Risks of cerebral vascular disease in teachers and university employees

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Abstract

Noncommunicable diseases, commonly known as non-chronic or lifestyle-related diseases are cardiovascular diseases, diabetes, cancer and chronic respiratory diseases, which cause almost 80% of the deaths attributable to them. Objective. To determine the risks of Cerebral Vascular Disease in Teachers and University Employees. Methodology. Non-experimental, descriptive and transectional study. The sample was made up of 225 professors and university employees. A non-probabilistic sampling was done for convenience. An instrument was designed that, when piloting, obtained an acceptable reliability with Cronbach's alpha of 0.690, structured in three sections with dichotomous questions. Contribution. It will enable the institution to implement strategies aimed at promoting healthy lifestyles among academic staff and employees. With the adoption of healthy behaviors will promote the prevention of noncommunicable diseases that in future represent high costs to the health services and the institution due to the temporary and / or permanent incapacities that, if condition present.

Hypertension, Diabetes, Cancer

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Introduction

Cerebrovascular disease (CVD) is a clinical syndrome characterized by rapid development of focal neurological signs, which persist for more than 24 hours. No other apparent cause than vascular origin. It is classified into two subtypes, ischemia and hemorrhage. (Arauz, 2012). According to WHO, CVD is a public health problem and is the second leading cause of death in low- and middle-income countries. If no effective interventions are made by 2030 it will increase to 44%. According to the Secretary of Health, in Mexico since 2000 to date mortality for this cause has increased.

Health situation in Michoacán reflects a complex scenario, changes in demographic structure, as well as in habits and lifestyles, have generated changes in the epidemiological profiles of the population, combat historical problems such as infant mortality, maternal mortality, transmission by infectious diseases and, on the other hand, to prevent and treat noncommunicable diseases derived from the aging of the population and an unhealthy lifestyle.

The Michoacan University of San Nicolás de Hidalgo has a teaching staff of about 3500 teachers and about 3000 employees. In both cases, risk behaviors have been observed for cardiovascular and endocrine diseases, because problems have been identified with lack of physical activity, consumption of tobacco, stress and food, with respect to the latter, people are not in the habit of taking food from their homes and regularly buy it in places where fast food is sold. It is common for employees to take half an hour to eat food, and these are not always healthy, if they are considered to be regularly purchased near their work center.

These consist of coffee with cookies or bread, cakes, tacos, toast, baguettes, fruit, among others. In addition to the consumption of food with low nutritional value such as churros, fries and sweets. Therefore, this research was done with the objective of determining the risks of cerebral vascular disease in university professors and employees. This will allow the search for institutional strategies to promote healthy behaviors and eliminate or reduce risk behaviors in order to prevent future health problems that condition temporary or permanent disabilities, especially if we consider that it is a young population that in the future would imply for the institution and the society greater expenditures on health.

Epidemiological data

In 2011, world leaders, recognizing the devastating impact of NTD (non-transmitted diseases), adopted a policy with firm commitments and entrusted WHO with supporting the efforts of countries, through the development of a Global Plan of Action for prevention and control of non-transmitted diseases 2013-2020 (known as the WHO Global Plan of Action on NTD), this includes nine global targets for voluntary implementation and a global monitoring framework. These were adopted by the World Health Assembly in 2013. (WHO. 2016).

It is important that countries give priority to interventions aimed at reducing the harmful use of alcohol, insufficient physical activity, salt or sodium intake, smoking and hypertension; halt the rise in obesity and diabetes, and improve treatment coverage to prevent heart attacks and strokes, and access to basic technologies and medicines (Who's Report, 2014).

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NTDs are the leading cause of death in the world, causing 38 million (68%) of the 56 million deaths recorded in 2012. More than 40% (16 million) were premature deaths occurring before age 70 old. Nearly three quarters of all NTD deaths (28 million) and most of the preterm deaths (82%) were in low- and middle-income countries. For the period 2011-2025, the cumulative economic losses in these countries in the hypothesis of maintaining the current situation, are estimated at US $ 7 trillion. This huge cost of inaction far outweighs the annual cost of implementing a set of strong impact interventions to reduce NTD burden ($ 11.2 billion per year). (WHO, 2014)

At present, Mexico and the United States, are the first place of world prevalence of obesity in the adult population (30%). (Barrera, 2013). According to INEGI in 2015, the 10 main causes of mortality in Mexico were heart disease (ischemic heart disease), diabetes mellitus, malignant tumors, accidents (motor vehicle traffic), diseases of the liver (alcoholic liver), cerebrovascular diseases (CVD), chronic obstructive pulmonary diseases, aggressions, influenza and pneumonia, and renal failure.

At the national level, cerebrovascular diseases ranked fourth in women and seventh in men. In 2011, in the State of Michoacán, diabetes mellitus, ischemic heart diseases, cerebrovascular diseases and lower respiratory tract chronicles were the main causes of death in the population; these caused 35.8% of the total deaths. (Health Secretary, 2014).

By 2015 in the state of Michoacán, CVDs ranked fifth as causes of mortality and according to sex, in men aged 45-64 years was found in seventh place and fifth place in women. It should be mentioned that according to the main results of the Intercensal Survey 2015, the State of Michoacán is among those that do not reach 80% of its population affiliated to an institution that offers health care services, however, this condition should not affect teachers and university employees because a social benefit is the affiliation to the Mexican social Security Institute (IMSS), in the case of teachers, provided they impart the number of hours required to apply the provision.

Lifestyle

Lifestyle is a construction of the individual, molded by family, education and society. In epidemiology the term lifestyle is understood as a set of behaviors that people develop, which are sometimes healthy and others are harmful to health. (Cited by Guerrero, 2010)

Among the eating habits associated with weight gain is eating out frequently. Also eating at restaurants and places that sell fast food impacts negatively on the health of people. The dietary habits of the countries of Latin America are related to the sociodemographic, economic and dietary changes that the population has had.

This results in increased consumption of foods rich in saturated fats, cholesterol, sugars, refined flours and sodium among others. Bringing as a consequence the increase in chronic non-transmitted diseases and obesity (Schnettler, 2013).

Healthy lifestyles promote the acquisition and maintenance of individual and collective behavior patterns that improve the quality of life: it includes behavior patterns, beliefs, knowledge, habits and actions of people to maintain, restore or improve their health, well-being and quality of life. The well-being of people is associated with their diet, sociodemographic characteristics, preferences for certain foods with a good health and with the pleasure associated with food. (Schnettler, 2013).

Non-transmitted diseases (NTDs) represent one of the greatest challenges of the 21st century for health and development, both for the human suffering they cause and for the harm they cause to the socio-economic fabric of countries, especially those of low and medium income. Non-transmitted diseases, commonly known as non-chronic or lifestyle-related diseases are cardiovascular diseases, diabetes, cancer and chronic respiratory diseases, these cause almost 80% of the deaths attributable to these diseases. They share four major risk factors, including tobacco use, poor diet, sedentary lifestyle, and harmful use of alcohol. These diseases represent an important burden in low- and middle-income countries.

The highest increase in the prevalence of obesity between 1999 and 2006 was observed in the indigenous population (<15% per year). These trends suggest that Mexico is carrying an excessively heavy burden of weight for the poorest population at all ages.

The patterns of consumption in Mexican households between 1992 and 2010 are different according to income level. Households with lower income decide on spending that allow them to consume a higher level of calories at a lower price, but of lower nutritional quality. (Rivera, 2012).

The evaluation of nutritional status in adults aged 20 years and over showed a prevalence of overweight and obesity by sex, 74.6% in women and 70.2% in men, with a Body Mass Index greater than or equal to 30kg / m2. It was 48.9% and 36.8%, respectively. In the last six years the prevalence increased 2.4% in men and 3.8 in women. (State Strategy. 2015)

Cardiovascular risk factors

Cardiovascular risk factors (CVRF) associated with CVD include those of a non-modifiable type such as: age, gender, family history, race and other modifiable ones, susceptible to therapeutic intervention such as systemic arterial hypertension (SAH), coronary artery disease, dyslipidemia, diabetes mellitus (DM) and smoking, among others. Both relative (RR) and attributable (AR) risk are very high. (Rodríguez, 2010). The most important predictor of fatal event is the pulse pressure which is an indicator of hardening of the aorta. (Alcalá, 2010)

Unplanned urbanization, the aging of the population, the globalization of trade and products, especially tobacco, alcohol and food, have led to an increase in risk factors. Lack of capacity to provide medical care and social protection systems increases the risk of contracting diseases and the person dies at an earlier age (United Nations General Assembly Report, 2011).

The main risk factors for mortality from diseases such as diabetes mellitus, ischemic heart disease and cerebrovascular disease were overweight and obesity, high blood glucose concentrations, alcohol consumption and smoking, solely obesity and high glucose explained 25.3% of the total deaths in the country (Rivera, 2012).

With regard to age, it has been estimated that for every decade after 55 years the risk of CVD is doubled. Some authors point to another factor that can not be modified race or ethnicity, based on the great differences between African Americans, US Indians, Hispanics and the white population, especially among those under 65 years of age.

Smoking represents a Relative Risk (RR) of 1.8 for CVD. Likewise, diabetes mellitus, since it is a risk factor that in turn produces macrovascular changes that result in hypertension. Asymptomatic carotid stenosis, which increases the risk of CVD in a manner proportional to the degree of obstruction of the affected artery, although when there are almost total degrees of obstruction and the RR does not increase anymore. (Alcalá, 2010).

To avoid the most important modifiable risk factors there are two levels; to prevent the occurrence of risk factors for cardiovascular disease (obesity, smoking, physical inactivity) and to treat diseases such as hypertension, considered as a special risk factor. (Alcalá, 2007). The DASH diet (Dietary Approach to Stop Hypertension) includes eight types of food: fruits, vegetables, cereals, nuts, legumes, low-fat dairy products, few red meats processed and low sugar and sodium drinks (Ruiz, 2010).

According to the body mass index (BMI), it is considered overweight when it is 25 to 29.9 and obesity when it is ≥ 30. In relation to the waist circumference (WC), abdominal obesity according to the International Diabetes Federation (IDF) occurs when the WC is greater than 90 cm in men and 80 cm in women. The WC is measured with a flexible tape measure in the middle between the costal border and the iliac crest.

The patient should inhale and then remove all the air a couple of times and thus obtain the measurement. In our country the prevalence of overweight and obesity is 70% according to BMI, while 84% of women and 64% of men have abdominal obesity according to the definition above.

Sedentary lifestyle and physical exercise are two factors that have an impact on the risk of CVD, lifestyle changes have led people to lead a sedentary life, that is, they remain for a long time sitting or not moving, whose situation conditions problems of overweight and / or obesity. A meta-analysis of 18 studies showed a decreased risk of CVD or death of 27% if intense physical activity was performed well before the event (RR: 0.73; 95% CI 0.67 to 0.79, p <0.001) compared with the activity light physics. The risk reduction for HF was 21% (RR: 0.79; 95% CI 0.69 to 0.91, p <0.001) and for ICH 34% (RR: 0.66; 95% CI 0.48 to 0.91, p <0.001). the Framingham Registries, the Olso Study and the Nurses Health Study of Copenhagen have shown that physical exercise reduces the risk of premature death and cardio and cerebrovascular disease in men as well as in women. (Ruiz, 2010)

In 2014, the WHO in the Report on the World Situation of the Prevention and Control of NTDs establishes nine global goals, listed below, taking into account that each one identifies risk factors for NTD as the CVD:

Global target 1: Relative reduction of overall mortality from cardiovascular diseases, cancer, diabetes or chronic respiratory diseases by 25% by 2025.

Global target 3; relative reduction of the prevalence of insufficient physical activity by 10% by 2025. Insufficient physical activity contributes to causes the loss of 69.3% million DALYs and 3.2 million deaths each year.

The risk of death from any cause is higher in adults whose physical activity is insufficient than in those who practice at least 150 minutes of moderate physical exercise per week or its equivalent as recommended by the WHO. Regular physical activity reduces the risk of ischemic heart disease, stroke, diabetes, and breast and colon cancer.

By 2014, 23 per cent of adults aged 18 and over were not active enough, women were less active than men and older people were less active than young men. In recent years, more low- and middle-income countries have established initiatives to address the problem of physical inactivity. Achieving this goal requires the multisectoral collaboration of the departments of transportation, urban planning, recreation, sports and education, in order to create safe environments conducive to physical activity for all age groups.

Global target 4: Relative reduction in average salt or sodium intake by 30% by 2025. Excessive consumption of sodium in the diet has been associated with an increased risk of hypertension and cardiovascular disease. Globally, 1.65 million deaths annually from cardiovascular causes have been attributed to an excessive sodium intake. The average worldwide intake of salt is of the order of 10 g daily (3.95 g / day of sodium).

The WHO recommends a reduction in salt intake of less than 5g / day (2 g / day of sodium) to reduce blood pressure and the risk of coronary heart disease and stroke.

In some countries, the main source of salt is processed foods and precooked foods, while in others salt is added during food preparation at home and at the table. It is worth mentioning that by increasing the availability of processed foods, they quickly become the main source of sodium.

Global target 5: Relative reduction in the prevalence of current tobacco use by 30% for people aged 15 years or more by 2025. An estimated six million people are currently dying from tobacco use, including more than 600,000 deaths due to exposure to foreign smoke, of which 170 000 are children. The measures for reduction are: to protect people from exposure to second-hand smoke through national legislation on "100% smoke-free environments"; offer help to quit smoking, and warn people about the dangers of smoking.

Global target 6: Relative reduction in the prevalence of hypertension by 25% to contain the prevalence of hypertension, depending on the circumstances of the country by 2025. It is estimated that hypertension has caused 9.4 million deaths and 7% of the burden of morbidity -expressed in DALY- in 2010. Uncontrolled hypertension is a cause of stroke, myocardial infarction, heart failure, dementia, renal failure and blindness. The global prevalence of hypertension (defined as systolic and / or diastolic blood pressure equal to or greater than 140/90 mmHg) in adults 18 years of age or older was 22% in 2014.

The modifiable factors are: consumption of foods that contain too much salt or fat, insufficient intake of fruits and vegetables, overweight and obesity, harmful use of alcohol, physical inactivity, psychological stress, socioeconomic determinants and access inadequate to health care. At the global level, detection, treatment and control are insufficient because of the precariousness of health systems, particularly at the primary care level. (Report 2014. Page IX). Establish comprehensive programs at the primary care level to enhance the effectiveness of screening, diagnosis and treatment.

Global target 7; detection of increased diabetes and obesity by 2025. Obesity increases the likelihood of diabetes, hypertension, coronary heart disease, stroke and certain cancers. Globally, obesity has almost doubled since 1980. By 2014, 10% of men and 14% of women aged 18 and over were obese. The global prevalence of diabetes in 2014 was estimated at 10%. Obesity and diabetes can be prevented through multisectoral action that contributes to the production, distribution and marketing of food and creating environments that facilitate and promote physical activity. The risk of diabetes can be reduced by moderate weight loss and moderate daily physical activity.

Global target 8. Pharmacological treatment and counseling (including blood glucose control) for at least 50% of people who need it to prevent heart attacks and strokes by 2025.

Cardiovascular diseases were the leading cause of death by NTD in 2012 and were responsible for 17.5 million deaths, or 46% of deaths from NCDs. An estimated 7.4% were due to heart attacks (ischemic heart disease) and 6.7 million to strokes.

An intervention that can be carried out at the primary care level is the improvement of the coverage of pharmacological treatment and the counseling of people exposed to a high cardiovascular risk or who already suffer from the disease.

Since 1980, obesity has doubled around the world. By 2014, more than 1900 million adults aged 18 and over were overweight, of whom more than 600 million were obese. By 2014, 39% of adults aged 18 and over were overweight and 13% were obese. Most of the world's population lives in countries where overweight and obesity charge more people's lives than underweight. Being overweight and obese, they are defined as an abnormal or excessive accumulation of fat that can be harmful to health.

The Body Mass Index (BMI) is a simple indicator of the relationship between weight and height that is frequently used to identify overweight and obesity in adults.

In adults, the WHO defines overweight and obesity as: overweight: BMI equal to or greater than 25. Obesity equal to or greater than 30.

BMI provides the most useful measure of overweight and obesity in the population, since it is the same for both sexes and for adults of all ages. However, it should be considered as an approximate value because it can not match the same level of thickness in different people. A high BMI is an important risk factor for noncommunicable diseases such as:

Cardiovascular diseases (heart disease and cardiovascular accidents) that were the leading cause of death in 2012.

Diabetes. Disorders of the locomotor system (especially osteoarthritis, a degenerative joint disease and very disabling), and some cancers (endometrium, breast, ovaries, prostate, liver, gallbladder, kidneys and colon). The risk of contracting these non-transmitted diseases grows with increasing BMI.

Overweight and obesity can be prevented when people choose to: limit the energy intake that comes from the amount of total fat and sugars, increase consumption of fruits and vegetables, as well as pulses and whole grains and nuts; and regular physical activity (60 minutes a day for young people and 150 minutes a week for adults). Individual responsibility is fundamental to having an effect on a healthy way of life. It is therefore essential to consider what the NOM 043 establishes.

Obesity (BMI $\geq 30 kg/m^2$) is a systemic, chronic and multi-causal disease, not exclusive to economically developed countries, involving all age groups, of different ethnicities and social classes. It has reached epidemic proportions worldwide, which is why the World Health Organization (WHO) has called it the epidemic of the 21st century (Davila, 2015). According to the (WHO) obesity is the most frequent non transmitted chronic disease. The WHO defines overweight and obesity as an abnormal or excessive accumulation of fat. In addition, there is evidence that this condition is the main risk factor for the development of chronic nontransmitted diseases, it is estimated that 90% of type 2 diabetes mellitus are attributable to overweight and obesity, as well as cardiovascular diseases, disorders of the locomotor system (osteoarthritis) (IMCO, 2015) and is associated with an increased risk of endometrial, esophagic, renal, pacritic, ovarian, breast, colorectal, thyroid and gallbladder cancer.

It is also associated with leukemia, multiple myeloma, non-Hodgkin's lymphoma, and multiple melanoma. (Mitchel, 2011).

In Michoacán, seven out of ten people are involved with one or more of the diseases such as diabetes, overweight or obesity. (Secretary of Health, 2014).

Considering the above, the following question was raised:

What are the risks of stroke in college teachers and employees?

Objectives

General

To determine the risks of cerebral vascular disease in university professors and university employees.

Specifics

Identify risk factors for stroke in teachers and employees.

Relate risk factors for stroke among teachers and university employees.

Methodology

Non-experimental, descriptive, transectional and exploratory study. The study population was composed of teachers and university employees. A non-probabilistic sampling was done, at the convenience.

We included 225 professors and employees assigned to the university units of Morelia, Michoacán, excluding those who did not wish to do so and those enrolled in the campuses outside Morelia. After informed consent, a structured instrument was applied in four sections that was validated with a Cronbach Alpha of 0.729. Being an instrument with an acceptable reliability. Anthropometric measures such as weight, height, hip circumference, wrist circumference, BMI and ICC were taken.

Also, blood pressure was measured, with an aneroid baumanometer of the brand WelchAllin (German), bracelet of 25 to 34 or 32 to 43cms, these were changed according to the complexion of the participant. The measurement was made with the person sitting in a backed chair, not having ingested coffee, not having performed physical activity, or having climbed stairs 30 minutes prior to the intake, according to NOM 030. A sample was taken of peripheral blood to measure glucose, cholesterol and triglycerides. A sterile lancet was punctured and a test strip was used for each of the parameters to be measured. The apparatus used for this was the Accutrend Plus Cobas (German). The participant should be fasting for at least 8 hours. Stature was measured using a digital scale and BMI was calculated. The research was done in accordance with the health research guidelines and the Helsinky Declaration.

Results

According to the analysis, the following results were obtained:

60% (135) of the respondents were women and 40% (90) men. The $\dot{X}$ of the height was of 162.8 mts and weight 72.0 kgs.

| Age	Frecuency	%
26 - 31 y/o	28	12.4
32 - 37 y/o	45	20.0
38 - 43 y/o	47	20.9
44 - 49 y/o	49	21.8
50 y/o or more	56	24.9
Total	225	100.0

Table 1 Age of teachers and employees. Morelia. 2017
Source: 225 Questionnaires applied to teachers and employees

The $\dot{X}$ age was 43 years, 24.9% were 50 and over, 21.8% were 44 - 49 years old. The rest of the respondents are shown in table 1.
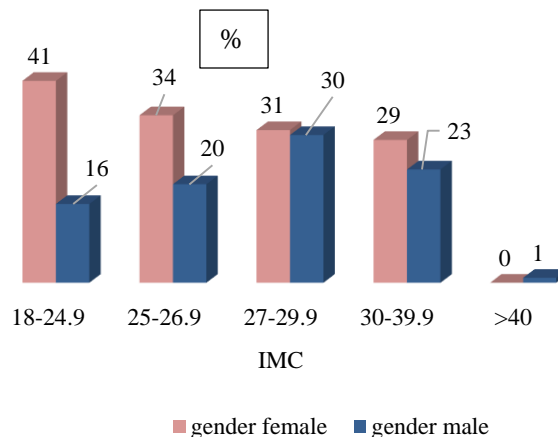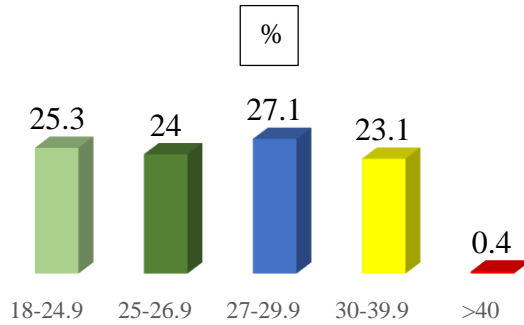

Graphic 1 Sex and BMI of teachers and employees
Source: 225 Questionnaires applied to teachers and employees

Regarding gender and BMI, a greater number of women with above normal BMI parameters were found in relation to men.
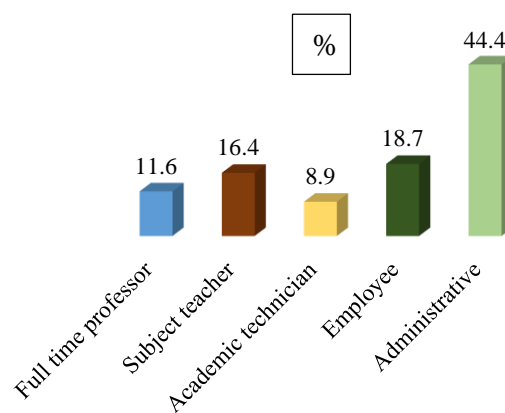
Graphic 2 Category of participants. Morelia, 2017
Source: 225 Questionnaires applied to teachers and employees

Of the total respondents, 44.4% (100) were administrative staff, 18.7% (42) employees, 16.4% (37) professor of the subject and the rest full-time professor and academic technician.

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Graphic 3 Participants BMI
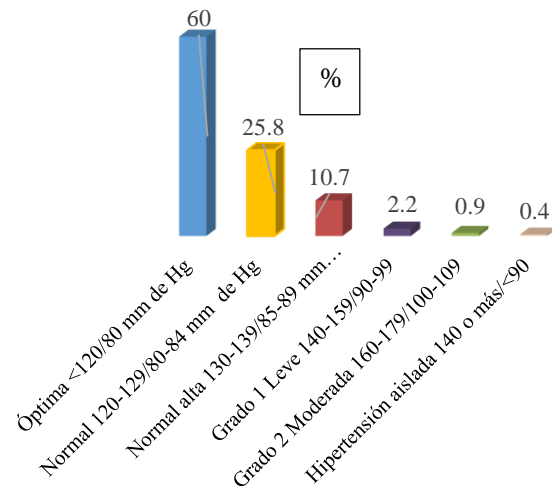*Source: 225 Questionnaires applied to teachers and employees*

Regarding the Body Mass Index, 25.3% (57) had a normal BMI of 18 - 24.9, 27.1% (61) of 27 - 29.9, 24% (54) 25 - 26.9, and the rest lower percentages, as shown in graph 3.

Item	Yes		No	
	FREC	**%**	**FREC**	**%**
Smokes	44	19.6	181	80.4
Lives with smokers	88	39.1	137	60.9
Family history of diabetes	163	72.4	62	27.6
Family history of hypertension	153	68	72	32
Performs physical activity at least 45 minutes three times a week	70	31.1	155	68.9

Table 2 Risks related to smoking habits and hereditary family history. Morelia, Michoacán, 2017
Source: 225 Questionnaires applied to teachers and employees

Regarding smoking habits, 19.6% (44) smoke, 39.1 (88) live with smokers, thus becoming passive smokers. 72.4 (163) had a family history of diabetes mellitus, 68% (153) reported a history of hypertension. In relation to performing physical activity at least 45 minutes three times a week, 68.9% (155) does not and 31.1. (70) does.

Graphic 4 Blood Pressure of Teachers and Employees

Source: 225 Questionnaires applied to teachers and employees

85.8% had an optimal or normal blood pressure, however, 14.2% (32) presented some alteration in the figure obtained, as shown in figure 1.

Cholesterol	Frecuency	%
Less than 100	6	2.7
Normal <100	6	2.7
High 160-189	70	31.1
Very High >190	143	63.5
Total	225	100.0

Table 3 Cholesterol of teachers and employees. Morelia, Michoacán
Source: 225 Questionnaires applied to teachers and employees

The average stood at 196.8, median and mode in 200. 63.5% (143) had cholesterol> 190, 31.1% (70) 160 -189. As shown in Table 3.

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Statistical significance was found between the variables consumption of fatty meats and age with a value of r = .303 p = .000, adding salt or sugar to foods with systolic pressure, with a value of r = .230 p = .000 , as well as obesity with having a relative with hypertension with a Chi2 0.009 and RR = 2.357 (1,129 - 4,921), studies to determine cholesterol with a value of Chi2 .017 and RR = 1,613 (1,049 - 2,479). As well as the BMI with waist measurement with a value of r=.716 p=.000

Conclusion

The risks that were determined and identified in CVD in teachers and employees are hereditary family history of diabetes, arterial hypertension, Body Mass Index above normal limits, since seven out of ten of the respondents presented alteration. Although the number of smokers is not important, if we add those who live with smokers, the risk increases. Seven out of ten do not engage in physical activity. So they have four and more risk factors. It is important to implement strategies to improve behaviors related to healthy lifestyle in the study population, such as: Encourage physical activity, go to the doctor routinely to promote health and prevent diseases, healthy eating and balanced according to their needs taking into account what is established in NOM043.

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