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Perceived Stress and Self-care Among Diabetes Patients with Cardiovascular Diseases

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Abstract

Type 2 Diabetes Mellitus (DM2) corresponds to 90-95% of all cases of DM and has a multifactorial etiology, involving genetic inheritance and environmental factors such as: diet, physical inactivity, obesity, and advanced age. People with DM2 need specific care, continuous self-care, and control of perceived stress. This study aimed to identify the perceived stress and self-care activities of patients associated with socio-demographic, clinical, and lifestyle variables. This cross-sectional, prospective, quantitative study was conducted to understand the perceived stress and self-care of DM2 patients, admitted to a Cardiovascular Hospital in São José do Rio Preto, SP, using two questionnaires and a scale. It was found that most patients were elderly, cardiopathic, hypertensive, did not practice physical activity, did not follow a diet, among other aspects. The perceived stress level represented an average score of 26.4 points, that is, less than half of the total value, suggesting a low perception of stress in the sample. Regarding the self-care domain, it was generally found to be low, as patients did not perform self-care activities on at least six days a week. The only domains performed were specific diet on average 5.2 days a week and medication use on average 4.7 days a week. It is concluded that the present study offers information for planning the treatment of patients with DM2, obtaining the best glycemic control, suggesting educational interventions or methodologies, and promoting improved adherence to self-care activities and reducing stress that influence the health outcomes of these patients.

Keywords: Diabetes Mellitus. Stress. Self-care. Cardiology. Nursing.

INTRODUCTION

Diabetes Mellitus (DM) is a metabolic disorder characterized by persistent hyperglycemia, resulting from deficiency in insulin production or its action, or both, causing long-term complications. It causes changes in the lives of these people who need specific care for the adequate management of the disease[1]. DM is a Chronic Noncommunicable Disease (CNCD) of global importance and a public health problem as there are increasing number of cases[2].

CNCDs are responsible for a high number of premature deaths, the decreased quality of life, a high degree of limitation for work and leisure activities, and the negative impact on economic issues which result in the aggravation of social inequities and

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poverty. In Brazil, in 2007, 72% of deaths were due to CNCDs. In 2012, CNCDs were responsible for 38 million deaths worldwide, and there are estimates of 52 million by 2030, which means a considerable increase in adults diagnosed with CNCDs[2].

The main types of DM are Type 1 Diabetes Mellitus (DM1), Type 2 Diabetes Mellitus (DM2), and Gestational Diabetes Mellitus (GDM)[3]. DM2 corresponds to 90-95% of all DM cases and has a multifactorial etiology, involving both genetic inheritance and environmental factors such as eating habits, physical inactivity, obesity, and advanced age. Generally, it affects individuals from 30 years of age and, in at least 80 to 90% of cases, it is associated with overweight and other components of the metabolic syndrome[3].

Usually, the disease is silent, without symptoms for a long period, the diagnosis is made in the laboratory by routine laboratory tests or by manifestations of chronic complications. The classic symptoms of hyperglycemia are: polyuria, polydipsia, polyphagia, and unexplained weight loss. Diabetic ketoacidosis is rarely the initial manifestation of DM2[3].

Its treatment aims at the metabolic control that involves levels of glucose and lipids within the normal range, to prevent chronic complications of the disease[4]. The main consequences of DM2 are chronic complications, such as acute myocardial infarction, stroke, chronic kidney disease, amaurosis, neuropathies, vascular problems, and amputations. Therefore, it is necessary to diagnose the disease as early as possible with insulin and/or oral antidiabetics. In addition to medications, people with DM2 need changes in lifestyle, a new routine, and the implementation of care[5].

Among the chronic complications of DM2, Cardiovascular Diseases (CVD), which can lead to death, are significant. According to the International Diabetes Federation (IDF), up to 80% of patients with DM2 die from causes related to heart problems[5]; specifically, acute myocardial infarction, heart failure, arterial hypertension, arrhythmia, among others[5].

As part of their treatment, in addition to strict prescription, methodologies that encourage improved adherence to self-care in medication and non-medication treatments can contribute to obtaining blood glucose levels closer to normal6. Other factors can influence the metabolic lack of control of people with DM2, among which stress stands out, especially that perceived by the patient[6].

The diagnosis and treatment of stress in patients with DM2 are of great importance, as they avoid negative consequences such as low treatment adherence, physical inactivity, social isolation, weight gain, and a lack of interest in self-care, directly influencing the risk of complications and the prognosis of the disease[7].

Self-care means to stop being passive, it is a personal behavior that can influence their health. It does not occur in an isolated way, but rather in conjunction with environmental, social, economic, hereditary factors, and those related to health services[8]. According to the World Health Organization (WHO), self-care education is recommended as a way to prevent and treat chronic diseases, as it promotes the person's involvement in their treatment and produces greater adherence to the therapeutic strategy, reducing complications and associated disabilities arising from chronic problems[8]. The person who practices self-care gives themselves several benefits, such as improving the blood glucose rate, improving quality of life, and helping to reduce morbidity associated with the complications of DM2[9].

Perceived stress is recognized worldwide as a public health problem, as it is related to people's lifestyle. There is no consensus on the definition of perceived stress,

however it is related to coping skills[10]. It is a reaction of the organism in the face of a difficult situation, where the individual in the presence of these stressors reacts in search of adaptation, going through three phases: alertness, resistance, and exhaustion[10].

Depending on the intensity and prolongation, stress causes a weakening of the immune system in the body, causing various signs and symptoms of diseases that can manifest themselves[10]. Emotional variations alter the diabetes in these carriers, thus releasing hormones that increase glucose in the individual's body. In this way, the individual responds to stress by eating more and exercising less.

IIn the present study, we sought to verify the perceived stress and self-care of people with DM2 who developed CVD, admitted to a cardiovascular hospital. In addition to associating perceived stress and self-care with variables of interest such as: gender, age, education, time since diagnosis, Body Mass Index (BMI), Systolic Blood Pressure (SBP), Diastolic Blood Pressure (DBP), casual blood glucose, diet for DM2, and physical exercise, of people with DM2 and CVD participating in the study.

METHODOLOGY

A cross-sectional, prospective, quantitative study was developed to understand the perceived stress and self-care of people with DM2 and Cardiovascular Diseases admitted to the Hospital de Molestias Cardiovasculares (HMC) of São José do Rio Preto, SP, as well as to associate the sociodemographic, clinical, and lifestyle variables such as: sex, age, education, time of diagnosis, Body Mass Index (BMI), Systolic Blood Pressure (SBP), Diastolic Blood Pressure (DBP), casual glucose, diet for DM2, and practice of physical exercises.

The concepts that guided the design of this study were reproduced in empirically testable elements through a questionnaire built and tested specifically for the context of the present study.

The study was developed in a Cardiovascular Hospital in the city of São José do Rio Preto (SP), where interviews were conducted between May 2019 and January 2020, in which a semi-structured script was used to collect sociodemographic, clinical, and lifestyle data, among others.

Instruments

The instruments for data collection were selected in order to know the perceived stress and self-care of people with DM2 hospitalized in a cardiovascular hospital, as pertains to sociodemographic, lifestyle, clinical variables, self-care, and perceived stress. For this purpose, three instruments were used: a semi-structured questionnaire to verify the sociodemographic, lifestyle and clinical variables, a Questionnaire on Self-Care Activities with Diabetes, and a Perceived Stress Scale (PSS).

The assessment of adherence to treatment usually occurs at consultations by the clinical and laboratory assessments of these patients.

Having instruments to assess and measure this adherence is of paramount importance for application in research and to guide clinicians in their assessment. Measuring adherence to DM is difficult due to the complexity of the therapeutic regimen that involves different self-care activities. To assess adherence to treatment in studies,

it is necessary to have reliable and valid instruments.

Of the questionnaires used to assess adherence to self-care in diabetics, the Summary of Diabetes Self-Care Activities Questionnaire (SDSCA) is one of the most used instruments for research. It was developed to systematically assess adherence to self-care activities in diabetic patients. Its validity and reliability have already been evaluated and established in North American populations who speak English and Spanish, as well as Portuguese[11].

The SDSCA assesses five aspects of the DM treatment regimen, grouped into six dimensions of self-care: diet (general and specific), physical activity, medication use, blood glucose monitoring, and foot care, as well as assessing tobacco use. The dimensions represent different activities for the treatment of DM, performed independently by patients[11].

The translation and adaptation process of the questionnaire followed the procedures recommended internationally for the translation and adaptation of research instruments. The translation and adaptation were authorized by the main author of the SDSCA. Initially, the face validity of the SDSCA was assessed by an endocrinologist and two psychiatrists, to verify whether the items generally possess the desired concepts. The questionnaire was then translated by an English professor[11].

The questionnaire translated and adapted for Brazil was called "Questionário de Atividades de Autocuidado com o Diabetes" ("Diabetes Self-Care Activities Questionnaire" (QAD))[11]. The QAD has six dimensions and 15 items for evaluating self-care with diabetes: "General Diet" (GD) with two items, "Specific Diet" (SDt) with three items, "Physical Activity" (PA) with two items, "Monitoring of Glycemia" (MG) with two items, "Foot Care" (FC) with three items, and "Medication Use" (M) (used according to the medication regimen) with three items. It also has three other items for the assessment of tobacco use[11].

The QAD scale has seven dimensions and 15 items, which are characterized by days of the week when people display a certain behavior, with the score for each item varying from 0 to 7; where zero is the least desirable situation and seven is the most favorable. In the items of the specific diet dimension that is asked about the consumption of foods rich in fats and sweets, the values were inverted (if 7=0, 6=1, 5=2, 4=3, 3=4, 2=5, 1=6, 0=7 and vice versa). Data about cigarette use were classified into smokers and nonsmokers and, for the analysis of this variable, the proportion of smokers and the average number of cigarettes consumed per day were considered[11].

The scale that measures perceived stress measures the degree to which individuals perceive situations as stressful. It is called the Perceived Stress Scale (PSS) and was initially presented with 14 items (PSS 14)[12].

The initial translation from English to Portuguese was done by two independent and qualified translators who were aware of the objectives of the translation. The back-translation into English was performed by another independent bilingual translator, to compare the English translation with the original instrument[12].

The items were designed to check how unpredictable, uncontrollable, and overwhelmed people assess their lives. These three factors have been considered as central components in the stress experience12. PSS is a general scale that can be used in different age groups, from adolescents to the elderly, as it does not contain context-specific issues. There are three ways to measure stress. The first is directed to the presence of specific stressors; the second, the physical and psychological symptoms of stress; and the third intends to measure the perception of individual stress in an overall

way and independent of the stressors[12].

The scale has 14 questions with answer options ranging from zero to four (0=never; 1=almost never; 2=sometimes; 3=almost always; 4=always). The questions with a positive connotation (4, 5, 6, 7, 9, 10, and 13) have their inverted scores added in the following way: 0=4, 1=3, 2=2, 3=1, and 4=012.

The remaining questions are negative and must be added directly. The total of the scale is the sum of the scores of these 14 questions, and the scores can vary from zero to 56, with the larger numbers indicating a greater perception of stress[12].

People treating their DM2 were invited and informed about participating in the present study on their first day of hospitalization; if they agreed, they were interviewed by the researchers on the same day, after signing the Informed Consent Form (ICF).

After signing the informed consent form, the patients responded to the semi-structured instrument. The present study was submitted to and approved by the Ethics Committee (CEP) for Research on human beings under Opinion no. 2.750.289.

All data collected were analyzed using descriptive and inferential statistics, stored in the MS-Excel program, with double entry and validation. Then, the database was exported to the Statistical Package for Social Science (SPSS) program, version 21.0, through which the analyses were performed.

RESULTS

63 people were approached who had DM2 and were admitted to a Cardiovascular Hospital, for reasons of cardiovascular treatment. There were 53 patients who agreed to be part of this project, who met the following requirements: i) agreed to participate in the study and signed the Informed Consent Form; ii) was oriented in time and space, able to answer the proposed questionnaires, and iii) had DM2. 10 people who did not accept to answer the questionnaires were excluded.

53 people with DM2 participated in the study that were admitted to a Cardiovascular Hospital, in the city of São José do Rio Preto - SP, during the data collection period. Table 1 shows the absolute and relative frequencies of the sample's sociodemographic variables.

There was the prevalence of men at 30 people (55.6%), 43 retired people (81.5%), and 27 people were married (51.8%) (Table 1). As for clinical variables (Table 1), 53 people (100%) reported using oral diabetes medication daily, 36 people reported not using insulin (67%), 49 people (92.4%) reported high blood pressure, 43 (81.1%) reported cardiovascular disease, 41 (77.3%) reported not having kidney disease, 46 (88.8%) reported using antihypertensive drugs, and 43 (81.1%) reported using analgesics regularly.

Regarding lifestyle, 36 people (66.7%) reported not smoking, 44 (81.5%) denied drinking alcoholic beverages, 42 (77.8%) reported not practicing physical exercises, 20 (38.9%) reported dieting for diabetes sometimes, 49 (92.4%) reported having some religious belief, and 47 (87.0%) reported having leisure activities.

Table 2 describes the sociodemographic and clinical variables that were presented in a numerical and non-dichotomous form for better interpretation.

Table 1 – Sociodemographic, Clinical, and Lifestyle Variables of People with DM2, hospitalized at a Cardiovascular Hospital, São José do Rio Preto, SP, 2020.

Sociodemographic variables	n	%
Sex		
Male	30	55.6
Female	23	44.4
Occupation		
Active	10	18.5
Retired	43	81.5
Marital status		
Not married	11	20.4
Married	27	51.8
Divorced	0	0
Widow(er)	15	27.8
Uses ODM[1]		
Yes	53	100
No	0	0
Self-applied Insulin		
Yes	8	16
No	9	17
Does not use Insulin	36	67
Smoker		
Yes	2	5.5
No	36	66.7
Ex-smoker	15	27.8
Drinker		
Yes	9	18.5
No	44	81.5
Diet		
Yes	18	33.3
No	15	27.8
Sometimes	20	38.9
Physical exercise		
Yes	4	7.4
No	42	77,8
Sometimes	7	14.8
Recreation		
Yes	6	13
No	47	87
Religious Belief		
Yes	49	92.4
No	4	7.5
Systemic Arterial Hypertension		
Yes	49	92.4
No	4	7.5
Cardiovascular disease		
Yes	43	81.1
No	10	18.9
Kidney disease		
Yes	12	22.7
No	41	77.3
Use of Antihypertensive Drugs		
Yes	46	86.8
No	7	13.2
Use of Analgesic Drugs		
Yes	10	18.9
No	43	81.1
TOTAL	**53**	**100**

[1]Oral diabetes medication

Table 2 – Numerical Variables of People with DM2 Admitted to a Cardiovascular Hospital. São José do Rio Preto, SP, 2020.

Variables	Variation	Average	Standard deviation
BMI[1]	14.8 – 45.3	28.3	5.6
SBP[2]	85 – 170	128.5	19.9
DBP[3]	49 – 100	73.6	12.2
Weight	47 – 130	79.7	19.2
Age	33 – 93	68.6	13.2
Time(years)	0 – 50	18.3	11.3
Education Time	1 – 2	1.6	0.5
Casual Glucose	80 – 433	159.7	66.7

[1]Body Mass Index; [2] Systolic Blood Pressure; [3]Diastolic Blood Pressure

According to Table 2, the sample has an average BMI of 28.3, an average SBP of 128.5, an average DBP of 73.6, an average age of 68.6 years, average diagnosis time of 18.3 years, average education of 1.6 years, and average casual blood glucose level of 159.7. This suggests that there is a predominance of overweight, normotensive, elderly people, with a longer time of diagnosis of DM2, low education, and casual blood glucose within normal parameters.

Table 3 shows the items in the study participants' self-care questionnaire and the total score for each domain of the questionnaire:

Tabela 3 – Atividades de Autocuidado com o Diabetes de 53 Pessoas Internadas em um Hospital Cardiovascular, São José do Rio Preto, SP, 2020.

Variables of Self-Care Activities with DM	Average score	Standard deviation
1. GENERAL FOOD	3.75	2.3
1.1. How many of the past SEVEN DAYS have you followed a healthy diet?	3.92	2.50
1.2. During the past month, HOW MANY DAYS A WEEK, did you follow a health professional's dietary guidance?	3.58	2.67
2. SPECIFIC DIET	5.19	1.50
2.1. How many of the past SEVEN DAYS have you eaten five or more servings of fruits and/or vegetables?	5.28	1.29
2.2. How many of the past SEVEN DAYS have you eaten high-fat foods?	5.23	1.22
2.3. How many of the last SEVEN DAYS did you eat sweets?	5.08	1.25
3. PHYSICAL ACTIVITY	1.08	1.93
3.1. How many of the last SEVEN DAYS did you do a physical activity for at least 30 minutes?	1.15	2.07
3.2. How many of the past SEVEN DAYS have you practiced any specific physical exercise outside of home or work?	1.02	1.90
4. MONITORING GLYCEMIA	2.64	2.73
4.1. How many of the past SEVEN DAYS have you evaluated blood sugar?	2.70	2.85
4.2. How many of the past SEVEN DAYS have you evaluated blood sugar the number of times recommended by the doctor or nurse?	2.58	2.81
5. FOOT CARE	3.60	2.43
5.1. How many of the past SEVEN DAYS have you examined your feet?	3.2	2.51
5.2. How many of the past SEVEN DAYS have you examined inside your shoes before putting them on?	3.57	2.56

to be continued...

...continuation table 3

Variables of Self-Care Activities with DM	Average score	Standard deviation
5.3. How many of the last SEVEN DAYS have you dried the spaces between your toes after washing them?	3.62	2.58
6. MEDICATION	4.74	4.58
6.1. How many of the past SEVEN DAYS have you taken your diabetes medications as recommended?	5.79	2.06
6.2. How many of the past SEVEN DAYS have you taken your insulin injections as recommended?	2.62	3.05
6.3. How many of the past SEVEN DAYS have you taken the indicated number of diabetes pills?	5.79	1.97

As for self-care variables (Table 3), it appears that during seven days a week, study participants reported, on average, following a non-specific healthy diet for 3.7 days, specific diet for DM2 on average 5.2 days a week, performing physical activity (physical exercises) on average 1.1 days per week, monitoring blood glucose on average 2.6 days a week, performing foot care for an average of 3.6 days, and using medications (oral diabetes medication and/or insulin) for an average of 4.7 days a week. As for the component of the Self-Care Questionnaire that assessed people's smoking, most of them denied being a smoker, two people reported smoking.

Table 4 describes the items of the Perceived Stress Scale (PSS) and the total score of the scale:

Table 4 – Perceived stress related to DM2 of 53 people admitted to a Cardiovascular Hospital. São José do Rio Preto, SP, 2020.

DM-Related PS Variables	Average score	Standard deviation
1. Were you sad because something unexpected happened?	2.28	1.28
2. Do you feel unable to control the important things in your life?	2.23	1.22
3. Are you feeling nervous and "stressed"?	2.15	1.34
4. Do you successfully deal with life's difficult problems?	1.70	1.22
5. Do you feel that you are coping well with the changes in your life?	1.72	1.09
6. Do you trust your ability to solve personal problems?	1.55	1.11
7. Do you feel that things are happening according to your will?	1.68	1.09
8. Do you think you cannot handle everything you have to do?	2.09	1.20
9. Can you control the irritations in your life?	1.57	.951
10. Do you feel that things are under your control?	1.38	.985
11. Have you been irritated by things that are out of your control?	2.30	1.11
12. Do you realize that you are thinking about the things you should do?	2.19	1.15
13. Can you control how you spend your time?	1.36	9.22
14. Do you believe that the difficulties are accumulating to the point of believing that they are impossible to overcome?	2.21	1.15
Total Average Score	26.4	8.86

As for the perceived stress, it appears that the average total score of the sample was 26.4 points within a scale score that could vary from 0 to 56 points. And 37 people (68.5%) had an average perceived stress score above 26.4 points, suggesting that, in the sample, the perceived stress was not high.

Table 5 shows the associations between the variables of interest, self-care, and perceived stress (PE) in the sample:

Table 5 – Relationships between the Variables of Interest, the domains of self-care, and perceived stress of 53 people with DM2 admitted to a Cardiovascular Hospital, São José do Rio Preto, SP, 2020.

Variables	GD*	SDt*	PA*	MG*	FC*	M
Age	-6.22 (p=.000)*	-6.22 (p=.000)*	-6.22 (p=.000)*	-6.22 (p=.000)*	-6.22 (p=.000)*	-6.22 (p=.000)*
BMI	-6.34 (p=.000)*	-6,34 (p=.000)*	-6.34 (p=.000)*	-6.34 (p=.000)*	-6.34 (p=.000)*	-6.34 (p=.000)*
SBP	-6.34 (p=.000)*	-6.34 (p=.000)*	-6,35 (p=.000)*	-6.34 (p=.000)*	-6.34 (p=.000)*	-6.34 (p=.000)*
DBP	-6.34 (p=.000)*	-634 (p=.000)*	-6.36 (p=.000)*	-6.34 (p=.000)*	-6.34 (p=.000)*	-6.34 (p=.000)*
Casual Glycemia	-6.34 (p=.000)*	-6.34 (p=.000)*	-6.34 (p=.000)*	-6.34 (p=.000)*	-6.34 (p=.000)*	-6.34 (p=.000)*
Perceived Stress	-6.30 (p=.000)*	-6.30 (p=0.000)*	-6.27 (p=.000)*	-6.29 (p=.000)*	-6.33 (p=.000)*	-6.30 (p=.000)*

* P-value referring to the Wilcoxon test with statistical significance for p <0.05

Through the Wilcoxon test, there was a statistically significant and inversely proportional relationship between all the domains of the self-care questionnaire and the variables of interest presented as well as the perceived stress. This suggests that advanced age, high values of BMI, SBP, DBP, casual blood glucose, and perceived stress were associated with self-care activities on fewer days of the week.

DISCUSSION

It was found that the majority of the sample (55.6%) was male and aged over 60 years, these patients were hospitalized for cardiovascular treatments and had DM2. Similarity was noted in the results of other studies in which there was a prevalence of elderly people with hypertension (SAH) and DM2 of the male gender (63.3%)[13].

However, some studies also demonstrated that the majority of hospitalized patients were men, who probably did not seek this service willingly[14,15]. As for the advanced age of these patients, due to aging, there is the emergence of chronic disabling diseases that have started to gain greater evidence in the health scenario. Among them, DM2 stands out, which is one of the most common chronic diseases in the elderly[14,15].

Most participants were married (52.8%), retired (81.5%), and regularly used oral diabetes medication (100%). In one study, 50% were married, and 70% were retired, and the majority (86.7%) follow the pharmacological guidelines, while in another study the prevalence of DM mostly affected married individuals (64.9%)[13,16].

In relation to being a smoker and drinking alcohol, most reported not using them. The data indicate that, in Brazil, the number of non-smokers is growing, as well as the proportion of ex-smokers among people aged 60 or more, due to the realization of awareness campaigns and anti-smoking educational work[17]. The prevalence of elderly people who did not consume alcoholic beverages observed in this study and the time of diagnosis are consistent with the results of the present study[17].

The incidence of hypertension in DM2 patients increases with age, it is a natural predisposition due to vascular changes intrinsic to aging. However, due to the negative effects that hyperglycemia and hyperinsulinemia have on the body, a diabetic elderly person is more prone to systemic arterial hypertension than a non-

diabetic elderly person. DM2 can develop in association with other diseases such as SAH, dyslipidemia, and visceral obesity, which significantly increases cardiovascular morbidity and mortality, increasing the risk of death gradually[18]. In DM2 patients, dyslipidemia is caused by factors such as obesity, not practicing physical activities, SAH, family history, smokers, and alcoholics.

In this study, it was demonstrated that the majority of patients were undergoing treatment for SAH (90.7%) and cardiovascular disease (79.6%), were overweight, and had been diagnosed for more than 10 years with DM2. Obesity and overweight together increased by 27.5% in adults. In Brazil, this obese population grows more and more. Some surveys indicate that more than 50% of the population is overweight, that is, in the overweight and obesity range[19].

Excess weight, overweight and/or obesity is a factor that is present in most patients with DM2. In the diabetic population, in both sexes, a BMI value greater than or equal to 5.0 kg/m2 results in an increased probability of being affected by CVD[20]. Weight reduction improves glucose tolerance and lipid profile, in addition to dramatically reducing blood pressure levels and symptoms of depression associated with the disease[20].

CVDs can weaken patients and trigger disorders such as depression and anxiety. Among the mechanisms that connect psychosocial factors with CVD are inappropriate behaviors (ex. inadequate lifestyle, lack of social support, stress at work, anxiety, low adherence to treatments). For individuals with a high risk for CVD, multimodal interventions are recommended which interact with education on healthy lifestyles and medical resources, physical activity, stress control, and counseling for psychosocial risk factors. People of a low socioeconomic status, the elderly, or females may need individualized programs to meet their specific needs for information and emotional support[21].

As for physical exercise, the majority answered that they did not practice any (77.8%). They reported that since their cardiac treatment triggered tiredness with minimal efforts and respiratory discomfort, they did not do any type of exercise or walk.

Most of the patients were elderly, weak, and moved with the help of a walker and a caregiver. In one study, data related to physical activity showed a high percentage of sedentary diabetics (88%), which can be an aggravating factor in the treatment and control of the disease[21]. These data coincide with those found in a study carried out with DM2 patients, in outpatient clinics of secondary and tertiary health centers in the city of Ribeirão Preto, in which it was observed that 70.3% of diabetics did not practice physical activity[21]. The physical activity performed, throughout life, contributes significantly to the prevention of diseases and reversal of limitations[21].

Studies prove the effectiveness of physical exercises in people with heart disease. Physical exercise promotes the improvement of cardiovascular performance, beneficially altering the risks of developing heart disease. Each patient needs an individual exercise, accompanied by a trained professional who can start in the hospital and continue at home[21].

Regarding the diet, patients reported not being able to eat properly every day of the week; the result was sometimes 38.9%. This result was the same found in a survey conducted with DM2 patients, registered in a Basic Health Unit in which it was found that 55.2% of diabetics had difficulty adhering to the diet. Adequate nutrition is important for diabetes control to be achieved at desirable levels. Changes in eating habits are essential, benefiting better metabolic control and weight gain[22]. The practice of self-care at home is essential in the treatment of DM2 and in heart diseases, helping to improve the quality of life and easing their coexistence with the disease[22].

CONCLUSION

As for the objectives proposed in this study: it was identified that the average score for perceived stress in the sample did not reach half of the total points of the scale. 68.5% of participants reached an average stress score below the total sample mean, suggesting a low perception of stress in the sample.

Regarding the self-care domains, it was found that, in general, the self-care behaviors associated with DM2 in the sample were low, since none of the self-care domains were performed by the participants on at least six days of the week. The domain of self-care most performed by the study participants was in relation to "Smoking", as only two people reported smoking; followed by the "Specific Diet" domain performed on average 5.2 days a week; and the domain "Use of Medications", performed on average 4.7 days a week.

As for the associations between the variables of interest, it was found that advanced age, high values of BMI, SBP, DBP, casual blood glucose, and perceived stress were associated with self-care behaviors performed on fewer days of the week.

It is concluded that this study offers information for planning the treatment of people with DM2, in order to obtain the best glycemic control, suggesting that educational interventions or methodologies that promote improved adherence to self-care behaviors and reduced stress can influence the results in their health.

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