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CARDIOVASCULAR RISK FACTORS AT THE POPULAR UNIVERSITY OF CHONTALPA: PREVALENCE AND PREVENTION STRATEGIES

FACTORES DE RIESGO CARDIOVASCULAR EN LA UNIVERSIDAD POPULAR DE LA CHONTALPA: PREVALENCIA Y ESTRATEGIAS DE PREVENCIÓN

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Cardiovascular Risk Factors at the Popular University of Chontalpa: Prevalence and Prevention Strategies

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ABSTRACT

Introduction: A cardiovascular risk factor (CVRF) is a biological characteristic or lifestyle that increases the probability of suffering or dying from a cardiovascular disease (CVD) in those individuals who present it. O**ur objective** is to determine the cardiovascular risk factors in the university community of the Popular University of Chontalpa. **Methods**: Descriptive cross-sectional study of a non-probabilistic sample of 166 people. Each participant signed the informed consent and answered a semi-structured survey, which included personal and family pathological history, anthropometric measurements, etc. We also took blood pressure and collected a blood sample for blood chemistry analysis. **Results**: 59% of the sample was female and 41% male, between 18 and 64 years old. According to the ICC, 32.5% of the population studied has a very high risk, and 21% has a high risk. 62% have a family history. 32.15% were considered to have adequate nutrition; 45.2% consume alcoholic beverages, and 23.8% smoke. 31.91% had hyperglycemia, 38.61% had high triglycerides, and 12.8% had high cholesterol. Only 3.06% exhibited a high risk for HDL-c and 5.10% for LDL-c. **Conclusions**: The most relevant modifiable CVRFs in the UPCH are age, sex, triglycerides, physical activity, and diet. Develop strategies for reducing these, such as responsible self-care, which translates into a healthy diet and regular physical exercise.

Keywords: risk factors, university community, obesity, overweight, cardiovascular

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Factores de Riesgo Cardiovascular en la Universidad Popular de la Chontalpa: Prevalencia y Estrategias de Prevención

RESUMEN

Introducción: Un factor de riesgo cardiovascular (FRCV) es una característica biológica o estilo de vida que incrementa la probabilidad de padecer o morir por una enfermedad cardiovascular (CVE) en aquellos individuos que la presentan. El **objetivo** es determinar los factores de riesgo cardiovascular en la comunidad universitaria de la Universidad Popular de la Chontalpa**. Métodos:** Estudio descriptivo transversal de una muestra no probabilística de 166 personas. Cada participante firmó el consentimiento informado y respondió una encuesta semiestructurada. También se tomó la presión arterial y una muestra de sangre para análisis de química sanguínea. **Resultados:** El 59% de la muestra fue femenina y el 41 % masculina, entre 18 y 64 años. Según el ICC, el 32,5 % de la población estudiada tiene riesgo muy alto, y el 21% riesgo alto. El 62% tiene antecedentes familiares. El 32,15% se consideró con una nutrición adecuada; El 45,2% consume bebidas alcohólicas y el 23,8% fuma. El 31,91% presentó hiperglucemia, el 38,61% triglicéridos elevados y el 12,8% colesterol elevado. Sólo el 3,06% presentó riesgo alto de HDL-c y el 5,10% de c-LDL. **Conclusiones:** Los FRCV modificables más relevantes en la UPCH son edad, sexo, triglicéridos, actividad física y dieta. Desarrollar estrategias para su reducción en la UPCH, como el autocuidado responsable, que se traduzca en una dieta saludable y ejercicio físico regular.

***Palabras clave*:** factores de riesgo, comunidad universitaria, obesidad, sobrepeso, cardiovascular

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Fatores de Risco Cardiovascular na Universidade Popular de Chontalpa: Prevalência e Estratégias de Prevenção

RESUMO.

Introdução e Objetivo: Fatores de Risco Cardiovascular (FRCV) é uma característica biológica ou estilo de vida que aumenta a probabilidade de sofrer ou perecer por DCV nos indivíduos que a apresentam. **Neste estudo, o nosso objetivo** é determinar os fatores de risco cardiovascular na comunidade universitária da Universidade Popular de Chontalpa. **Métodos:** Estudo transversal descritivo com uma amostra não probabilística de 166 pessoas. Cada participante assinou o consentimento informado e respondeu a um inquérito semiestruturado, que incluía antecedentes patológicos, pessoais e familiares, medidas antropométricas, etc. **Resultados:** 59% da amostra era do sexo feminino e 41% do sexo masculino, com idades compreendidas entre os 18 e os 64 anos. Segundo o CCI, 32,5% da população estudada apresenta um risco muito elevado e 21% um risco elevado. 62% têm antecedentes familiares. 32,15% foram considerados com alimentação adequada; 45,2% consomem bebidas alcoólicas e 23,8% fumam. 31,91% apresentavam hiperglicemia, 38,61% apresentavam triglicéridos elevados e 12,8% apresentavam colesterol elevado. Apenas 3,06% apresentaram risco elevado para HDL-c e 5,10% para LDL-c. **Conclusão:** Os FRCV modificáveis mais relevantes no UPCH são a idade, o sexo, os triglicéridos, a atividade física e a dieta. Estes dados reforçam a importância da desenvolver estratégias deprevencão na UPCH, como o autocuidado responsável, que se traduz numa alimentação saudável e, na prática, regular de exercício físico.

***Palavras-chave**:* fatores de risco, comunidade universitária, obesidade, sobrepeso, cardiovascular

INTRODUCTION

The World Health Organization (WHO) defines cardiovascular diseases as a collection of conditions affecting the heart and blood vessels (Suárez & Astoviza, 2010). Heart failure, heart disease, rheumatic illness, congenital heart disease, peripheral vascular disease, high blood pressure, coronary heart disease, cerebrovascular disease, and cardiomyopathies are a few of these. Cerebrovascular disease (CVD) and ischemic heart disease cause the majority of deaths (Pérez et al., 2021; Vaamonde & Álvarez-Món, 2020).

A cardiovascular risk factor (CVRF) is a biological characteristic, habit, or lifestyle that increases the likelihood of suffering or dying from cardiovascular disease (Lobos Bejarano & Brotons Cuixart, 2011). Most CVD can be avoided by reducing exposure to behavioral risk factors such as poor eating habits, lack of exercise, smoking, and excessive alcohol consumption (Rouberte et al., 2022; Secretaría de Salud, 2022). In Mexico, nearly 220,000 people die each year from heart problems, of which at least 78% correspond to heart attacks or ischemic heart disease. Therefore, controlling factors such as smoking, overweight, high blood pressure, high cholesterol, and diabetes can prevent this scenario. Risk factors can be non-modifiable, such as age, sex, and genetic factors/family history, and modifiable, such as high blood pressure (HBP), smoking, dyslipidemia, diabetes mellitus (DM), overweight, and abdominal or visceral obesity. These factors often correlate with physical inactivity and stress (Aguero & Esquivel, 2022).

Some research conducted in university communities revealed that young people who exhibit lifestyle changes due to family independence or temporary changes of residence favor the increase or prevalence of an apparently healthy life (Alcívar Alcívar et al., 2020). Experts attribute this to weak connections between the group and support networks, such as the family, as well as the unique circumstances of entering a new educational system. This stage is significant for the development of eating habits since the limited time and diverse activities lead them to eat between meals, consume more fast food, and skip meals frequently. Additionally, the decline in physical activities, the rise in passive entertainment, and the increasing prevalence of tobacco and alcohol consumption are all contributing factors to this trend. All this contributes directly to the development of CVRF in the university community(Salazar-Rendón et al., 2018).

It should be noted that in the Chontalpa subregion, little research has been carried out to assess this condition in young university students, so there is a high level of interest in nutritional and cardiovascular prevention. Therefore, the present work aims to understand the various risk factors associated with cardiovascular diseases in a group of workers and university students, comparing various aspects to discover the connection between them. By figuring out the risk factors linked to these diseases, it is also possible to take socially beneficial steps to improve the effectiveness of CVRF prevention measures.

METHODOLOGY

A descriptive, cross-sectional, non-probabilistic study was conducted in the UPCH university community from November to December 2022. A sample of 166 participants was included, who gave informed consent and completed a semi-structured questionnaire. The survey included anthropogenic parameters and blood pressure measurements. Weight, height, waist, hip, and blood pressure measurements were taken with a scale with a radiometer and stadiometer. To measure weight and height, a tape measure was used for waist and hip circumferences, and a Check AT manometer for resting blood pressure. Body Mass Index (BMI), ranges were classified according to WHO (Gutiérrez Tolentino et al., 2024) and Waist-Hip Ratio (WHR) according to Rouberte (Rouberte et al., 2022).

For risks, sex was considered: in women, low <0.71, moderate 0.71-0.77, high 0.78-0.82, and very high >0.82; and for men, low < 0.83, moderate 0.83-0.88, high 0.89-0.94, and very high > 0.94. The systolic and diastolic blood pressure ranges were obtained from NOM-030-SSA2-2009(Federación, 2009).

For the analysis of glucose and lipid profile, 100 microliters of serum were taken and processed according to the supplier's instructions (Pointe Scientific Liquid Reagents). For high-density cholesterol (HDL-c), phosphotungstate/Mg++ from Valtek Diagnostics was used. The reference values for glucose are low (< 70 mg/dL), normal (70-105 mg/dL) and high (> 105 mg/dL). Cholesterol: Normal (< 240 mg/dL) and High (> 240 mg/dL). Triglycerides: low (< 44 mg/dL), normal (44-148 mg/dL) and high (> 148 mg/dL). HDL cholesterol: three ranges were used for both sexes: for women, low risk (> 65 mg/dL), medium risk (45-65 mg/dL) and high risk (< 45 mg/dL); and for men, low risk (> 55 mg/dL), medium risk (35-65 mg/dL) and high risk (< 35 mg/dL). LDL cholesterol: two ranges were used: low risk (< 130 mg/dL) and high risk (> 130 mg/dL).

Finally, we propose cardiovascular risk prevention strategies that can be implemented both at UPCH and at other universities in the region.

Statistical analysis

A database was built using IBM SPSS Statistics 25 for statistical analysis. Cross-tabulations were performed, and Pearson's Chi-square test was applied to evaluate the relationships between qualitative variables. A significance level of $p < 0.05$ was used to determine whether the factors were dependent or independent.

Ethical considerations

This study complied with the provisions of the Declaration of Helsinki and the General Health Law on research. We will protect the confidentiality of the information through informed consent. We also followed the regulations for conducting research projects in human health and the General Law on the Protection of Personal Data Held by Obligated Subjects.

RESULTS

The study included a sample of 166 people to determine the prevalence of CVRF. 59% of the sample was female and 41% was male. The age range was 18 to 64 years, with an average of 25.11 years (Figure 1).

A family history of cardiovascular disease was associated with 62% of the non-modifiable risk factors (Figure 2). These factors are crucial in determining the risk of developing coronary artery disease.

Regarding diet as CVRF, Table 1 shows that only 32.5% consume fruits and vegetables daily. 69.3% consume carbohydrates daily, 30.7% consume saturated fats daily, 5.4% and 19.9% consume fats after daily consumption.

The results shown in Table 2 show that, according to the habits of the university population, 54.8% have not consumed alcoholic beverages, compared to 28.3% once a month, while 1.2% consume alcohol daily. Conversely, when it comes to tobacco consumption, 1.2% of the university population smokes 2 to 4 times a month, 8.4% smoke once a month, and only 7.8% smoke daily. Regarding physical activity, 6.6% do not exercise, 30.1% do it 2 to 3 times a week, and only 29.5% exercise daily.

On the other hand, the results of BMI indicated an average of 26.89 ± 5.90 and a range of 16.62 to 42.87 (Table 3). There is a 58.4% chance of getting heart disease, with 26.50% being overweight, 15.70%

having grade I obesity, 10% having grade II obesity, 1.81% having grade III obesity, and 4.22% being underweight. The remaining 41.60% are within normal ranges (chi-square = 34.35, p = 0.02). In our study, although BMI and sex are independent, the female sex has the highest percentage of overweight and obesity. When evaluating anthropometric characteristics, the results show that weight and height have significant statistical differences between the female and male populations (Table 3, $p < 0.05$; one-way ANOVA).

According WHR results, Table 4 presents the percentage of risk for overweight and obesity regardless of sex (chi-square = 4.10, p = 0.53). The WHR results (Figure 3) show that the mean for the UPCH population was 0.82, with a standard deviation of 0.07 and a range of 0.67 to 1.12. 32.5% of the population is at very high risk, 21.1% is at high risk, 27.1% is at moderate risk, and only 19.3% is at low risk of CVD.

The risks depend on sex: for women, low risk is waist-hip ratio < 0.71, moderate risk is 0.71-0.77, high risk is 0.78-0.82, and very high risk is > 0.82; and for men, low risk is < 0.83, moderate risk is 0.83-0.88, high risk is 0.89-0.94, and very high risk is > 0.94. The Chi-Square value for CVD and age is 24.11 (p = 0.02) for age and 39.01 (p = 0.00) for sex (Table 5). This means that most people between the ages of 18 and 26 have high to moderate risks of getting CVD. The lipid profile includes total cholesterol, HDL cholesterol, LDL cholesterol, and triglycerides (Simonen et al., 2023). Table 5 displays the sample distribution based on blood pressure levels and five-element blood chemistry assays. Total cholesterol values are normal and high, with an average of 164.57±133.17. The values range from 12.9% in the high range to 87.1% in the normal range. The triglyceride values range from high at 38.6%, normal at 57.4%, and low at 4.0%, resulting in an average of 152.41 to 112.45. The results of serum glucose showed that 31.9% of the population had high serum levels, compared with 48.9% and 19.1% of the population with normal and low values, respectively. We classified participants as low-risk and high-risk in relation to LDL-c. The most frequent range was low risk, with 94.9%. High risk was present in 5.1% of the sample. Most people are at low risk, so their LDL levels are adequate, that is, less than 100 mg/dL.

Regarding HDL-c ranges in the UPCH population, the high-risk range was present in only 3.1%, and the medium risk was 1.0%, with an average of 138.50 ± 95.71. With the above results, Figure 4 shows

the number of CVRFs and their percentage. The analyzed population with at least 3 CVRFs (25.47%) exhibited the highest frequency, followed by those with two and five factors.

DISCUSSION

The main finding of the present study is the prevalence of at least one CVD factor in 99% of the UPCH university community. 62% of non-modifiable factors were associated with a hereditary family history of CVD. Family history should be considered in primary care for its treatment and to improve health strategies, such as modifying habits and lifestyles (Luugo, 2021; Yusuf et al., 2020). According to Campos et al.(Campos-Nonato et al., 2023) epigenetic factors, advanced age, physical inactivity, maternal weight gain, and the food environment favor the presence of obesity, increasing aspects such as high blood pressure and cholesterol levels.

From the nutritional aspect, insufficient consumption of fruits and vegetables in the diet was observed, which increases the risk of CVD by 31%. Dietary guidelines recommend increasing the consumption of fruits and vegetables without exceeding more than five servings per day (Suárez & Astoviza, 2010). A direct relationship has been reported between a high intake of carbohydrates and trans fats and an increased risk of mortality and CVD (Yusuf et al., 2020). Foods rich in trans fats are important as CVRF since they increase serum levels of low-density lipoproteins (LDL) and reduce those of HDL, which contributes to the prevalence of obesity (Simonen et al., 2023). For example, high consumption of foods: meats, egg yolks, dairy products, and ultra-processed foods (rich in fat) increases the risk of CVD (Kotchen & Kotchen, 2002; Sampson et al., 2012).

The relationship of smoking with CVD is widely demonstrated, since smoking influences and negatively modifies lipoproteins (Fernando & Pamela, 2012; Tribin et al., 2020). In addition, it alters the balance between oxygen supply and demand, which leads to atherosclerosis, affecting the cardiovascular system through endothelial dysfunction and oxidative changes (Davia-Cantos et al., 2022). In this study, 7.8% smoke daily, increasing the development of CVD in this population. Likewise, by associating triglyceride levels with smoking, there is a high probability of blood clot formation, as well as decreased HDL levels in the population analyzed.

Globally, the National Heart, Lung, and Blood Institute says that during CVD, cell damage can coat blood vessels, cause plaque to build up in blood vessels, and cause them to narrow (Reyes Caorsi, 2020). The development of CVD and stroke correlates closely with these data.

Other research indicates a relationship between alcohol consumption and CVD, influenced not only by the amount but by drinking patterns (Hoek et al., 2022; Reyes Caorsi, 2020). The results in UPCH university students align with national data from the SSA, where 66% of Mexicans are abstainers or moderate drinkers, while 27% consume alcohol excessively. Adolescents, particularly university students, are the highest consumers, highlighting the need to strengthen psychoeducational interventions (Silva et al., 2021).. Pino et al. (Pedro & Daniel, 2021) suggest that behavioral factors are key; however, genetic and biological factors increase the CVD mortality rate

A sedentary lifestyle, on the other hand, is a CVRF and a metabolic factor that accentuates the effects of other risk factors such as obesity, hypertension, or cholesterol (Attilio, 2012; Hoek et al., 2022; Rivera-Rivera et al., 2021). The UPCH university community shows a high prevalence of sedentary lifestyle, a factor associated with coronary heart disease. Therefore, reducing the time spent on low-impact activities, such as spending a lot of time sitting, along with a healthy diet, should be an essential recommendation for the UPCH population. In addition, sedentary lifestyle Obesity has been associated with 23% of ischemic heart disease (Bentham et al., 2017; Vaamonde & Álvarez-Món, 2020). Hidalgo et al. (2012) found a correlation between anthropometric measurements and parameters such as total cholesterol, HDL, LDL, triglycerides and arterial hypertension (Alcívar Alcívar et al., 2020).The results indicate that male students are at greater risk, since the population analyzed presented more overweight and obese students in grades II and III due to their unhealthy diet. These findings align with data from the Autonomous University of Mexico (UNAM) (Pedro & Daniel, 2021).

Tabasco ranks fourth in overweight and obesity, which leads to an increase in patients with CVD (Shamah-Levy T, Romero-Martínez M, Barrientos-Gutiérrez T, 2022). In the UPCH, despite the lack of a relationship between BMI and gender, women are overweight and men are obese. Women are more prone due to the sum of genetic, hormonal, and metabolic factor (Pizzi & Fung, 2015). Regarding WHR, our study reports a high prevalence, demonstrating a strong association between waist circumference and abdominal fat, to the increase in multiple health problems (Hernández et al., 2020). Making it a

crucial anthropometric indicator to predict arterial hypertension and CVD in overweight and obese adolescents. Darbandi et al. (Darbandi et al., 2020) found that, as age increases, both BMI and HWR increase, and the probability of CVD decreases from high to moderate. Karvonen and Kin (2012) suggest that women aged 45 to 55 years have a higher risk of developing CVD. Showing that high levels of triglycerides and c-LDL with low levels of HDL-c worsen the cardiovascular risk profile. Additionally, presenting high levels of glucose in the blood is related to other metabolic risk factors, such as dyslipidemia, arterial hypertension, and overweight (Kim et al., 2010).

The results showed that 31.9% of the population had high levels of serum glucose, which can be associated with CVD in the UPCH. The combination of factors such as hypertension, dyslipidemia, obesity, or diabetes increases the risk of CVD (Aguero & Esquivel, 2022; Pérez et al., 2021). Likewise, the control of high to very high levels of hypertension (HT) in diabetic individuals reduces macrovascular and microvascular complications, as well as general mortality (Andamayo Flores et al., 2020). In the UPCH, 5.1% of the participants presented high levels of LDL cholesterol, thus highlighting that these levels combined with a low level of HDL cholesterol significantly increase the probability of major cardiovascular events and mortality. Thus, elevated LDL levels contribute to the development of atherosclerotic CVD (Simonen et al., 2023). It should be noted that epidemiologists identify LDL cholesterol as an independent predictor of cardiovascular risk (Pedro-Botet et al., 2020; Sampson et al., 2012). On the other hand, HDL cholesterol levels below 40 mg/dL are recognized as a significant risk factor for coronary heart disease (Wadhera et al., 2016). Therefore, in the UPCH population, cardiovascular risk appears to be determined by diet, physical activity, and family history. This coincides with what was reported by Rivas et al. in Paraguayan university students, whose most frequent CVRF combination was two risk factors, followed by three (Rivas Martínez et al., 2023).

Finally, at UPCH, evidence of multiple risk factors in the same individual is associated with a higher risk of developing CVD. Therefore, it is not the number of risk factors that matters, but the way in which they accumulate. Our study suggests that the combination of factors such as hypertension, congestive heart failure, BMI, dyslipidemia, glucose, physical activity and diet are key points to determine CVD prevention strategies in the UPCH community.

In this sense, the design of specific prevention strategies allows mitigating these factors, both in universities and in other higher education institutions in the region. This issue is relevant, given that universities play a crucial role in the formation of healthy habits. The implementation of effective prevention programs could significantly improve the health of students and academic staff. These interventions can be carried out both at individual and group level (Castellano et al., 2014).

The strategies can be divided into; educational interventions, lifestyle changes and health promotion initiatives focused on modifiable factors identified in the study and at other universities in Mexico and other countries.

Educational campaigns on CVRF: The goal of these campaigns is to increase public awareness about the associated risks and encourage healthy habits. They are carried out through letters, seminars, workshops, and social networks, with the aim of informing about inadequate nutrition, sedentary lifestyles, smoking, and excessive alcohol consumption (DGPS & SS, 2018; Menor Rodríguez et al., 2017).

Frequent educational talks with health professionals: The aim is to point out the dangers of substance use, the harmful effects of poor nutrition, and the importance of regular sports activities. Nutritionists, doctors, and public health experts organize these programs. By offering up-to-date and personalized information, these programs promote the adoption of healthy lifestyles (Menor Rodríguez et al., 2017; Morales I. et al., 2013; Rivera-Rivera et al., 2021).

Healthy eating programs: It is imperative to implement nutritional education programs that promote healthy eating habits, such as reducing saturated fat consumption and increasing water consumption to two liters per day, given that only 32% of participants have an adequate diet and 32% have hyperglycemia. The objective includes partnerships with university cafeterias and dining halls to offer healthy eating options and personalized nutritional support to students (Gamboa et al., 2023; Reyes et al., 2021).

Psychological and social support program: Since stress can be a CVRF, developing spaces for emotional and psychological support can be an important preventive strategy. Providing mindfulness sessions, reflection, or psychological support groups can help reduce the impact of stress, anxiety, and

depression on students (Castellano et al., 2014; Menor Rodríguez et al., 2017). In this particular instance, UPCH possesses a psychopedagogical care center that is insufficient for the student population.

Social integration and mutual support: Creating groups or clubs focused on health promotion, where students can support each other in adopting healthy habits and maintain a social support network that encourages positive behavior change.

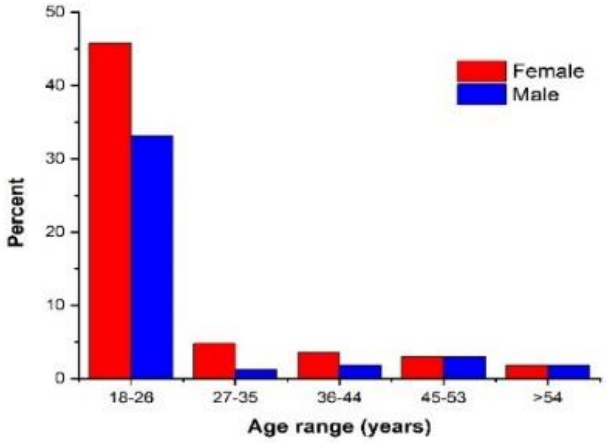
Policies for a healthy campus: with the objective of encouraging the student community to use spaces dedicated to health and well-being and healthy eating. For this, cafeterias would include a menu with salads, fresh fruit, and dishes with low sodium content.

Programs to help stop smoking and drinking alcohol: creation of support groups, counseling, or alternative therapies to reduce and promote responsible behaviors that impact the health of students. Health surveillance programs: conducting campaigns for exams such as monitoring and controlling blood pressure, cholesterol, triglycerides, and glucose levels.

All of the above described would lead to the expansion of the strategies to other higher education institutions. Since the CVRFs identified at UPCH are common in the university population in general, these strategies can be adapted to other universities in the region through: Interuniversity networks for health promotion. Collaboration with public health organizations to develop prevention policies. Incorporate cardiovascular health into the curricula of health-related courses. Therefore, these strategies are especially important given that universities have the responsibility of fostering a healthy environment for their community.

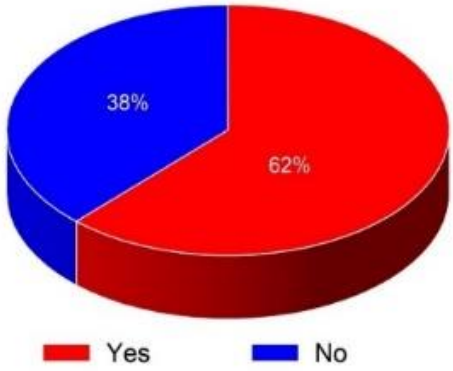
FIGURES AND TABLES

Figure 1. Distribution of the UPCH university community sample based on age and gender. Data presented as relative frequencies. Information was available for 166 participants and was obtained from the survey.



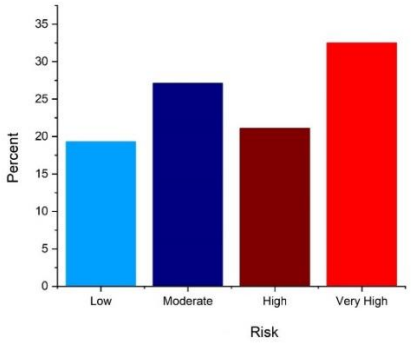
Data are presented as relative frequencies. Information was available for 166 participants and was obtained from the survey.

Figure 2. Distribution of the sampled population based on the relationship of family history of chronic degenerative diseases. Data are presented as relative frequencies. Information was available for 166 participants and was obtained from the survey.



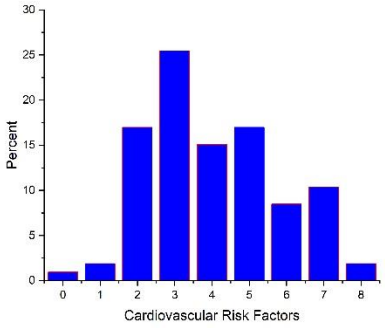
Data are presented as relative frequencies. Information was available for 166 participants and was obtained from the survey.

Figure 3. Distribution of waist-hip index values in the UPCH university community.



The risks depend on sex: for women, low risk is waist-hip ratio < 0.71, moderate risk is 0.71-0.77, high risk is 0.78-0.82, and very high risk is > 0.82; and for men, low risk is < 0.83, moderate risk is 0.83-0.88, high risk is 0.89-0.94, and very high risk is > 0.94.

Figure 4. Summary of cardiovascular risk factors.



The numbers on the x-axis mean the number of CVRF per patient.

The numbers on the x-axis mean the number of CVRF per patient.

Table 1. Distribution of the sample according to eating habits

Food group	Consumption frequency				
	Daily (%)	2-3 t/w (%)	1 t/m (%)	2-4 t/m (%)	Never (%)
Fruits and vegetables	32.50	52.40	12.00	1.80	1.20
Carbohydrates	69.30	27.70	-	1.80	1.20
Saturated fats	30.70	59.60	5.40	4.20	-
Trans fats	19.90	59.00	9.60	11.40	-

t/w: times/week, t/m: times/month

Table 2. Distribution of the UPCH sample according to toxic habits and physical exercises

Habits	Consumption frequency				
	Daily (%)	2-3 t/w (%)	1 t/m (%)	2-4 t/m (%)	Never (%)
Alcohol	1.20	5.40	28.30	10.20	54.80
Tobacco	7.80	5.40	8.40	1.20	77.10
Physical exercise	6.60	30.10	13.30	6.60	29.50

t/w: times/week, t/m: times/month

Table 3. Correlation BMI with age and sex

Classification based on BMI	Ages						Gender	
	18 a 26 (%)	27 a 35 (%)	36 a 44 (%)	45 a 53 (%)	> 54 (%)	Total (%)	Female (%)	Male (%)
Underweight	4.22	-	-	-	-	4.22	3.01	1.20
Normal	37.95	1.20	0.60	0.60	1.20	41.57	25.30	16.27
Overweight	19.28	2.41	2.41	1.20	1.20	26.51	17.47	9.04
Obesity I	9.04	1.20	0.60	3.61	1.20	15.66	7.83	7.83
Obesity II	7.23	1.20	1.20	0.60	-	10.24	4.82	5.42
Obesity III	1.20	-	0.60	-	-	1.81	0.60	1.20
Total	78.92	6.02	6.02	5.42	6.02	100.00	59.04	40.96
P	0.02						0.53	

Test: Chi square

Table 4. Risk correlation according to WHR with age and sex

Age ranges (years)	Risk classification according to WHR				P
	Low	Moderate	High	Very High	0.02
18 a 26	17.47	25.3	16.27	19.88	
27 a 35	0	1.2	1.2	3.61	
36 a 44	0.6	0	2.41	2.41	
45 a 53	0.6	0.6	0.6	4.22	
>54	0.6	0	0.6	2.41	
Gender					0.00
Female	3.01	14.46	15.06	26.51	
Male	16.27	12.65	6.02	6.02	

Test: Chi square

Table 5. Sample distribution according to blood pressure test and blood chemistry

Blood pressure	Systolic (%)	Diastolic (%)	
Optimal	66.28	68.68	
Normal	12.64	4.81	
Borderline	9.64	9.03	
Grade 1 Hypertension	7.23	13.25	
Grade 2 Hypertension	3.61	3.01	
Grade 3 Hypertension	0.6	1.2	
	Glucose	**Triglycerides**	**Total Cholesterol**
Low	19.15	3.96	-
Normal	48.94	57.43	87.13
High	31.91	38.61	12.87
	HDL-c	**LDL-c**	
Low risk	95.92	94.90	
Medium risk	1.02	-	
High risk	3.06	5.10	

CONCLUSION

In the UPCH university community, 99% of the sample presented at least 1 cardiovascular risk factor. Regarding the combination of CVRFs, most common combination was three factors per person, followed by five and seven CVRFs. Finally, estimates indicate that inadequate diet, family history, BMI, and physical inactivity have the highest prevalence of CVRFs. Therefore, it is appropriate to consider that unhealthy habits at this stage of life constitute a CVRF, which continues to be a public health problem in the university community. The results demonstrate necessitates increased focus on prevention and health promotion issues in the university environment.

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