

# Cardiovascular Risk Factors in Nurses Teachers

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## ABSTRACT

**Background:** Cardiovascular diseases are the main cause of death in Brazil and worldwide, being influenced by the presence of risk factors. In the current life context, these factors are increasingly present in individuals, also related to occupation, which require extensive workload, performance, reasoning, goal plan and maximum dedication from the individual, as is the case of undergraduate teachers in Brazil.

**Objective:** To identify cardiovascular risk factors in teaching nurses of a private higher education institution (HEI) in Belém, PA, Brazil.

**Study design:** A cross-sectional, descriptive survey study with a quantitative approach. At a private HEI in Belém-PA, in March and April 2019.

**Methodology:** Performed with 11 teachers nurses that the HEI had. A form was used on the teacher's profile and risk factors. Data were analyzed by simple descriptive statistics through the Bioestat 5.0 program.

**Results:** They are young adults, married, with an extensive workload; 45.45% of them have already had alterations in the HDL and LDL levels, with a family history of Systemic Arterial Hypertension 72.73% and Diabetes Mellitus 81.82%. 45.45% use oral contraceptives. They have a low-fiber diet, rich in lipids and sodium, and practice physical activity. 72.73% consume alcoholic beverages, and none are smokers.

**Conclusion:** The teaching profession, due to extensive workload and stressful activities, offers a risk for inadequate nutrition, sedentary lifestyle, and lack of time for leisure. These factors are associated with other existing factors, which may increase the chances of cardiovascular diseases in these professionals.

*Keywords: Cardiovascular diseases; Risk Factors; Prevalence; Education, Nursing, Baccalaureat.*

## 1. INTRODUCTION

Cardiovascular diseases (CD) represent the main cause of death in Brazil and worldwide, reaching a rate of 31.1% of the cause of all deaths in Brazil, surpassing all other causes [1]. According to the World Health Organization (WHO), the incidence of cardiovascular diseases tends to continue to increase in developing countries, as a response of how the population lives, consequences of unhealthy living habits. Systemic Arterial Hypertension and Diabetes Mellitus are the main causes of cardiovascular events, ischemia, stroke [2].

There are other risk factors that help in its evolution, such as dyslipidemia, smoking, sedentary lifestyle, obesity, abdominal fat. These risk factors have so far been considered important only in the elderly, but lately studies have shown that they are already considered in young adults and children [3].

Another important aspect is that nowadays technologies are increasingly dominating our daily lives, providing facilities in daily tasks, but directly influencing the decrease in physical activity [4].

In the current life context, cardiovascular risk factors are increasingly present in individuals, also related to occupation, which require from the individual extensive workload, performance, reasoning, plan of goals and maximum dedication, as is the case of the undergraduate teacher in Brazil, which is characterized by an exhausting profession, with extensive workload, stress, student and coordinator charges [2].

An undergraduate professor in Brazil works forty hours a week, including specific postgraduate modules on some weekends, exceeding forty hours, not including overtime dedicated to class preparation, research and improvement study. In addition, the teacher conducts classes with various methodologies that demand time and creativity, supervise internal and external practices, guide research and are coordinators of research and extension projects. In addition to teaching, they also assume internal administrative positions in higher education institutions, coordinating courses, departments and centers. They participate in congresses, course-end workbenches, symposia, seminars and mini-courses, all under extreme pressure from students and coordinators at all times [5].

All these aspects that constitute the work of the teacher, can affect your cardiovascular health. The concern with this condition led to the following guiding question: What are the cardiovascular risk factors in teaching nurses of a private HEI in Belém, PA? Being the objective of this study: To identify the cardiovascular risk factors in teaching nurses of a private HEI in Belém-Pará.

## **2. MATERIAL AND METHODS**

This is a cross-sectional, descriptive, quantitative field study of the survey type. It was conducted in a private Higher Education Institution located in Belém, PA, in the period of March and April 2019, having as participants teachers of the Bachelor's Degree in Nursing.

The study population was characterized by 32 teachers. However, this study included only teachers with higher education in Nursing, thus the population decreased to 11. Thus, for the inclusion criteria: teachers, Nurses of both genders in the nursing course, with at least six months of experience. For exclusion, teachers on vacation, maternity leave, medical certificate and who were not nurses.

For the sampling, it was chosen to reach the entire population, because it is a small number, so the researchers contacted the teachers, presented the objectives of the study and made the invitation. In this way it was possible to reach the 11 teachers.

For data collection, a three-part form was used, the first on the profile of the participants and the profession (gender, age, marital status, skin color, children, years of study, weekly workload and years of profession). The second part aimed to analyze the cardiovascular risk factors (pre-existing disease; Systemic Arterial Hypertension or Diabetes Mellitus; Cardiovascular Event; Changes in LDL and HDL levels; Uses some medication; Family History; Smoker; This study was developed by researchers, based on the I BRAZILIAN DIRECTRIZ OF CARDIOVASCULAR PREVENTION 2013 of the Brazilian Society of Cardiology and the Manual of Cardiovascular Prevention 2017 of the Society of Cardiology of the State of Rio de Janeiro (SOCERJ). And the third part on eating habits and physical activity.

For the application of the form, prior scheduling was performed, and the best moment was combined, which was performed at the HEI itself, in a reserved room provided by the coordination of the Nursing course, in the morning, afternoon and evening shifts. The mean time for each application of the form was ten minutes, in which they occurred in the moments of interval between one shift and another.

For data analysis, we opted for simple descriptive statistics, with the help of the Bioestat 5.0 program, describing the percentage of variables and presenting them in tables. The first part corresponded to the profile of the participants and characteristics of the teaching profession, the second with cardiovascular risk factors, and the third with eating habits and physical activity.

Resolution 466/12 was respected, which establishes criteria for research involving human beings, based on its principles, so data collection began after the approval of the Ethics and Research Committee (CEP) of the Metropolitan University Center of the Amazon UNIFAMAZ, with the Opinion Number: 3,262,724. All participants signed two copies of the Informed Consent Form (ICF), one of which was with the participant and the other with the researchers.

### 3. RESULTS

To describe the results, tables were prepared with a demonstration of the data produced and described below from four categories that portray the cardiovascular factors of the participating teachers. It is also characterized who these participants are in their personal and professional aspects.

It begins by characterizing the profile of the participants, shown in tables 1 and 2.

**Table 1. Profile of participants, Private HEI Nursing Professors. Belém (PA), Brazil, 2019.**

Variables	Classification	N	%
Genre	Female	8	72,73%
	Male	3	27,27%
Age	26 – 30	2	18,18%
	31 – 35	2	18,18%
	36 – 40	2	18,18%
	41 – 45	2	18,18%
	46 – 50	2	18,18%
	51 – 55	1	9,09%
Color	Brown	8	72,73%
	White	2	18,18%
	Black	1	9,09%
Marital status	Married	7	63,64%
	Single	1	9,09%
	Stable union	3	27,27%

Children	Yes	7	63,64%
	No	4	36,36%

Most of the participants in the study are female, aged between 26 and 50 years, who declare themselves to be brown, married or in a stable union and with children. It is observed, therefore, a population of young adult teachers in the institution.

On the professional profile, there are teachers with an average of 15 years of profession, who have an average of 21 years of study and work an average of 40 hours per week. Thus, it is observed that they already have professional experience and are in an extensive workload.

To describe the cardiovascular factors, four categories were identified from the conduct of the study, through which its results are presented. The first category presents the cardiovascular risk factors related to pre-existing diseases, family history and social life habits, as described below. Table 2 presents the related cardiovascular factors, physical health, family history and social life habits of the participants.

**Table 2. Cardiovascular risk factors in the participants. Belém (PA), Brazil, 2019.**

Cardiovascular risk factors	Situasie	Type	N	%
<i>Pre-existing disease</i>	Yes	Asthma	1	9,09%
	No	–	10	90,91%
<i>Has SAH or DM</i>	Yes	–	0	0%
	No	–	11	100%
<i>Have you ever had a cardiovascular event</i>	Yes	Hypertensive crisis	2	18,18%
	No	–	9	81,82%
<i>Already had changes in LDL and HDL levels</i>	Yes	–	6	54,55%
	No	–	5	45,45%
<i>Usa algum medicamento</i>	Yes	Contraceptives orais	5	45,45%
	No	-	6	54,55%
<i>Family Health History</i>		VEA*	1	9,09%
		AMI <sup>†</sup>	1	9,09%
		CI <sup>‡</sup>	1	9,09%
		DVT <sup>§</sup>	0	0%
		SAH <sup>  </sup>	8	72,73%
		DM <sup>¶</sup>	9	81,82%
		PE**	0	0%

<i>Smoker</i>	Yes	–	0	0%
	No	–	11	100%
<i>Ethylist</i>	Yes	–	8	72,73%
	No	–	3	27,27%

\*VEA - Vascular Encephalic Acid; †AMI - Acute Myocardial Infarction; ‡CI - Cardiac Insufficiency; §DVT - Deep vein thrombosis; ||SAH – systemic arterial hypertension; ¶DM - diabetes mellitus; \*\*PE - Pulmonary Embolism.

As for the vascular risk factors shown in the table above from the participants' information, most do not have arterial hypertension and diabetes mellitus. Although most report that there were no changes in the level of LDL and HDL, a significant portion of the participants (45.45%) already had at some point, changes in these levels, as well as the use of oral contraceptives.

Similarly, most of them have a family history of hypertension (72.73%) and diabetes mellitus (81.82%). They are not smokers, but the majority (72.73%) consume alcohol. The second category demonstrates the eating habits of the participants.

In this category, table 4 shows the type and frequency of foods consumed by the participants.

**Table 3. Participant food, Belém (PA), Brazil, 2019.**

Food	Yes weekly	Yes daily	Not ever	Rarely
Canned	3	0	7	1
Frying	9	0	2	-
Red Meat	10	0	1	-
White Meat	8	3	0	-
Soft Drinks	6	0	5	-
Fruit and vegetables	8	3	0	-

Most participants report consuming weekly, red and white meat, fried food and soft drinks. A significant portion of them report consuming fruits and vegetables on a weekly basis as well. Most do not consume canned food. The use of red and white meat as the main food is therefore predominant.

This category is shown in table 5, and presents whether the participant declares to be sedentary or active, and the types of physical activities that they perform.

**Table 4. Level of physical activity and type practiced by the participants, Belém (PA), Brazil, 2019.**

Sex	Sedentary	Insufficient assets	Active	Very active
Female	1	2	4	1
Male	1	0	1	1
<b>Total</b>	<b>2</b>	<b>2</b>	<b>5</b>	<b>2</b>
Sex	Race	Walk	Bodybuilding	does not
Female	3	2	5	2

Male	2	1	2	1
<b>Total</b>	<b>5</b>	<b>3</b>	<b>7</b>	<b>3</b>

Most participants consider themselves active and very active in relation to physical activity, but four of them are sedentary or insufficiently active.

Regarding the practice of physical activity, this activity includes mainly bodybuilding and running, however, three of these participants are sedentary and do not perform any type of physical activity. Therefore, it is found that most participants are active and perform some form of physical exercise.

#### 4. DISCUSSION

The results of this study highlight the important prevalence of some cardiovascular risk factors, as well as factors related to diet and physical activity that also influence risk factors. Allied to an extensive workload.

It was also shown that 45.45% of the participants had already presented at some point alterations in the levels of LDL and HDL, being this a worrying result.

Corroborating the results of a study conducted in 2010 with 145 teachers with a mean age of 45 years at the Federal University of Viçosa, which showed that 46.9% presented changes in the levels of LDL and HDL, these changes were also related to age over 50 years, and the higher prevalence of males [6]. In the case of this study, it should be noted that the majority are women and up to 50 years of age.

According to the Brazilian Directive on Dyslipidemias and Prevention of Atherosclerosis of 2017, the accumulation of LDL-type lipoproteins in plasma levels causes endothelial lesions, and over the years, an inflammatory reaction in response to lesions. The aggregation of these oxidized lipoproteins attracts macrophages, which, in turn, adhere to the wall of the arteries together with other blood elements such as calcium, and the formation of atheroma plaque, called atherosclerosis, which reduces the lumen of the vessel and offers greater chances of reduced blood flow, affecting the coronary arteries, which, depending on the degree of cause of angina and AMI, is a condition, a high potential risk factor for cardiovascular events, related to inadequate nutrition and genetic factors [7].

It is worth mentioning in this case that in addition to LDL and HDL alteration, most of them have a family history for some cardiovascular disease and a diet in which lipids predominate. This is a relevant factor, since cases of SAH in the family reached 72.73% and DM 81.82%, thus the presence of these chronic diseases in family members increases the chances of their development in the participants in the future.

This situation is also in line with a study carried out with a university population, which totaled 84 teachers, in which the prevalence of cardiovascular risk factors was evaluated, showing that 56% of the teachers had a family history of SAH, and 86.9% of DM, and these results are compatible with the results of this research [8].

It is noteworthy that SHA and DM are the main risk factors for the development of cardiovascular disease. In Brazil, hypertension affects 25.7% of the population, and DM 8.9%, with the presence of both diseases still occurring in 50% of patients, representing high morbidity and mortality. They are influenced by modular and non-modifiable risk factors, but the main cause is still obesity, sedentary lifestyle and stress [9].

For the variable on the use of some medication, 45.45% of the participants, specifically female, use oral contraceptives, which is a considerable factor for the development of cardiovascular events, still being potentialized related to other cardiovascular risk factors.

Contraceptives are a combination of estrogen hormones (in general ethinyl estradiol) and progesterone, which is a reversible and easily accessible method used by 25% of Brazilian women, and which affects the cardiovascular system, since there are receptors of these hormones in all layers of blood vessels. Ethinyl estradiol causes changes in the coagulation system, increasing the generation of thrombin and coagulation factors, decreasing the inhibitors of coagulation, thus significantly increasing the chances of formation of thrombi in the venous vessels of the lower limbs the DVT, which is considered a serious event and can lead to death, once the thrombus detaches and reaches the pulmonary vessels, causes pulmonary embolism [10].

As for smoking, all participants reported that it was not, which is in line with a study [11], that evaluated the prevalence of smoking in a nursing school in southern Brazil, and showed that 59 participating teachers also had a zero smoking rate, relating to the education of this population that provides knowledge regarding the harmful effects of cigarette smoking, as well as the laws on smoking restriction and the demands of professional and social life as factors for not performing this practice.

However, 72.73% use alcoholic beverages socially, demonstrating a high and worrying result, because according to the World Health Organization (WHO), about 40% of the world population ingests alcohol or has already consumed it at some point in their lives, representing 3.3 million deaths each year caused by alcoholism, one in every 20 deaths, mostly male, and 19% by cardiovascular events [12].

Alcohol consumption has a direct impact on the cardiovascular system, and affects the mechanisms that control blood pressure, especially arterial pressure, and consumption commonly offers the risk of peak hypertension or even the development of hypertension in the long term associated with other risk factors. Some studies show that it can also cause cardiac arrhythmias, but with a hypothesis that alcohol alters the myocardial electrophysiological system. Thus, the use of alcohol associated with other cardiovascular risk factors increases the chances of a cardiovascular event [13].

In the evaluation of the participants' diet, it was shown that most of them consume red and white meat, refreshments, fried food, and fruits and vegetables weekly, and do not consume canned food. Thus, it is evident that they have an inadequate diet, because it is poor in fiber and rich in lipids and sodium.

This result is contrary to the study [14], conducted at the School of Nursing of the Federal University of Minas Gerais (UFMG), with 30 teachers, and demonstrated that the feeding of teachers in high frequency is adequate in terms of daily fiber intake, low use of soft drinks, and consumption of lean proteins. However, this same study showed that 50% of the teachers were overweight, and related to the sedentary lifestyle presented by the majority.

Studies show that daily intake of fruits and vegetables offers benefits to the cardiovascular system, since the fibers cause slow release of glucose into the bloodstream, reducing post-prandial blood glucose, avoiding hyperinsulinemia and reducing the risk of resistance to insulin action, and also have repercussions on the reduction of serum cholesterol levels due to its characteristic of giving luminal viscosity. Thus, the ingestion of soluble and non-soluble fibers daily will influence the prevention of metabolic syndrome, which is a high-risk condition for cardiovascular events [15].

As for the practice of some physical activity, most of them perform between weight training, running and walking, and it was shown that three participants do not practice any type of physical activity, being sedentary. In a survey conducted with 40 health teachers from a private HEI in Minas Gerais, which showed that on average 70% practice some type of physical activity, and 30% are sedentary [16].

The practice of physical activity regularly provides several benefits, among them, reduction of stress, reduction of blood pressure, total cholesterol and blood glucose, thus favoring the health of the cardiovascular system. Insufficient physical activity or nonpractice, on the other hand, is a factor for obesity and visceral fat, which in turn may lead to the development of metabolic syndrome and consequently some cardiovascular event [17].

According to Santana [5], cardiovascular risk factors related to the teaching profession occur mainly due to inadequate diet, physical inactivity and lack of leisure, justified by the excessive workload, which extends until outside working hours, all for the purpose of achieving or maintaining the quality indicators of the courses in which it is taught and enrichment of the curriculum. However, in this same study, it was evidenced that the teachers who had higher performance in the scientific production and higher number of students in conclusion works, presented more cardiovascular occurrences such as coronary ischemia, and strokes, both ischemic and hemorrhagic.

The teaching profession was related to the presence of cardiovascular risk factors, because it was found that the extensive workload, associated with the daily activities of the teacher, provide for an inadequate diet and lack of physical activity, which consequently these factors associated with other risk factors already present, only enhance the chances of developing a cardiovascular event, such as: changes in the levels of LDL, family history of hypertension and DM, consumption of alcoholic beverages and use of some medication, which in this study was the use of contraceptives.

## **5. CONCLUSION**

It was possible in this study to achieve the proposed objective and to highlight the cardiovascular risk factors presented by nursing professors from a private HEI. It was found that the age group is predominantly young adults, with experience in teaching, and with extensive workload, mostly married and with children, which indicates double or triple workday.

They have a family history of hypertension and DM, with high prevalence. Most women, too, use oral contraceptives, a potential risk for cardiovascular events. It was also evidenced that the diet of these teachers is inadequate, poor in fibers and rich in lipids and sodium, and that at some point, they have already presented changes in HDL levels.

It is concluded that the teaching profession, due to extensive workload and stressful activities, offers a risk for inadequate nutrition, sedentary lifestyle, and lack of time for leisure. These factors are associated with other existing factors, which may increase the chances of cardiovascular diseases in these professionals.

It is noteworthy in this research that the assessment of risk factors for cardiovascular diseases in this population brings scientific evidence in order to promote data for the development of strategies for health promotion in order to minimize these cardiovascular risk factors evidenced, providing quality of life for teachers and reducing morbidity and mortality from cardiovascular causes.

## CONSENT (WHERE EVER APPLICABLE)

The participants signed two copies of the free and informed consent form at the time they agreed to participate in the study. By the declaration of authorization of the research on site.

## ETHICAL APPROVAL

Resolution 466/12 was respected, which establishes criteria for research involving human beings, based on its principles, so data collection began after the approval of the ethics and research committee (cep) of the metropolitan university center of the amazon unifamaz, with the opinion number: 3,262,724.

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