Research Article

Effects of health education on lifestyle and health conditions of people with diabetes mellitus and/or hypertension treated in primary care

Abstract

Introduction: Chronic Non-Communicable Diseases (NCDs) in particular Type II Diabetes Mellitus (DM) and Systemic Arterial Hypertension (SAH), are pathologies that are related to high rates of morbidity and mortality, mainly regarding their acute and chronic complications, Type II DM is characterized by an increased concentration of glucose in the bloodstream due to a deficiency in insulin secretion or action, and systemic arterial hypertension (SAH) is characterized by multifactorial clinical conditions of elevated and sustained levels of blood pressure above normal in the arteries. High drug costs, increased hospitalizations, increased numbers of doctor visits, lost productivity, and premature deaths are associated with patients with these NCDs. DM and hypertension are diseases that must be treated correctly in order to avoid complications and loss of quality of life.

Objective: To evaluate the effects of health education on the lifestyle and health conditions of people with diabetes mellitus and/or hypertension treated in primary care.

Methodology: This is a longitudinal epidemiological study, with a quantitative, exploratory nature. The population will be composed of users of Primary Health Care with diabetes and/or hypertension. The sample will consist of patients registered and monitored by the ESF health teams of a neighborhood of the city of Montes Claros - MG. As an instrument of data collection where will be used a questionnaire for socioeconomic evaluation, demographic and clinical aspects, food consumption, evaluation of physical activity level, evaluation of anthropometric measures and evaluation of self-care behavior. The students and the professor will invite health professionals to give the lectures. The research project will be submitted for review to the Ethics Committee on Research involving Human Beings of the Educational Association of Brazil - SOEBRAS, Montes Claros, where it will be subject to prior approval to conduct the study, according to Resolution 466/12.

Keywords: type II diabetes mellitus, systemic arterial hypertension, primary health care

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Introduction

Health promotion is based on the choice of individual practices of approach that is not only related to the responsibilities of the health sector, becomes necessarily by ensuring social and economic conditions that create an appropriate foundation for the adoption of healthy living habits.[1] Studies have emphasized the need for governments to adopt health measures for all, seeking the promotion and prevention of health, where strategies are developed among all sectors, in order to cover human development, sustainability, equity and improve health conditions.[2]

With regard to public health problems, especially those related to lifestyle, Chronic Non-Communicable Diseases (NCDs) such as Diabetes Mellitus (DM) and Systemic Arterial Hypertension (SAH) create the most challenging public health problems and are indicative of a high number of premature deaths.[3,4]

DM is a chronic pathology characterized by elevated blood glucose called hyperglycemia. It is characterized by insulin resistance that occurs by chronic excessive intake of foods rich in high glycemic index that stimulate the release of insulin, such as simple carbohydrates and foods rich in sugar.[5] It occurs due to the deficiency in the production of the hormone called insulin produced in the betas cells by the pancreas. The lack of insulin causes a drop in glucose metabolism, characterizing a DM picture, where hyperglycemia manifests itself permanently in the blood.[6]

The high rates of people with DM have been growing rapidly thanks to the increase in life expectancy, which characterizes the growth of the elderly population and the prevalence of people in urban areas. The contact with the ease in consuming highly processed products, pre-prepared foods, with self glycemic index, along with the increase in workload, lead to the significant increase in sedentarism and obesity, as well as the greater survival of patients with DM.[7]

DM stands out as an important cause of morbidity and mortality. International and national studies indicate that 382 million people live with DM (8.3%), possibly reaching 592 million in 2035. These studies point out that approximately 50.0% of diabetics do not know they have the disease. It is estimated that 5.1 million people aged 20-79 years died from diabetes complications in 2013. It is believed that by 2030, DM may rise from ninth to seventh leading cause of death worldwide.[8]

There are 3 types of Diabetes: Gestational DM, which is defined by low glucose tolerance, diagnosed during pregnancy at risk of extending until after birth or even being transmitted in the fetus.[9] Type I DM, also classified as insulin-dependent, responsible for the destruction of pancreatic β-cells, which leads to an absolute deficiency of insulin production.[8] and finally type II DM, designated as non-insulin-dependent DM, its characteristic is insulin resistance and/or by insufficient secretion of insulin from pancreatic β-cells.[8]

According to the Brazilian Diabetes Society,[10] most patients with DM II are overweight or obese, and ketoacidosis rarely develops

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spontaneously, occurring only when associated with other conditions such as infections. In this sense, monitoring and quantifying the current rise of DM and quantifying the number of people with diabetes in the future is very important, as it expedites planning where you can allocate resources rationally in the treatment and prevention of these comorbidities.[10,11]

Systemic arterial hypertension (SAH) is a NCD with a multifactorial clinical condition described by high and sustained blood pressure (BP) (BP $\geq$140 x 90 mmHg). It is frequently related to functional and/or structural dysfunctions of target organs (heart, brain, kidneys and blood vessels) and to metabolic alterations, with a high risk of fatal and non-fatal cardiovascular events SOCIEDADE BRASILEIRA DE CARDIOLOGIAs.[12]

In many patients with SAH, the elevation of BP is due to increased peripheral vascular resistance (PVR) while in some, the elevation of cardiac output (CO) is responsible for SAH.[13] The pathophysiological factors of SAH are linked to increased or inappropriate secretion of renin with resulting increased production of angiotensin II and aldosterone, changes in the expression of the kallikrein-kinin system, deficiency of vasodilators such as prostacyclins, nitric oxide and natriuretic peptides, abnormalities in resistance vessels, including selective lesions in the renal microvasculature.[14]

A plurality of these pathophysiological disorders can be the cause of sustained hypertension and are differentiated into: familial predisposition (genetic factors), lifestyle drugs/medications, factors implicated in the genesis of SAH, increased sympathetic nervous system activity, increased production of sodium-retaining hormones, increased production of vasoconstrictors, increased salt intake, inadequate potassium and calcium intake.[14]

According to data from the National Health Survey conducted in 2013, the prevalence of self-reported AH was 21.4% in the population. An estimate of more than 30 million people with this NCD, under treatment or recently diagnosed.[15] This pathology is recognized as an important public health problem due to the advances in the identification of risk factors, early diagnosis, use of broad drug therapy and educational actions for lifestyle changes.[16] SAH has a high potential for the development of other associated diseases such as DM, which predisposes to the development of risk factors due to metabolic changes.[17]

SAH and DM amplify the risk for complications in the body's small and large blood vessels, peripheral arterial insufficiency, inducing a person to congestive heart failure, coronary and cerebrovascular disease, heart attack, kidney disease, and eye disease.[18]

DM and SAH are responsible for 60 to 80% of cases treated by the Unified Health System (SUS). They are the main risk factors for cardiovascular diseases, being the leading causes of hospital admissions in the public health system.[19]

The Ministry of Health has established guidelines and methodologies in the management and care of people with chronic diseases, and more specifically, for diabetes and hypertension, since the control of these diseases is also the responsibility of primary care.[20] According to Stopa,[4] these comorbidities cause loss of quality of life, causing disabilities to perform activities of daily living, in addition to the economic impact for societies and health systems.

In this sense, early detection, treatment and control of SAH and DM are essential for the reduction of their related aggravations.[4]

Health promotion, dietary care, physical activity practice, and the work of prevention, diagnosis, and treatment of health problems,

especially due to the association of DM and SAH, are of great importance to reduce the numbers of these diseases, where they should be associated with other health care contents of the Unified Health System (SUS) for individuals, families, and communities. Orientations for self-care in the health of people with type II DM and the diagnosis of SAH along with its treatment are part of the work of professionals of the Family Health Strategies, which develop tactics for the control and treatment of these diseases.[17]

The purpose of health education interventions should be the principles of integrality, guidelines on food and nutrition are essential in the interdisciplinary work of these actions. Thus, it is recommended to develop a pact of integrated records on food and nutrition education, intra and intersectoral, and should be a priority in health promotion.[21] Even with the advances in science on the various risk factors for NCDs, it is necessary to reinforce the need for immediate control actions through public health policies aimed at the quality of life of the population, with approaches that will sensitize people and encouraging them to adopt healthy lifestyles from health education strategies.[22]

The educational practices in health services are done with the vision of sensitizing this neediest population, devoid of information about health care, although community participation is present in the rhetoric of many managers, health professionals and educators and advocated in the principles and guidelines are the responsibility of SUS.[23]

Goals

General objective

To evaluate the effects of health education on the lifestyle and health conditions of people with diabetes mellitus and/or hypertension treated in Primary Care.

Specific goals

To evaluate the socioeconomic, demographic, and clinical aspects of people with diabetes mellitus and/or hypertension seen in Primary Care.

To evaluate the food intake of people with diabetes mellitus and/or hypertension treated in Primary Care.

To evaluate the level of physical activity of people with diabetes mellitus and hypertension treated in Primary Care.

Anthropometric profile of people with diabetes mellitus and hypertension treated in Primary Care.

Promote health education actions for diabetics and/or hypertensive people.

Justification

Diabetes Mellitus and Hypertension are multifactorial chronic noncommunicable diseases with a high incidence and prevalence worldwide.[3] Chronic noncommunicable diseases (NCDs) are a serious public health problem for all countries in the world, being the leading cause of morbidity and mortality and responsible for about 58.5% of all deaths, and their incidence and prevalence are associated with population aging. Most people present associated risk factors such as overweight, inadequate diet, hereditary factors, in addition to other problems such as high consumption of psychotropic drugs, smoking, alcoholism, work overload, and a sedentary lifestyle.

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The importance of information passed on in a clear, correct and objective way through primary care in the form of lectures and interventions by health professionals can stimulate a significant improvement in the lifestyle of patients with NCDs, the issue of social support is based on findings that point to its role in health maintenance, disease prevention and as a facilitating agent for convalescence.[24] During the sensitization process, it is important to emphasize prevention and practices that can be inserted into their daily lives, such as improved nutrition, physical activity and anxiety control.

Thus, this study has high social importance, since encouraging the population to change habits that affect health maintenance by avoiding inappropriate eating practices, such as high consumption of sugar, salt and oil, low fluid intake, moderate consumption of alcoholic beverages and increase the population's knowledge about risk factors and diabetic and hypertensive patients about their disease, risks and complications become important to improve the quality of life of this population. The results of this study can also contribute to future research in order to elucidate the problems that still afflict the diabetic and hypertensive population, especially with regard to health education and self-care behavior.

Proposed methodology

Study type: This will be a longitudinal epidemiological study, with a quantitative, exploratory nature.

Scenario/Population/Sample

• **Scenario**

The research will be carried out in the Teams of the Family Health Strategy in a neighborhood of the city of Montes Claros - MG.

• **Population and sample**

The population will consist of diabetic and/or hypertensive patients registered and followed-up by the ESF teams of the UBS in the period from August to October 2019. For the sample, the total number of individuals enrolled in HIPERDIA will be considered, which according to data from the Municipal Health Secretariat is 250 people.

Inclusion/exclusion criteria

Inclusion criteria

i. People diagnosed with type II diabetes mellitus and/or hypertension;

ii. People assisted by the ESF's of Montes Claros - MG.

iii. Be aged ≥ 18 years.

Exclusion criteria

Patients:

i. Who, after reading the Informed Consent Form provided by the researchers, does not agree to participate in the research;

ii. Who declare themselves unwilling to continue the activities proposed by the research.

iii. Patients who do not attend all the meetings during the intervention.

iv. Patients not psychologically able to answer the questionnaire.

People diagnosed with DM II who presented at least one of

the following conditions would be excluded: active lesion or ulcer in the lower limbs, previous amputations at any level of the lower limbs, undergoing hemodialysis or amaurosis, using a wheelchair and/or stretcher, physical disability, sequelae of a stroke, difficulty understanding the instruments due to cultural factors, unable to maintain a dialogue, and concomitant participation in another educational group.

Instruments

The research project will be presented to the Municipal Health Secretariat, where the signature of the Institutional Term of Agreement (TCI) will be requested, authorizing the study to be carried out in the FHS. After the survey of patients registered in the Family Health Strategies, a moment will be organized to gather all those willing to participate, where the research project will be presented and the patient will be invited to sign the Informed Consent Form for participation in the study (Appendix B).

Data will be collected from a questionnaire that will address socioeconomic, demographic, and clinical aspects, food consumption, and the level of physical activity (Appendix A). The anthropometric profile of the patients will also be evaluated using bioimpedance scales.

Procedures

Socioeconomic and demographic evaluation and clinical aspects: The socioeconomic and demographic characteristics will be verified through a questionnaire with information about age, race (white, brown and black), education (less than or equal to 8 years and more than 8 years of formal education), family income (less than or equal to 2 minimum wages, 2 to 5 minimum wages, or more than 5 minimum wages), marital status (single, married, divorced, widowed) (APPENDIX A).

Regarding the clinical variables, data will be collected on previous history of chronic diseases in the family, whether the patient has been treated for weight loss or takes medication for DM and for SAH.

Food consumption: The questionnaire for information on food consumption will be composed of 7 food groups (cereals and legumes; oils and fats; snacks and canned food; meats and eggs; milk and dairy products; vegetables and fruits, and finally, beverages) being subdivided into different foods (APPENDIX C). The group of leafy greens and vegetables will have a space reserved for the participants to specify the foods they consume most frequently. Participants will be instructed to report the amount of food consumed in home measures (tablespoons, serving spoons, skimmers, ladles, fork, knife, handles, mugs, American cup, double cup, cup and plates) or units.[25] As well as their frequency, with possible answers regarding consumption (1 -2 times a day; 1-3 days a week; 5-7 days a week; 1-3 days a month and never). 13 The nutritional quantifications of the foods consumed will be performed with the help of AVANUTRI® version 3.1.1 software, in which the absolute intake of macronutrients (carbohydrates, proteins and lipids) will be calculated.

Physical activity level assessment: Regarding physical activity, the International Physical Activity Questionnaire (IPAQ) will be used. The short version consists of six questions related to the physical activity performed in the last week for at least 10 continuous minutes, prior to the application of the questionnaire. According to the classification of the instrument, the person is considered:

A- Very Active: The one who complies with the recommendation:

1. Vigorous: ≥ 5 days a week and ≥ 30 minutes per session and/or;

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2. Vigorous: ≥ 3 days a week and ≥ 20 minutes per session + Moderate and/or Walking

≥ 5days a week and ≥ 30 minutes per session.

B- Active: The one that complies with the recommendation:

1. Vigorous: ≥ 3 days a week and ≥ 20 minutes per session and /or;

2. Moderate or Walking: ≥ 5 days a week and ≥ 30 minutes per session and/or;

3. The sum of any activity ≥ 5 days a week and ≥ 150 minutes per week

(vigorous+walking+moderate).

C- Irregularly Active: Those who engage in physical activity, but not enough to be classified as active, for not meeting the recommendations as to frequency and duration. D- Sedentary: those who did not choose to engage in physical activity for at least 10 consecutive (continuous) minutes during the week.

Anthropometric evaluation: To evaluate body fat percentage, lean mass index, and BMI, the leg-leg electrical bioimpedance method (TANITA TBF-300A) will be applied. The patients will wear light clothing and will be barefoot and in orthostatic position. For BMI classification, the categorization proposed by the World Health Organization (1997) will be adopted: underweight (BMI <18.5 kg/m²), normal (BMI between 18.5 and 24.9 kg/m²) overweight (BMI between 25 and 29.9 kg/m²), and obesity (BMI ≥30 Kg/m²).

The measurement of waist circumference will be performed with the person standing erect, abdomen relaxed, arms extended along the body and legs parallel, slightly apart. With the help of a non-elastic tape measure, hold the zero point of the tape with one hand and with the other hand pass the tape around the waist, always verifying that the tape will be at the same level in all parts of the waist. Performing the data reading immediately after expiration, for men above or equal to 94 cm high risk and greater than or equal to 102 very high risk, and for women above or equal to 80 cm high risk and above or equal to 88 cm very high risk.[10]

Assessment of self-care behavior: A Questionnaire of Diabetes Self-Care Activities (QAD) will be applied, a version translated, adapted and validated for use in Brazil of the Summaryof Diabetes Self-Care Activities Questionnaire (SDSCA). The SDSCA is a self-administered instrument, specific for the assessment of diabetes self-care activities, and has 15 assessment items, distributed in seven dimensions: "general eating habits" (two items), "specific eating habits" (three items), "physical activity" (two items), "blood glucose monitoring" (two items), "foot care" (three items), and "medication use" (three items, used according to the drug regimen). This instrument evaluates the performance of a certain behavior in days per week, so the scores for each item can range from zero to seven, and higher scores indicate better results. In the items of the specific eating dimension, the values will be reversed (if 7=0, 6=1, 5=2, 4=3, 3=4, 2=5, 1=6, 0=7 and vice versa), (SDSCA) revised.[26]

Health education interventions: The health education interventions will be promoted by the students and the instructor, who will invite health professionals to hold lectures focused on raising awareness of self-care, proper nutrition, and sports practice, answering questions and providing more knowledge about NCDs.

Blood glucose evaluation: A glycemic test will be performed with an Accu-check glucometer. The monitoring, by an academic at the Family Health Strategy Unit, with digital glucometer (ACCU - CHEK Performa, Roche), ACCU-CHEK Multiclix lancet and respective lancets, graduated from 1 to 5 in increasing degrees of skin penetration depth. The measurements will be performed on the palmar surface of the distal phalanx of the 3o finger of the right hand (ANNEX B).

Blood pressure measurement: Blood pressure will be measured with a sphygmomanometer and stethoscope. The measurement will be performed by a nursing technician in the outpatient setting, with a sphygmomanometer, placing the cuff firmly about 2 cm to 3 cm above the antecubial fossa, centering the rubber bag over the brachial artery. The width of the rubber bag of the cuff should correspond to 40% of the arm circumference and its length should involve at least 80% of the arm, while monitoring the beats with the stethoscope that will position its hood gently over the brachial artery in the antecubial fossa, avoiding excessive compression.[27–29]

Data treatment and analysis

To characterize the sample universe researched, descriptive analysis will be used with mean and standard deviation and the simple frequencies and percentages of the variables analyzed. To check the existence of association between the categorical variables, the chi-square statistical test will be used and the Student's t-test will also be used with the purpose of comparing the mean of anthropometric characteristics and metabolic parameters. It will be considered as level of significance, the value of ($p<0.05$) established by the package "Statistical Package for The Social Science" (SPSS) version 22.0.

Ethical considerations

The study will be submitted to the Research Ethics Committee of the Faculdade Integradas do Norte de Minas - Funorte, where it will be subject to prior approval to conduct the study according to the Resolution of the National Health Council (CNS) No. 466, December 2012 that deals with research involving human beings, ensuring the subjects involved in the sample, data prevention and confidentiality for participation in the research.

Risks, benefits and feedback

• **Risks**

Considering that every research offers some type of risk, in this research the risk can be evaluated as: the participant may feel uncomfortable answering questionnaires with personal questions, in addition to the risk of discomfort regarding the duration of the research. Such risks will be minimized in the following way: the research will be conducted in a private place, and will try to use as little time as possible.

This project may eventually involve pain, contamination of samples when performing tests, and also the risk of falling during the weight check when stepping on the scales. However, the procedure will be performed on an individual basis and during the performance, a health care team will be available to accompany the procedures.

There is the risk of a breach of confidentiality, however, this risk will be minimized, since the preservation of the participants' identities will be guaranteed, since the data collection instruments request personal data from the individuals, but these questionnaires will only be handled by the research team, filed, and properly incinerated after the scheduled period.

• **Benefits**

As for the benefits of the research, both for the knowledge of the participants and for the Family Health Strategy (FHS), the results obtained by this research may provide subsidies for the Municipal

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Health Secretariat of Montes Claros - MG to develop strategies for nutritional interventions in health education to improve the quality of life of diabetic and/or hypertensive users through changes in lifestyle habits.

- **Feedback**

Publication of the article, presentation of the banner in college, and a scientific technical report that will be delivered to the Family Health Strategy.

Execution schedule

Table 1

Table 1 Execution schedule

	Feb	Sea	Apr	Mai	Jun	Jul	Aug	Set	Out	Nov	Ten
Activities											
Choice of theme		X									
Problem elaboration		X									
Elaboration of the general and specific objectives		X									
Elaboration of the justification				X							
Literature review	X	X	X	X	X	X	X	X	X	X	
Methodology				X							
Qualification of the End of Course Work (TCC)					X						
Submission to the Research Ethics Committee					X						
Data Collection							X	X			
Data Tabulation								X			
Analysis of the results										X	
Review and completion of the project (TCC Defense)										X	
Presentation of results										X	X
Sending the report to the ethics committee										X	X

Financial budget

Table 2

Table 2 Financial budget for research expenses

Expense specifications	Quantity	Unit of measurement	Unit value (R$)	Total (R$)
Print	480	480	0,20	96,00
Transportation/Fuel	30 L	30 L	4,65	139,5
Pen	10	10	0,60	6,00
Translation	I	I	80,00	80,00
Banner	I	I	35,00	35,00
Simple binding	5	5	3,00	15,00
Glucometer	I	I	59,00	59,00
Reagent Strips	2	2	49,00	98,00
Total Value				528,50

Source: Montes Claros - MG trade

Resources: authors themselves

Execution schedule

Acknowledgments

None.

Conflicts of interest

The author declares that there is no conflict of interest.

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Funding

None.

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