundary between mental health and disease. For example, individuals with DM who are not depressed, but have inadequate glycemic control, may experience fatigue, altered appetite, or reduced libido, symptoms that may be confused with the typical symptoms of depression[4]. Another difficulty is that, many times, those affected do not know that they are suffering from depression. They are more likely to complain of physical illnesses, while psychological symptoms are hidden or trivialized[8]. Thus, the use of appropriate instruments, such as Beck's Depression Inventory to identify depressive symptoms in this population, is relevant, since it aids diagnosis, especially in cases in which the overlap of symptoms of different conditions make up the whole picture[8].

Considering that DM is a growing public health problem due to poor eating habits, sedentary lifestyles and environmental stress experienced in modern society, knowing the prevalence of and aspects associated with this health condition will allow health professionals to plan actions to prevent complications and promote quality of life.

Thus, the objective of this study was to identify the prevalence of and factors related to depressive symptoms in people with type 2 diabetes mellitus.

METHODS

In this cross-sectional study, people with T2DM were treated in one of the 34 Basic Health Units of a medium-sized municipality in the Northwestern region of Paraná, which, according to the last Census, had 342,310 inhabitants.

The Basic Health Unit, selected for convenience (ease of geographic access), serves a population of approximately 2,100 individuals and, at the time of the study, had a register of 140 individuals diagnosed with diabetes. The subjects were initially approached during the Hyperdia meetings — meetings to monitor people with arterial hypertension and DM. The previously established inclusion criteria were: attending follow-up meetings, being 18 years of age or older, having a diagnosis of T2DM and presenting mental capabilities to answer the questions. The exclusion questions were: incorrect completion of the data collection instrument (blank questions or more than one marked answer) and non-attendance to any of the weekly meetings, over a period of four months, aimed at data collection.

Data were collected from October 2017 to January 2018 with individualized application of the questionnaire in the waiting room of the Basic Health Unit itself, before or after the meetings. The instrument used in data collection had two parts, the first with questions addressing sociodemographic and clinical characteristics, and the second consisting of the Beck Depression Inventory (BDI), evaluating the presence of depressive symptoms.

The sociodemographic and clinical variables of interest were: age; gender (male/female); weekly physical activity (yes/no); time, in years, of T2DM diagnosis; weight and height; and nutritional status defined according to age:

- ≥60 years: underweight (<22kg/m²), normal weight (22–27kg/m²), overweight (27kg/m²)[9];
- ≥20–≤59 years: underweight (<18.5kg/m²); normal weight (18.5–24.9kg/m²); overweight (25–29.9kg/m²); obese (>30kg/m²)[10].

The Inventory was translated and validated into Portuguese[11], consisted of 21 questions, with answers in a four-point Likert-type scale (0 to 3), and the total score ranged from zero to 63 points. In this study, the cut-off points indicated for general populations were considered, i.e., not in a population already diagnosed with a psychiatric problem:

zero to 15 indicates the absence of depression; 16 to 20 — the presence of dysphoria (mild and transient behavior changes that can occur as a reaction, for example, of disappointment) and over 20 — the presence of depressive symptoms[11]. One of the authors is authorized to use the inventory for research purposes.

The data were inserted in the IBM SPSS version 20.0 program and submitted to descriptive and inferential analysis. Spearman and Kruskal-Wallis tests were used to identify factors associated with the occurrence of depressive symptoms. For all tests a significance level of 95% was considered (α=0.05).

The study respected the national and international norms of Ethics in Research with Human Beings and was approved by the Ethics Committee of Maringa State University (Opinion nº 2,393,115). In addition, all participants expressed their consent by signing the Free and Informed Consent Form in two copies of equal content.

RESULTS

A total of 104 individuals participated in the study, because 10 were excluded due to errors in filling in the instrument, seven refused to participate and 19 did not attend the meetings in the defined period.

Participants were between 32 and 84 years of age (mean 65.6 years), and the mean time of T2DM diagnosis was seven years (minimum one and maximum 40 years). More than half of them were female, practiced some physical activity, were overweight and had no depressive symptoms (Table 1).

Individuals with more than five years of diagnosis and the elderly presented significantly higher mean scores in relation to depressive symptoms (Table 2).

Age, time of diagnosis and nutritional status showed a positive and significant correlation with the BDI score. In relation to age, the value found in the correlation (r=0.48) was moderate, indicating in this case that advancing age may moderately influence the occurrence of depressive symptoms in individuals with T2DM. On the other hand, although the correlation with the time of diagnosis and nutritional status was weak, it suggests that longer time of diagnosis and being overweight influence to a small degree the occurrence of depressive symptoms (r<0.30) (Table 3).

DISCUSSION

The presence of depressive symptoms in 25% of the individuals under study draws attention, considering the characteristics investigated (age and time of diagnosis). These results demonstrate that the presence of depressive symptoms is a reality in the lives of individuals with T2DM, especially in those who are elderly, who have a diagnosis time of more than five years and who are overweight. A meta-analysis study that included 42 studies, of which 20 were of the

Table 1. Characterization of the profile of patients with T2DM treated in a Basic Health Unit in the Northern region of Maringá. Maringá, PR, 2018.

Variable	Category	n	%
Sex	Male	44	42.3
	Female	60	57.7
Physical Activity	Yes	58	55.8
	No	46	44.2
Age	32–59 years old	26	25.0
	≥60 years	78	75.0
Nutritional status (Index Classification of Body Mass)	Underweight	3	2.9
	Normal weight	44	42.3
	Overweight	56	53.8
	Obese	1	1.0
Classification Beck's Depression Inventory	No symptoms (≤15)	59	56.7
	Dysphoria (16–20)	19	18.3
	Depression symptoms (>20)	26	25.0

Table 2. Mean scores of Beck's Depression Inventory, according to sex, physical activity, nutritional status, time of diagnosis and age of individuals with T2DM. Maringá, PR, 2018.

Variable	Group	Average Beck's Depression Inventory	p-value*
Sex	Male	49.8	0.382
	Female	54.4	
Physical Activity	Yes	50.2	0.333
	No	55.3	
Nutritional status	Normal weight	50.6	0.822
	Overweight	54.0	
	Underweight	50.50	
Time of diagnosis	<5 years	44.03	0.006
	6–10 years	63.28	
	>10 years	62.92	
Age	Adults	36.0	<0.001
	Elderly	58.0	

*Kruskal-Wallis test.

Table 3. Depression and age scores, time of T2DM diagnosis and nutritional status. Maringá, PR, 2018.

Variable	r*	p-value***
	BDI	
Age	0.489	<0.001
Diagnostic years	0.249	0.011
Nutritional status	0.249	0.011

*r: Correlation coefficient; ** Spearman's correlation.

control case type, found that the chances of depression in the group of people with diabetes (9%) was double those found in the group of people without DM (5%), with about 25% of those with depression and DM suffering from clinically significant problems[12]. In turn, a review study conducted by Brazilian researchers also pointed out that depression is a common mood disorder in people with DM, affecting approximately 20% of this population, and the probability of individuals with DM developing depressive disorder is 15 to 24% higher than those who do not have this disease[13].

The positive correlation between age and depression found in the present study corroborates the result of a research conducted with elderly participants in follow-up meetings of people with hypertension and DM and who used the mental health section of the Brazil Old Age Schedule (BOAS) questionnaire, which found that 30% of them had depressive symptoms, and that this was more frequent in females (31.7%) and those who were 80 years old or more (33.3%)[14].

Sometimes, elderly people with T2DM may perceive the disease as a negative process, which always results in loss and changes in the way of life, mainly by making the person dependent on medication and having food restrictions. These factors may interfere with treatment adherence, emotional state and quality of life[15].

In addition, the elderly population is already considered more vulnerable to depression due to other conditions inherent to the aging process, related to physiological changes and the need for re-evaluation of life, for example when experiencing grief due to family and friends losses, economic inactivity, disability/limitation in the social network, absence of family members, among others[16].

Therefore, it is important to pay special attention to promoting health and self-care in this specific population, as depression tends to compromise several areas of life, including physical, psychological and social well-being. In the case of people with DM, it is reiterated that the presence of a depressive condition can be even more harmful, as it can affect the adherence to drug treatment, proper diet and healthy lifestyle habits, which, in turn, significantly interfere with disease control[17].

Differentiated attention should be given to cases in which the time of DM diagnosis is longer than five years, because it is after this period that the emergence of acute complications — such as hyper and hypoglycemia — and chronic complications, such as cardiovascular diseases, neuropathy, nephropathy and retinopathy[17], become more common. Thus, the correlation between the time of diagnosis of T2DM and the signs and depressive symptoms identified in this study may be due to complications arising from the disease, which negatively affect quality of life[4].

In turn, the positive correlation between nutritional status and depressive symptoms is indicative of the need for these aspects to be considered in care planning, since individuals with T2DM and depression, concomitantly, may present greater difficulty in implementing changes in diet, due to low motivation[18]. A cohort study conducted with 1,201 individuals with T2DM over five years showed that the prevalence of depression was persistent throughout the period in individuals with higher BMI, which reiterates the need for early and intensive interventions in individuals with this overlap of diagnoses[19].

In this context, one of the strategies that assist in reducing weight is physical activity, although in the present study no significant association between this practice and depressive symptoms was identified, probably due to the fact that more than half of the participants reported that they practiced some kind of physical activity at least once a week. International studies[20,21] have previously highlighted the importance for the elderly to devote time to physical activity and its role in reducing the chances of depressive conditions in this population. A study conducted in Korea, for example, followed more than 6,500 elderly people for three years and found that the likelihood of depression decreased by 19% in those who practiced physical activity three times a week for at least 30 minutes, and 13% and 22% respectively, among those who participated in social and religious activities weekly[21]. That is, in addition to each of the three types of activity being individually associated with a lower risk of depression, the combination of two or three types of activity is associated with a much lower risk. These results highlight the importance of health professionals working with people with DM, particularly the elderly, not only encouraging proper adherence to drug and non-drug treatment, but also promoting and mobilizing the social network and social relationships[21].

In Brazil, the Ministry of Health establishes as a function of all health professionals, especially nurses, the performance of individual and group actions focusing on health education and prevention of complications associated with DM. In addition, it highlights the need to stimulate problem solving, making the individual become the subject of action, promoting autonomy and self-care. For this, it is important that goals are agreed upon by between the patient and healthcare provider, understanding that each individual has different barriers to changing behaviors and goals that are easy for some can be challenging for others. In this sense, professionals act through supported self-care and through dialogue, as facilitators of care actions to be adopted by individuals themselves[22].

With regard to comprehensive nursing care, the need to consider the complexity of the disease in the planning of care for individuals with chronic conditions, especially due to the

fact that it involves cultural aspects that require professionals to take a humanized approach that meets the dimensions subject's biopsychosocial disorders[23].

Finally, it should be noted that the treatment of depression in individuals with DM should aim to improve the psychological condition and clinical parameters, through actions that simultaneously envisage improving depressive symptoms and glycemic control[24]. For example, strategies aimed at implementing a healthy diet, regularizing sleep patterns, encouraging physical exercise and promoting behavioral changes should be associated with psychological interventions and psychopharmacological treatments[25].

The limitations of the study are related to the type of design adopted, as cross-sectional studies do not establish a cause and effect relationship, and the impossibility of following all participants in the completion of the instrument, resulted in the need to exclude some. Despite these limitations, the results contribute to the expansion of knowledge regarding the relationship between DM and depressive symptoms.

It should be noted that the data from this study might encourage health professionals to support and include, in the therapeutic plan for individuals with DM, complementary interventions aimed at those with characteristics more susceptible to the presence of depressive symptoms, as identified in this study. Furthermore, there is a need for more research in this area, particularly to establish the temporality between the two, so that the findings can be used to improve the health conditions of this population.

CONCLUSION

The results show that 25% of people with T2DM in this study had depressive symptoms. Factors related to these symptoms were: age over 60 years, time of diagnosis over five years and nutritional status as overweight. Among these, the nutritional status stands out because it is modifiable. Thus, the plan for the care of patients with these characteristics should provide, in addition to monitoring, support for self-care, changes in diet and physical activity, and the investigation of the presence of depressive symptoms, because when present, the guidelines are sometimes not sufficient, thus requiring the involvement of family members in the care of these patients.

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