



## Cardiovascular Risk Factors in University Students

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### Abstract

Cardiovascular diseases encompass a series of disorders that damage the heart. These problems include various pathologies, including coronary heart disease, heart failure, arrhythmias, valvular heart disease, and high blood pressure, among others. The objective of this work was to identify and describe the most frequently reported cardiovascular risk factors in the university population, such as age, sex, hygienic-dietary habits, stress, and social environment, in order to guide health prevention actions. A retrospective-observational analysis was carried out through a bibliographic review in search of articles published in Scielo, PubMed, Ebsco, and Google Scholar. keywords such as cardiovascular risk, risk factors, and university students were used, combined with the AND and OR operators to identify the most frequent cardiovascular risk factors in university students. This work concludes that the high prevalence of cardiovascular diseases is a serious public health problem in the student population, highlighting the importance of implementing health promotion programs within universities that promote healthy lifestyle habits aimed at reducing risk factors.

**Keywords:** Cardiovascular Risk; Risk Factors; University Students

### Abbreviation

CVD: Cardiovascular Diseases

### Introduction

Cardiovascular diseases (CVD) is a broad term that represents one of the main causes of death globally, constituting a public health problem, since many of the factors that contribute to the development of these diseases are caused by lifestyles such as an inadequate diet, tobacco use, alcohol consumption and a sedentary lifestyle, which increase the risk of these diseases. There are few studies that compare cardiovascular risk factors in college students, however, internationally a high prevalence has been reported in areas of social sciences and health sciences compared to others. Young college students are considered an extremely important population to look over for health interventions, not only because of their accessibility, but also because they represent a group that is at an important stage for the formation of healthy habits. Therefore, it is essential to have a detailed diagnosis of cardiovascular health in this population, in order to identify specific risk factors and thereby design health prevention actions.

### Methodology

To carry out this review, a literature search was conducted in PubMed, Google Scholar, Scielo, and EBSCO databases. The search focused primarily on studies investigating cardiovascular risk factors in college students, although due to the scarcity of information, it was complemented with studies in young patients. The selected studies had to meet inclusion criteria: they had to be peer-reviewed studies, be in English or Spanish, and focus on the university population. Studies with small samples, those that did not provide clear quantitative data, or those that did not meet clear methodological standards were excluded.

### Development

Heart disease is the leading cause of morbidity and mortality worldwide. It is estimated that CVD is responsible for approximately 17.9 million deaths per year. CVD not only represents a major public health challenge due to its high mortality rate, but also because it requires costly and prolonged treatment, covering a wide variety of heart disorders such as stroke, coronary heart disease and rheumatic heart [1].

In Mexico, the prevalence of risk factors for CVD among the adult population between 20 and 69 years is high. It is estimated that more than 17 million people are hypertensive and more than 14 million have dyslipidemia. In addition, there is a high prevalence of diabetics with more than 6 million diagnosed cases. The problem of overweight and obesity is even more worrying in the

country, with more than 35 million people overweight or obese, in addition to the fact that more than 15 million people in this age group have varying degrees of smoking [2]. Table 1 shows an increase in deaths per year between 1990 and 2013 due to CVD both in general and due to specific causes. Therefore, at a global level, these are currently considered the main cause of morbidity and mortality.

Disease	Deaths in 1990	Deaths in 2013	Increase from 1990 to 2013 (%)
Ischemic heart disease	5,737,483	8,139,852	41.7
Ischemic stroke	2,182,865	3,272,924	50.2
Hemorrhagic stroke	2,401,931	3,173,951	30.7
Hypertensive heart disease	622,148	1,068,585	74.1
cardiomyopathy and myocarditis	293,896	443,297	51.4
Rheumatic heart disease	337,493	274,054	-26.5
Aortic aneurysm	99,644	151,493	52.1
Atrial fibrillation and flutter	28,916	112,209	288.1
Endocarditis	45,053	65,036	46.3
Peripheral Vascular Disease	15,875	40,492	155.3
Other cardiovascular and circulatory diseases	478,261	554,588	15.2
Total	12,279,565	17,297,480	40.8

**Table 1:** Number of deaths per year between 1990 and 2013 due to CVD [3].

According to INEGI, in 2023, heart diseases stood out as the main cause of death in Mexico, registering around 198,481 deaths during the same year, affecting 51,184 men and 45,995 women [4].

A risk factor refers to any characteristic, condition or exposure that increases the likelihood of developing a disease. This definition applies to risk factors for cardiovascular diseases, which are mainly divided into modifiable and non-modifiable; among the most common modifiable factors are obesity, dyslipidemia, high blood pressure, diabetes, lack of physical activity and tobacco consumption, “representing 90% of the risk attributable to the population for men and 94% for women, with similar estimates in most of the world” [5]. And the second group includes age, sex and family history.

When the immune system is mixed with certain metabolic factors, it can ease the formation of atherosclerotic lesions. Although the exact origin that triggers atherosclerosis is not known with certainty, several conditions have been associated with it, such as diabetes, hypercholesterolemia, high blood pressure and smoking, which can cause damage to the walls of blood vessels. These, together with the genetic load, become an important risk for the development of atherosclerosis, which today are traditionally known as cardiovascular risk factors [3].

Tobacco use is a leading cause of heart disease and is associated with approximately one in four deaths from these conditions.

Smoking can lead to increased triglycerides, decreased HDL, increased susceptibility to blood clots, and cause thickening and narrowing of blood vessels [6]. A Brazilian study identified tobacco use among 6% of students [7], while a Mexican study reports a 24.5% prevalence of tobacco use among students [8]. Nearly half of students reported drinking socially. A study carried out at the same Brazilian university indicates that 90% of participants reported having already consumed alcohol, while 20.6% were classified as having risky alcohol consumption [9].

Findings from another study conducted in Turkey, regarding smoking, report that for men and women, 31.6-18.4% respectively, of the subjects were active smokers, while 4.1-0.9% had quit smoking. Smoking status was assessed according to gender and BMI categories, with a significant correlation between them. Among male and female smokers, 83.4-87.8% smoked one pack of cigarettes or less in a day, while 17.6-12.2% smoked more than one pack. Güneş, *et al.* (2019) regarding diet, explains the fat consumption routines for men and women, determining that 22.2-12.4% of the subjects used butter, 15.7-9.6% margarine, 53.2-63% olive oil, 33.4-34.1% sunflower/corn oil, and 3.9-4.8% hazelnut oil [10].

Family history is a very important cardiovascular risk factor because lifestyle habits are often similar among members of the same family, in addition to a certain predisposition to suffer from certain diseases that increase the risk of CVD such as hypertension, hypercholesterolemia and diabetes [11].

Duarte-Clíments., *et al.* (2021) [12] describe in a study carried out with young college students that the most prevalent cardiovascular risk factor was family history itself; however, the perceived risk caused by family history is not enough to promote changes in health-related behaviors. The second most frequent risk factor was a sedentary lifestyle. "When a person becomes sedentary, they accumulate cardiovascular disease in the form of generalized atherosclerosis, that is, not only at the level of the coronary arteries but also at the level of the arterial vessels throughout the body" [13]. In this way, we can say that a sedentary lifestyle has been associated with worse cardiovascular health indicators, such as BMI, waist circumference, body fat percentage, diet, blood markers (lipoproteins, glucose, lipid profile and insulin) and blood pressure.

The American College of Cardiology (ACC) and the American Heart Association (AHA) highlight that age is a key cardiovascular risk factor when assessing the likelihood of developing atherosclerotic cardiovascular disease. This makes sense, since most heart attacks and strokes occur in older adults but recent research has shown that younger population are increasingly at risk [14].

## Conclusion

Cardiovascular diseases remain the leading cause of mortality globally, accounting for more than 30% of all deaths. In Mexico, the situation is equally worrying, with millions of people affected by risk factors such as hypertension, obesity, and smoking. Statistics show that we urgently need effective interventions in the student population [15].

The study by Güneş., *et al.* (2019) [10] explains that for men and women, 31.6-18.4% of the subjects were active smokers, while 4.1-0.9% had quit smoking, on the other hand, Lacerda., *et al.* (2022) [9] mentions in their study that tobacco consumption in Brazil is between 6% and in Mexico consumption is found with a prevalence of 24.5% among students, showing us trends in smoking and alcohol consumption among young people as a risk factor, suggesting that these risk behaviors are common in various cultures.

Similarly, if we extrapolate this with the incidence data in our country, in Mexico there is a significant prevalence of risk factors for cardiovascular diseases, which indicates an urgent need for intervention, aimed mainly at reducing modifiable risk factors, such as diet, smoking, sedentary lifestyle and obesity.

When analyzing the relationship between the data in this review, it was observed a high prevalence of factors that support us in seeing the need to address cardiovascular risk factors in college students in a comprehensive manner, since lifestyle changes during the university stage seem to contribute to an increase in the prevalence of risk behaviors, such as poor diet, sedentary lifestyle, and social behaviors [3].

The high prevalence of this type of disease in young people represents a serious health problem in our student population, since a prevalence of 24.5% was identified in Mexico, adding that more than half of the students reported drinking socially, which tells us how the environment in which they develop influences modifiable risk factors. On the other hand, non-modifiable risk factors are also of utmost importance, especially in this review, age, which is an important factor to consider because most cardiovascular diseases occur in older adults. However, in recent years an increase in the incidence of CVD has been observed in the young population. Compared with previous studies in similar populations, the findings coincide with the global trend of an increase in cardiovascular risk factors in young people.

These observations highlight the importance of implementing health promotion programs within universities, which promote healthy lifestyle habits aimed at reducing risk factors and thus preventing chronic diseases from an early age.

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## Conflict of Interest

Declare if any financial interest or any conflict of interest exists.

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