



Original article

Emotional distress in elderly people with type 2 diabetes mellitus attending primary healthcare centres

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ABSTRACT

Aim: To analyse the emotional distress in elderly people with type 2 diabetes mellitus who attend primary healthcare centres in the city of Ribeirão Preto, state of São Paulo, Brazil.

Methods: This is a cross-sectional, descriptive, populational, home-survey study. The Brazilian version of the questionnaire called Problems Areas in Diabetes was used to assess the level of emotional distress.

Results: A total of 338 low-income people older than 60 years old participated in the study, in which 66.3% were women and 51.5% were aged between 60 and 69 years, all with low schooling level. The mean score of emotional distress was 20.2 ranging from 0 to 74. The high level of emotional distress was found to be associated with self-perception of health, age of diagnosis, number of diseases associated with diabetes, use of insulin associated or not with oral anti-diabetic drugs, self-efficacy, and renal dysfunctions ($p < 0.05$). The main problem reported by the participants was their concern with the future and likelihood of severe complications (35.2%).

Conclusion: This study was able to assess some aspects of emotional distress amongst diabetic elderly people. The evidence from this research enables the strategic planning of actions at the geriatric population attending the primary healthcare centres to ensure quality of life during ageing.

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Introduction

Diabetes mellitus (DM) is a non-communicable chronic disease (NCCD) with high prevalence in Brazil and worldwide. It is a metabolic disorder characterised by persistent hyperglycaemia in which type-2 diabetes mellitus (DM2) corresponds to about 95% of the cases. Currently, DM is considered an important and increasing problem of public health due to the proportion of individuals affected by disabilities and early mortality, including the costs involved in the treatment and control of the disease [1].

In 2017, the International Federation of Diabetes estimated that 424.9 million people aged between 20 and 79 years old have DM worldwide. Based on these figures, the number of diabetic people can reach more than 628.6 million in 2045. In Brazil, about 14.3 million people had DM in 2015, whereas it is estimated that 23.3 million people can be affected in 2040. Therefore, Brazil will rank fourth for the disease in the world [2,3].

In the city of Ribeirão Preto, state of São Paulo (SP), the prevalence of DM was estimated to be 15.02% in 2006 [4]. In addition, there was an increase in the number of deaths by DM between 2010 and 2014, with a predominance in females and in the age group above 80 years. There were also higher mortality rates were observed in males. In both genders, there was a yearly mean increase of 9% in the premature mortality rate as DM reduced the life expectancy by 10 years [5].

In the past decades, there has been an increase in the life expectancy and ageing of the population. In Brazil, a demographic transition has been occurring since the 1960s due to a fall in the rates of fertility and mortality, resulting in the ageing of the population. One can observe a higher prevalence of NCCD compromising the individual's health under certain conditions, such as geriatric syndromes which affect the ability of the elderly to manage their own life by interfering with their daily activities. Therefore, elderly people have currently become an important ethnic group requiring full care [6].

DM has high rates of morbidity and mortality, in which the main causes of death in elderly people are kidney failure, amputation of lower limbs, blindness and cardiovascular diseases. With ageing, the disease can compromise the quality of life (QoL) of the people if no adequate guidelines are provided for treatment or recognition of the importance of the disease and its complications [7].

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Elderly people with DM2 can present high levels of emotional distress as they must live with the disease, which requires adjustments in the daily routine activities regarding glycaemic monitoring, continuous use of medications, balanced food, and regular practice of physical exercises. In addition, many people are concerned with the development of diabetes-related complications [8].

In this way, it is necessary to understand how DM2 influences the life of elderly people, particularly those who attend primary health-care centres (PHC), as healthcare coordination should be performed at this point. This will contribute to a greater attention to the health of this population by allowing the elaboration of therapeutic proposals to ensure the improvement of the QoL. In this sense, the objective of the present study was to assess the emotional distress of elderly people with DM2 who use the PHC in the city of Ribeirão Preto, SP, Brazil.

Methods

The data on emotional distress from DM2 were collected from a survey on adherence to drug treatment for DM2 amongst elderly people living in a city of the state of São Paulo [9]. This is a cross-sectional, descriptive, populational, home-survey study in which the data were collected between March and October of 2018.

The city of Ribeirão Preto is in the north-east of the state of SP, with a population estimated at 682,302 inhabitants in 2017 during the study planning process [10]. The study population included non-institutionalised individuals older than 60 years diagnosed with DM2 and on chronic use of medications for treatment of the disease, besides being enrolled in the family healthcare units (FHUs) ($n = 2766$) [10].

A sample of 338 elderly individuals was obtained. This sample size was calculated based on the adherence to medication treatment, which was estimated at 50% with tolerable absolute error of 5% and confidence interval of 95%. The sampling process occurred in two stages on a cluster basis. Initially, 16 clusters (i.e. team in each FHU) were drawn from the 45 health teams. Next, the participants were drawn from each cluster according to the number of elderly people with DM2. In case of loss or refusal, another draw was made from those who had not been selected before.

The following data were collected for study: age (60–69, 70–79 and ≥ 80 years old), gender (male or female); economic level (A-B, C and D-E, according to the Brazil Criteria of Economic Classification set by the Brazilian Association of Survey Companies) [11]; schooling level (0–4 years and 5 years or more of complete education); self-reported health problems (e.g. overweight and kidney impairment); number of DM-related diseases (none, 1–2 and 3 or more); self-perception of health (very good, good, regular, poor, very poor); smoking; excessive consumption of alcohol (according to the Alcohol Use Disorders Identification Test – AUDIT C) [12]; self-efficacy; glycated haemoglobin level ($< 8\%$ and $\geq 8\%$); fasting glycaemia (< 150 mg/dL and ≥ 150 mg/dL) [1,13]; medications used to treat DM2 (oral antidiabetic drugs only, insulin only, oral antidiabetic drugs associated with insulin); self-report of side effects; and adherence to medication treatment as estimated by the Brief Medication Questionnaire [14].

The emotional distress of the diabetes on the elderly's QoL was considered the dependant variable, which was estimated by using the Problem Areas in Diabetes (PAID) scale. This instrument was translated into Brazilian Portuguese (B-PAID) and validated for assessment of the emotional distress of DM (Cronbach's $\alpha = 0.93$). The PAID scale consists of 20 items addressing the negative emotional aspects of diabetes, subdivided into four dimensions: emotional problems related to DM (12 questions), problems related to treatment (3 questions), problems related to food (3 questions) and problems related to social support (2 questions). A 5-point Likert scale was used as follows: "No problem = 0", "Small problem = 1", "Moderate problem = 2", "Almost severe problem" = 3 and "Severe

problem" = 4. The total score of 0–100 points is achieved by adding the answers (from 0 to 4) given to the 20 questions of the B-PAID and then multiplied by 1.25. A score equal to or greater than 40 points is considered as the cutting value, which is used to determine the presence of a high level of emotional distress [15].

Data collection was performed by using a structure questionnaire, which was previously tested in a pilot study. The instrument was applied during home interviews in which a tablet running the RED-Cap software was used to record data [16]. The antidiabetic medications used were self-reported by the participants. In case of doubts, medical prescriptions, package inserts and packages of all medications in use were requested.

Database was analysed by using the software R®, in which variables were described and absolute frequencies, relative frequencies, means and standard deviations were calculated. The force of association between the variables and diabetes-related emotional distress was estimated by measuring the association between respective 95% confidence interval and P -value obtained with chi-square test. In the adjusted analysis, age groups and gender were possible confounding variables. Prevalence ratio was used to determine force and meaning of the association between the variables studied. P -values lower than the level of significance (usually 0.05) showed evidence for the association between the variables and diabetes-related emotional distress.

This study project was approved by the Research Ethics Committee of the Dr. Joel Domingos Machado School Health Centre of Ribeirão Preto Medical School the University of São Paulo according to ethics protocol numbers 82,225,317.0.0000.5414 and 2.487.864. All interviews were conducted after the participants read and signed an informed consent form.

Results

The sample consisted of 338 participants. The refusal rate was 6.2% ($n = 21$) during the process of recruitment, meaning that new draws were made for replacement. As shown in Table 1, one can observe a predominance of females (66.3%), age group of 60–69 years (51.5%), self-reported white race (60.9%) and schooling of 4–11 years (53.0%). Most of the interviewees had a partner (55.6%), were retired/pensioner (65.4%), were of economic class C (51.8%), perceived their health as good/very good (61.2%) and consumed neither alcohol excessively (80.8%) nor cigarettes (82.5%).

The mean score of B-PAID for the sample was 20.2 points ($SD = 16.6$), ranging from 0 to 74. When questioned about their feelings regarding DM2, 35.2% of the elderly participants were concerned with their future and possibility of severe complications, whereas 34% had much fear about living with the disease. Table 2 shows the main issues considered to be a serious problem by the participants of the study.

The frequency of high levels of emotional distress in elderly people with DM2 was estimated to be 19%. Table 3 shows the association between emotional distress of DM2 and the following variables: age group, self-perception of health, age of diagnosis of DM2, number of diseases associated with DM2, medications used in the treatment of DM2, occurrence of side effects from the medications, self-efficacy, adhesion to treatment, and kidney problem ($P < 0.05$).

In Table 4, one can observe the force and meaning of the association between the emotional distress of DM2 and the following variables: self-perception of health, age of diagnosis of DM2, number of diseases associated with DM2, medications used, self-efficacy, and kidney problem.

Discussion

In this study, the variables that influenced the emotional distress of elderly people with DM2 attended by PHC in a Brazilian city were

Table 1

Socio-demographic and economic characteristics of the elderly participants with type-2 diabetes mellitus attending the primary healthcare centres in the city of Ribeirão Preto, state of São Paulo, Brazil. (*n* = 338).

Variable	n	%
Gender		
Females	224	66.3
Males	114	33.7
Age group (years)		
60 – 69	174	51.5
70 – 79	105	31.1
≥ 80	59	17.5
Schooling (years)		
0 – 4	235	69.5
≥ 5	103	30.5
Colour/Race (self-reported)		
White	206	60.9
Non-white	132	39.1
Marital situation		
With partner	188	55.6
Without partner	150	44.4
Occupation		
Retired/Pensioner	221	65.4
Household	74	21.9
Independent professional	30	8.9
Employee	10	3
Unemployed	3	0.8
Economic class ^a		
A	7	2.1
B	53	15.7
C	175	51.8
D/E	103	30.5
Self-perception of health		
Very good/good	207	61.2
Regular/poor/very poor	131	38.8
Excessive consumption of alcohol ^b		
No	273	80.8
Yes	65	19.2
Smoking		
No	279	82.5
Yes	59	17.5

^a 2018 Brazil Criteria of Economic Classification set by the Brazilian Association of Survey Companies [11].

^b Alcohol User Disorders Identification Test – AUDIT C [12].

Table 2

Items the most frequently quoted by participants according to the Brazilian version of the Problem Areas in Diabetes Scale [15]. From the primary healthcare centres in the city of Ribeirão Preto, state of São Paulo, Brazil. (*n* = 338).

Items	n	%
Being concerned with the future and possibility of serious complications	119	35.2
Feeling fear about living with diabetes	116	34.3
Being concerned with episodes of low blood glucose levels	101	29.9
Coping with diabetes complications	99	29.3
Having feelings of deprivation regarding food and meals	85	25.1

identified. Despite the low emotional distress score, it was found that the most serious problem reported by the participants was worrying about the future and the possibility of serious complications. Soon, it should be emphasised that the geriatric population have singularities in the management of this NCCD, which must be evaluated by the healthcare team by means of special therapeutic projects as well as collective approaches [17]. This was also observed in the study on 59 users of a PHC in the city of Bauru, SP, in which a mean score of 19 (ranging from 11 to 48 points) was obtained for the B-PAID scale [18]. Moreover, a systematic review with meta-analysis estimated the prevalence of emotional distress in 36% of the individuals with DM2, being significantly higher in samples with predominance of females [19].

Elderly individuals who perceived their health as being poor, not believing to be able to control their DM2, showed higher levels of

emotional distress. One can infer based on these findings that it is necessary to take into consideration the beliefs and perceptions of these individuals regarding the disease [20]. It is known that the treatment basis consists of stimulating the adoption of healthy habits, in addition to pharmacological treatment. Therefore, propositions for management of the disease according to pathophysiological and biopsychosocial characteristics are paramount for glycaemic control [21].

A study conducted with 68 elderly individuals who attended the PHC in the city of Cajazeiras, state of Paraíba, Brazil, for treatment of DM2 showed that the disease had a significant emotional distress on the lives of younger elderly individuals (mean age of 68.8 years) and shorter time of diagnosis (mean of 6.6 years) [22]. This is supported by the results found in the present study. It is known that the emotional distress of DM2 is significant in face of the therapeutic proposals recommended as well as the biological and social consequences [23]. On the other hand, another study with 196 individuals (mean age of 61.6 years) attending the PHC in the city of Blumenau, state of Santa Catarina, Brazil, for treatment of DM2 by four healthcare teams showed that more than one-third of the participants had severe emotional distress, notably adults long living with the disease for longer [24].

About questions related to the B-PAID scale, it was found that more than one-third of the elderly subjects were concerned with their future and the possibility of serious complications. Therefore, one should emphasise that it is important to control the factors of risk and provide adequate treatment to delay the emergence of DM2-related chronic complications in elderly individuals attending the PHC, as well as to ensure longitudinality [24]. This finding corroborates those observed in the studies conducted in the cities of Bauru and Cajazeiras [18,22].

About the number of DM2-related diseases, it was found that individuals with five or more diseases have more emotional distress compared to those diagnosed with DM2 only. It was also observed that those participants with kidney problem had more distress. The literature shows that DM2 in elderly individuals is frequently accompanied with systemic arterial hypertension, dyslipidaemia, and spinal column problems. Therefore, it is important to evaluate the occurrence of multimorbidity to know the emotional distress of several diseases on the health outcomes and QoL of the elderly [24].

In terms of pharmacotherapy, it was observed that the participants using insulin only or in association with oral antidiabetic drugs (OAD) had higher levels of emotional distress compared to those using OAD only. The incorporation of insulin in the medication treatment may cause discomfort, distress, doubts, and fear [1]. In addition, studies show an association of the use of insulin with hypoglycaemia, concerns with eating at scheduled times and difficulties with administering the medication [1,13]. This finding is corroborated by a study performed in Cariri, state of Ceará, Brazil, in which 100 individuals with DM2 attending a secondary healthcare centre were evaluated. In elderly individuals, insulin is usually used when they have uncontrolled glycaemic levels. Therefore, the healthcare teams play a crucial role in encouraging the self-care based on behavioural and psychosocial aspects inherent to the elderly, that is, autonomy and capability to take responsibility for their own care [20].

A study on translation and validation of the B-PAID scale showed that there is a positive association with the levels of glycated haemoglobin, although such a finding was not observed in the present work. This may be explained since our sample consisted of subjects older than 70 years. There are also uncertainties about the ideal blood glucose level for elderly individuals with DM2 [13]. However, considering that 53.5% of the participants in the sample reported three or more DM2-related diseases, the values used are not the most appropriate ones.

Some limitations regarding this study should be addressed. One is related to the understanding of the causality resulting from the

Table 3

Emotional distress in elderly individuals with type-2 diabetes mellitus according to socio-demographic and clinic variables. From the primary healthcare centres in the city of Ribeirão Preto, state of São Paulo, Brazil. (n = 338).

Variables	Mild emotional distress ^a		Severe emotional distress ^b		p ^c
	n (n = 274)	%	n (n = 64)	%	
Gender					
Males	99	36.1	15	23.4	0,05
Females	175	63.9	49	76.6	
Age group (years)					
60–69	130	47.4	44	68.8	<0,01
70–79	91	33.2	14	21.9	
≥80	53	19.3	6	9.4	
Colour/race					
White	171	62.4	35	54.7	0,25
Non-white	103	37.6	29	45.3	
Schooling					
(years of schooling)					
0–4	193	70.4	42	65.6	0,45
≥5	81	29.6	22	34.4	
Marital situation					
Without partner	120	43.8	30	46.9	0,67
With partner	154	56.2	34	53.1	
Economic class					
A	6	2.2	1	1.6	0,62
B	44	16.1	9	14.1	
C	137	50	38	59.4	
D/E	87	31.8	16	25	
Self-perception of health					
Very good/good	179	65.3	28	43.8	<0,01
Regular/poor/very poor	95	34.7	36	56.2	
Excessive consumption of alcohol					
No	223	81.4	50	78.1	0,59
Yes	51	18.6	14	21.9	
Smoking					
No	230	83.9	49	76.6	0,19
Yes	44	16.1	15	23.4	
Age of diagnosis of diabetes (years)					
35 to 49	46	16.8	22	34.4	<0,01
50 to 64	161	58.8	35	54.7	
65 to 79	66	24.1	6	9.4	
≥80	1	0.4	1	1.6	
Glycated haemoglobin					
<8.0%	152	77.2	28	60.9	0,03
≥8.0%	45	22.8	18	39.1	
Fasting glycaemia					
<150 mg/dL	156	74.3	30	63.8	0,15
≥150 mg/dL	54	25.7	17	36.2	
Number of diabetes-related diseases					
0	20	7.3	1	1.6	<0,01
1–2	111	40.5	20	31.2	
3–4	108	39.4	24	37.5	
≥5 diseases	35	12.8	19	29.7	
Medications					
Oral antidiabetic drugs only	210	76.6	39	60.9	0,02
Insulin only	15	5.5	8	12.5	
Oral antidiabetic drugs + insulin	49	17.9	17	26.6	
Side effects from medications					
No	232	84.7	47	73.4	0,04
Yes	42	15.3	17	26.6	
Self-efficacy					
No	30	10.9	26	40.6	<0,01
Yes	244	89.1	38	59.4	
Overweight					
No	213	77.7	42	65.6	0,05
Yes	61	22.3	22	34.4	
Adherence to treatment medication ^d					
No	123	44.9	38	59.4	0,03
Yes	151	55.1	26	40.6	
Kidney problem					
No	254	92.7	54	84.4	0,04
Yes	20	7.3	10	15.6	

^a Score less than 40 points [15].

^b Score equal to or greater than 40 points [15].

^c chi-square test.

^d Brief Medication Questionnaire [14].

Table 4

Unadjusted and adjusted prevalence ratios for emotional distress in elderly individuals with type-2 diabetes mellitus. From the primary healthcare centres in the city of Ribeirão Preto, state of São Paulo, Brazil. ($n = 338$).

Variable	Unadjusted analysis			Adjusted analysis		
	PR ^a	95%CI ^b	p^c	PR	95%CI	p
Gender						
Males	1					
Females	1.7	0.97–2.83	0.06	–	–	–
Age (years)						
60–69	1					
70–79	0.5	0.30–0.91	0.02	–	–	–
≥80	0.4	0.18–0.89	0.02	–	–	–
Self-perception of health						
Very good/good	1			1		
Regular/poor/very poor	2	1.30–3.16	<0.01	2.2	1.40–3.32	<0.01
Age of diagnosis of diabetes (years)						
35 to 49	1			1		
50 to 64	0.6	0.34–0.87	0.01	0.6	0.37–0.91	0.01
65 to 79	0.3	0.11–0.59	<0.01	0.4	0.15–0.86	0.02
≥80	1.5	0.37–6.44	0.55	2.7	0.50–14.04	0.25
Glycated haemoglobin						
<8.0%	1			1		
≥8.0%	1.8	1.09–3.08	0.02	1.7	0.97–2.80	0.05
Fasting glycaemia						
<150 mg/dL	1			1		
≥150 mg/dL	1.5	0.87–2.51	0.14	1.4	0.81–2.31	0.22
Number of diabetes-related diseases						
0	1			1		
1–2	3.2	0.45–22.64	0.24	3.8	0.55–25.45	0.17
3–4	3.8	0.54–26.74	0.17	4	0.58–27.19	0.15
≥5 diseases	7.4	1.05–51.76	0.04	7.8	1.16–54.29	0.03
Medications						
Oral antidiabetic drugs only	1			1		
Insulin only	2.2	1.18–4.16	0.01	2.6	1.39–4.69	<0.01
Oral antidiabetic drugs + insulin	1.6	0.99–2.71	0.05	1.7	1.02–2.71	0.04
Side effects to medications						
No	1			1		
Yes	1.7	1.06–2.75	0.02	1.4	0.88–2.36	0.14
Self-efficacy						
No	1			1		
Yes	0.3	0.19–0.43	<0.01	0.3	0.18–0.40	<0.01
Overweight						
No	1			1		
Yes	1.6	1.02–2.53	0.03	1.4	0.87–2.18	0.16
Adhesion to medication treatment ^d						
No	1			1		
Yes	0.6	0.39–0.97	0.03	0.7	0.43–1.05	0.08
Kidney problem						
No	1			1		
Yes	1.9	1.08–3.33	0.02	2.1	1.17–3.78	0.01

^a Prevalence ratio.

^b 95% confidence interval.

^c chi-square test.

^d Brief Medication Questionnaire [14].

model of investigation. Another limitation is the quality of the information reported by the participants, since the researchers perceived that the participants had difficulty in the understanding and clarity of the B-PAID questions. This fact may be justified by the low schooling level of the participants as 69.5% of them had up to four years of schooling.

We believe that the present study provides relevant results regarding the variables which can influence the life of elderly individuals who attend the PHC in the city Brazilian. Therefore, it is possible to early detect the emotional distress resulting from DM2 and to elaborate a strategic planning of actions aimed at the geriatric population with the disease so that they can age with quality of life.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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