High Prevalence of Classic Cardiovascular Risk Factors in a Population of University Students From South Central Chile

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Introduction and objectives. Cardiovascular disease is the principal cause of death worldwide. Such disease can be prevented by controlling cardiovascular risk factors.

Methods. The study involved 783 students aged between 18 and 26 years from the University of Talca (Region VII, Maule, Chile), which corresponds to 14.9% of all students. Their demographic characteristics, familial cardiovascular disease history, weight, height, arterial pressure, and waist diameter were recorded, and their lipid and blood glucose levels were measured.

Results. Overall, 12.8% of students had some degree of arterial hypertension, which was more severe in men than in women (*P*<.0001). In addition, 45.5% of the men and 24.3% of the women were overweight or obese. Some 39.8% of students admitted being smokers and 91.5% did not participate in any significant physical activity. Hypercholesterolemia (≥200 mg/dL) was present in 20.2% of students and around 1.0% had the metabolic syndrome.

Conclusions. The prevalence of the main cardiovascular risk factors was found to be high in the study population. It may be necessary to carry out regular publicity campaigns that focus on improving lifestyle to decrease the prevalence of cardiovascular risk factors in young people in whom morbidity and mortality is still low.

Key words: *Cardiovascular risk factors. Blood pressure. Cholesterol. Waist diameter. Glycemia. Metabolic syndrome.*

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Alta prevalencia de factores de riesgo cardiovascular clásicos en una población de estudiantes universitarios de la región centro-sur de Chile

Introducción y objetivos. Las enfermedades cardio-vasculares (ECV) son la primera causa de muerte en el mundo. Dichas enfermedades se pueden prevenir mediante el control de los factores de riesgo cardiovascular.

Métodos. Se estudió a 783 alumnos entre 18 a 26 años de edad de la Universidad de Talca (VII Región del Maule, Chile), lo que equivale al 14,9% del alumnado. Se registraron sus datos demográficos, los antecedentes familiares de enfermedad cardiovascular, el peso, la talla, la presión arterial y el diámetro de cintura, y se determinaron su perfil lipídico y su glucemia.

Resultados. El 12,8% de los alumnos presentó algún grado de hipertensión arterial, que fue mayor en varones que en mujeres (p < 0,0001). El 45,5% de los varones y el 24,3% de las mujeres presentaron sobrepeso u obesidad. El 39,8% de los estudiantes se reconoció fumador y el 91,5% no realizaba ninguna actividad física significativa. El 20,2% del alumnado presentó una colesterolemia de 200 mg/dl y alrededor del 1% de los alumnos presentó síndrome metabólico.

Conclusiones. En la población estudiada se encontró una alta prevalencia de los principales factores de riesgo cardiovascular. Parece necesario establecer campañas focalizadas y periódicas que tengan como objetivo mejorar los estilos de vida (disminuir la prevalencia de factores de riesgo cardiovascular) en jóvenes que aún no expresan morbimortalidad.

Palabras clave: *Factores de riesgo cardiovascular. Presión arterial. Colesterol. Perímetro abdominal. Glucemia. Síndrome metabólico.*

INTRODUCTION

According to the World Health Organization (WHO), cardiovascular disease (CVD) causes around 30% of all deaths worldwide,[1] with a similar situation in Chile.[2,3]

ABBREVIATIONS

DM: diabetes mellitus.
CVD: cardiovascular disease.
CVRF: cardiovascular risk factors.
BMI: body mass index.
WHO: World Health Organization.
HDL: high density lipoprotein.
LDL: low density lipoprotein.
NHS: National Health Survey.

Research into cardiovascular risk factors (CVRF) is one of the fields in epidemiology that is experiencing the greatest development. Various types of behavior have been identified that may contribute to the onset or reduction of CVD. The CVRF have been classified into the main factors and the emerging factors. The WHO considers the main, and modifiable CVRF to be smoking, a sedentary lifestyle, a diet poor in fiber and rich in cholesterol and saturated fats, diabetes mellitus (DM), dyslipidemias and hypertension.[4-6]

Most university students can be considered "healthy". However, some students may have the main CVRF though with no symptoms. Given that many CVRF are modifiable, it is necessary to determine their prevalence and, if the results warrant, to carry out prevention programs aimed at reducing their frequency. The aim of this study was to examine the prevalence of some of the main CVRF in a population of university students from south central Chile.

METHODS

We undertook a cross-sectional study of a random selection of undergraduate students studying 19 different degree courses at the University of Talca (Talca, VII Region of Maule, Chile). The study included 783 students aged 18 to 26 years who enrolled in April 2004, representing 14.9% of the student population. Two percent of the students invited to participate in the study failed to respond to the invitation. All the participants signed an informed consent validated by the University Bioethics Committee. The data (surveys, measurements, sample taking, and processing) were collected between April and June 2004.

Instrument

An administered questionnaire was prepared with closed questions based on other questionnaires for the main CVRF,[7-9] which included:

1. Demographic data: age, sex, marital status, place of origin.
2. History:
– Family: parents and grandparents: hypertension, DM, smoking, obesity, and acute myocardial infarction.
– Personal: questions were asked about smoking and physical exercise (simple, non-detailed survey).
3. Measurements: measurements of weight, height, blood pressure, and waist circumference were undertaken in standardized conditions.[10,11] To minimize the inter-observer variability and watch for the precision and exactness of the measurements, these were periodically supervised by the Director of Student Health Services. Anthropometric measurements were made with a periodically calibrated balance and an anthropometer that had a precision of 1 mm. The measurements were made without shoes and with the minimum clothing.

Definitions

International consensus agreements were used for the definitions:

1. Blood pressure. In accordance with the WHO/International Society of Hypertension and the Joint National Committee on Prevention for High Blood Pressure,[12-15] normal blood pressure (BP) was defined as a systolic BP (SBP) <130 mm Hg and diastolic BP (DBP) <85 mm Hg, high normal BP as SBP of 130-139 mm Hg and DBP of 85-89 mm Hg, grade 1 hypertension as SBP of 140-159 mm Hg or DBP of 90-99 mm Hg, and grade 2 hypertension as SBP ≥160 mm Hg or DBP ≥100 mm Hg. The BP was measured with a mercury manometer with the student seated and after resting for 5 min.[16-18] If the SBP was >129 mm Hg or the DBP >84 mm Hg, the measurement was repeated at another time. The final figure was considered to be that of the average of three readings taken at an interval of 10 min between readings.

2. Lipid profile. In accordance with the National and International Cholesterol Education Program,[9-21] a desirable cholesterol concentration was considered to be <200 mg/dL, the high limit 200-239 mg/dL, and high ≥240 mg/dL. High density lipoprotein (HDL) cholesterol was considered to be altered with figures ≤40 mg/dL. Three levels of low density lipoprotein (LDL) cholesterol were considered: desirable (<100 mg/dL), median risk (100-129 mg/dL), and high risk (≥130 mg/dL). Serum concentrations of triglycerides were classified as follows: desirable (<150 mg/dL), high limit (150-199 mg/dL), high (200-499 mg/dL), and very high (≥500 mg/dL).[5,22]

3. Glycemia. The following values were considered: normal (70-100 mg/dL), altered (101-125 mg/dL), and diabetes (≥126 mg/dL).[23,24]

4. Overweight and obesity. The nutritional status was evaluated with the body mass index (BMI).[2,6,25,26] According to the BMI, the subject was classified as: thin (< 20), normal (from ≥20 to <25), overweight (from ≥25 to < 30). and obese (≥30).

5. Waist circumference. The subject was considered to have an increased waist circumference if the waist

measurements were above the following: men (≥102 cm) and women (≥88 cm).

6. Metabolic syndrome. In accordance with the Treatment of High Blood Cholesterol in Adults (ATPIII), the presence of at least three of the following CVRF was required: enlarged abdominal circumference, hypertriglyceridemia, reduced HDL cholesterol, altered fasting hyperglycemia (>110 mg/dL), and altered BP (above 135/80).

7. Physical exercise. A subject was considered to have a sedentary lifestyle if he or she undertook fewer than 15 min physical exercise three times per week.[27]

8. Smoking. The subjects were classified into two categories: non-smokers (ex-smokers who had ceased smoking at least one year previously and those who had never smoked) and regular or current smokers (daily and occasional smokers).

Biochemical data, obtained from a blood sample drawn after a 12-14 h fast, included measurements of the lipid profile, blood glucose, and others (glutamic oxalo-acetic transaminase, glutamic pyruvic transaminase, alkaline phosphatase, total bilirubin, albumin, total proteins, uric acid, ureic nitrogen, phosphorus, and calcium).

Laboratory Measurements

The measurements were made under standardized conditions according to the national and international norms. A BTS-370 plus (BioSystem, Spain) automated analyzer was used and the reagents were from Bio-System. The LDL cholesterol was calculated from the Friedewald equation[28]:

LDL cholesterol=total cholesterol–(HDL cholesterol+ [triglycerides/5]).

The results were given to each student and students with altered parameters were referred to the University Health Service.

Statistical Analysis

The data were computerized using double independent entry by trained personnel. Ten percent of the computerized data was revised to verify consistency (keyboard errors). The data were analyzed using the software program SPSS 11.5 for Windows. For the analysis of the results for each CVRF, we calculated the prevalence for the general population, and separated according to sex and according to age groups. For comparison between groups we used the χ^2 test or Fisher's test for the difference between proportions. The differences between continuous variables in different groups were evaluated with the Student *t* test. Values >5% were considered to be significant.

RESULTS

Of the total number of students studied, 319 (40.7%) were men with an average age of 21.1(2.3) years, and 464 (59.3%) were women, whose average age was 21.3(2.2) years. Zero point nine percent of the students involved were married, most of whom were women (85.7%). According to the information provided by the University Student Welfare Unit, some 50% of the students had a low social and economic level, 35% a medium level, and 15% a medium-high or high level. Concerning the region of origin of the students, 74.0% were from the VII Region of Maule, 15.9% from the VI Region, 5.8% from the VIII Region, 3.8% from the Metropolitan Region, and 0.5% from other regions in the country. Within the VII Region, the most represented urban communities were Talca (60.8%), Curicó (15.0%) and Linares (7.3%), and the most represented rural communities were San Clemente (15.4%), Maule (14.1%) and Curepto (11.5%). Sixty point six percent of the students lived with one or both parents or relatives and 39.4% lived alone, with friends, or with a partner. A family history of hypertension was reported to be present in 46.0% of the students, DM

TABLE 1. **Cardiovascular Profile of the University Student Population Studied**

	Total (n=783)		Men (n=319)		Women (n=464)		*P* (M/F)
	Average	SD	Average	SD	Average	SD	
BMI	24	4	25	4	23	4	<.0001
Waist circumference (cm)			90	9	82	48	*
SBP (mm Hg)	116	13	122	14	112	11	<.0001
DBP (mm Hg)	74	11	76	13	72	9	<.0001
Total cholesterol (mg/dL)	175	32	174	33	173	31	.726
HDL cholesterol (mg/dL)†	54	7	53	7	54	7	.003
LDL cholesterol (mg/dL)†	102	30	102	30	102	29	.972
Triglycerides (mg/dL)†	96	41	99	39	93	43	.058
Glycemia (mg/dL)	74	10	76	10	73	10	.33

HDL: high density lipoprotein; LDL: low density lipoprotein; SD: standard deviation; BMI: body mass index; M: male; F: female; SBP: systolic blood pressure; DBP: diastolic blood pressure.
*Analysis not applicable, as different normal values were used for men and women.
†Total number: 710; 284 men and 426 women.

in 38.5%, smoking in 18.5%, obesity in 18.2%, and acute myocardial infarction in 17.9%.

Blood Pressure

The average SBP and DBP was 116(13) and 74(11) mm Hg, respectively. According to sex, the SBP and DBP for the men were 122(14) and 76(13) mm Hg, respectively, and for the women, 112(11) and 72(9) mm Hg, respectively (*P*<.0001) (Table 1). Some degree of hypertension was present in 12.8% of the students, 22.9% in the men, and 5.8% in the women (*P*<.0001) (Table 2). One point two percent of the students had a high normal BP, and 10.6% had grade 1 hypertension (18.8% of the men and 5.0% of the women) (*P*<.0001) (Table 2).

Obesity

The BMI in the male students was 25(4) and in the female students it was 23(4) (*P*<.0001) (Table 1). Thirty-two point eight percent (45.5% of the men and 24.3% of the women) had a BMI ≥25, that is they were either overweight or obese (Table 2).

Waist Circumference

The male students had an average waist circumference of 90(9) cm and the female students 82(48) cm (Table 1). An increased waist circumference was present in 10.0% of the men and 14.7% of the women (*P*=.056) (Table 2).

Lipid Profile

The average concentration of total cholesterol was 175(32) mg/dL (174[33] mg/dL in the men and 173[31] mg/dL in the women) (Table 1). Hypercholesterolemia (≥200 mg/dL) was present in 20.2% of the students, with no differences according to sex (20.2% of the men and 20.3% of the women) (Table 2); 35.2% had concentrations of 200-210 mg/dL, 23.9% between 211 and 220 mg/dL, 17.6% between 221 and 230 mg/dL, and 23.3% >230 mg/dL.

The concentration of HDL cholesterol was significantly lower in men (53[7] mg/dL) than in women (54[7] mg/dL) (*P*<.003) (Table 1), with 2.3% of the students having reduced HDL concentrations (4.4% of the men and 0.9% of the women; *P*=.0012) (Table 2). The average LDL cholesterol concentration was 102(30) mg/dL (102[30] mg/dL in the men and 102[29] mg/dL in the women; *P*=NS) (Table 1). Increased concentrations of LDL cholesterol were present in 43.9% of the students (43.9% of the men and 43.8% of the women; *P*=NS) (Table 2). Of note was the fact that 17.6% (18.8% of the men and 16.8% of the women) had high risk concentrations of LDL cholesterol (Table 2). The average concentration of serum triglycerides was 96(41) mg/dL (99[39] mg/dL in the men and 93[43] mg/dL in the women; *P*=NS) (Table 1). Eight point one percent of these students had increased levels of triglycerides (8.8% of the men and 7.7% of the women; *P*=NS) (Table 2) and 2.1% of the students (2.8% of the men and 1.6% of the women) had high concentrations of triglycerides (Table 2).

TABLE 2. **Prevalence of Cardiovascular Risk Factors in Men and Women**

	Total (n=783)	Men (n=319) (40.1%)	Women (n=464) (59,9%)	*P* (M/F)
Overweight+obesity	32.8	45.5	24.3	<.0001
Overweight	25.7	35.7	18.9	<.0001
Obesity	7.2	9.7	5.4	.020
Hypertension	12.8	22.9	5.8	<.0001
Normal high	1.2	2.2	0.7	.0573
Hypertension grade 1	10.6	18.8	5.0	<.0001
Hypertension grade 2	1.0	1.9	0.3	.002
Increased waist circumference	12.8	10.0	14.7	.056
Hypercholesterolemia (≥200 mg/dL)	20.2	20.2	20.3	.949
High limit (200-239 mg/dL)	17.2	16.3	17.9	.564
Raised (≥240 mg/dL)	3.0	3.9	2.4	.258
HDL cholesterol ≥40 mg/d*	2.3	4.4	0.9	.0012
LDL cholesterol ≥100 mg/dL*	43.9	43.9	43.8	.703
Median risk (100-129 mg/dL)*	26.2	25.1	26.9	.622
High risk (≥130 mg/dL)*	17.7	18.8	16.9	.214
Triglycerides ≥150 mg/dL*	8.1	8.8	7.7	.574
High limit (150-199 mg/dL)*	5.8	6.0	5.9	.800
High (200-499 mg/dL)*	2.1	2.8	1.6	.179
Very high (≥500 mg/dL)*	0.2		0.2	
Altered glycemia (101-125 mg/dL)	1.4	1.6	1.3	.744
Diabetes mellitus	0.0	0.0	0.0	
Smoking	39.8	39.2	40.1	.606
Sedentary lifestyle	91.5	85.9	95.3	<.0001

HDL: high density lipoprotein; LDL: low density lipoprotein; M: male; F: female; *n=710; 284 men and 426 women.

Glycemia

The average fasting glycemia concentration for all the students was 74(10) mg/dL, with no significant differences between sexes (76[10] mg/dL in the men and 73[10] mg/dL in the women) (Table 1). Just 1.4% of the students (1.6% of the men and 1.3% of the women) had elevated concentrations of blood glucose, not surpassing 125 mg/dL (Table 2).

Metabolic Syndrome

Seven students (1.0%) had the metabolic syndrome (four cases with hypertension, increased waist circumference, and hypertriglyceridemia; two cases with hypertension, increased waist circumference, and reduced HDL cholesterol, and finally, one case with hypertension, increased waist circumference, reduced HDL cholesterol, and hypertriglyceridemia). No differences were found between men and women.

Physical Activity

A sedentary lifestyle was considered to be present in 91.5% of the students (85.9% of the men and 95.3% of the women; *P*<.0001) (Table 1).

Smoking

Thirty-nine point eight percent of the students said they were smokers (39.2% of the men and 40.1% of the women) (Table 1). Forty-two point seven percent of the parents of the students and 63.2% of the non-smoking students let others smoke in an enclosed area, and considered themselves passive smokers.

Cardiovascular risk factors were present in 97.2% of the students, more frequently in women (59.7%) than in men (40.3%) (*P*=.013). Most had one or two CVRF, with the following combinations being more common: smoking and a sedentary lifestyle (16.3%), hypercholesterolemia and a sedentary lifestyle (5.8%), increased BMI and a sedentary lifestyle (4.9%), and hypertension and a sedentary lifestyle (3.2%).

Other Biochemical Parameters

The other biochemical parameters provided the following information: glutamic oxalo-acetic transaminase, 24(10) U/L; glutamic pyruvic transaminase, 25(11) U/L; alkaline phosphatase, 67(22) U/L; bilirubin, 0.6(0.3) mg/dL; albumin, 4(1) g/dL; total protein, 8(1) g/dL; urea nitrogen, 12(4) mg/dL; phosphorus, 4(1) mg/dL; calcium, 10(1) mg/dL; uric acid: men 5(1) mg/dL and women 4(1) mg/dL. Hyperuricemia was present in 1.4% of the students and increased levels of glutamic oxaloacetic transaminase in 5.2%.

Comparison of the prevalence of CVRF according to the origin of the students, urban or rural, showed that obesity was more frequent in students from a rural origin (13.3%) than urban (5.4%) (*P*=.002). On the other hand, smoking was more common in students from an urban origin (41.1%) than rural (23.3%) (*P*=.024).

DISCUSSION

Cardiovascular risk factors are the leading cause of death in the world and Chile is no exception. The aim of this study was to determine the prevalence of CVRF in a population of young university students from the center south region of Chile.

Hypertension produces multiple adverse effects in the cardiovascular system if it continues for some time.[29] The prevalence of hypertension in 12.8% of the young people studied is greater than that found in the 2003 National Health Survey (NHS) undertaken by the Chilean Ministry of Health (5.6% of young people aged 17-24 years)[30] and by Chiang-Salgado et al[31] in university students (5.8% in men and 3.3% in women); it is, however, lower than the 18.6% found in the urban area of the VIII Region in Chile in persons older than 14 years of age.[32] The prevalence of hypertension in the Spanish population is 41.1% in men and 38.2% in women (aged 25 to 74 years)[33] and 30.4% in men and 15.2% in women (aged 35 to 44 years).[34] The greater prevalence of hypertension in the young university students in this study than that found in the general Chilean population of young persons could be because this subpopulation of students is subjected to particular conditions of stress.

Obesity is known to raise the risk for other CVRF.[3] Some 32.8% of the students were either overweight or obese, though we are unable to account for the fact that men were more often obese than women. In the 2003 NHS this condition was detected in 25.4% of young persons aged 17-24 years (8.6%, obesity and 16.8%, overweight).[30] In young persons aged 22 to 28 years, Bustos et al found a prevalence of overweight or obesity of 46.4% in men and 49.1% in women. In Spain, Rigo Carratala et al[34] found that 15.9% and 16.7% of the men and women, respectively, were obese, and Masia et al[33] in a population aged 25 to 74 years found that 19.0% were obese.

Waist circumference is used as an indicator of abdominal obesity.[35,36] Considering a cut-off point of >102 cm for the men and >88 cm for the women, 12.8% of the students had a greater waist circumference than normal, unlike the data reported by Bustos et al,[3] who found this situation in 30.8% of a population of young adults (aged 22-28 years). This difference could be partly due to the fact that the average age, whilst still young, was greater in their study than in ours.

Dyslipidemia is another of the main risk factors, though it is partially modifiable. In our study, 20.2% of the students had some degree of hypercholesterolemia, with no differences between men and women. The 2003 NHS found that 7.1% of young persons aged 17 to 24 years had hypercholesterolemia (>200 mg/dL).[30] In Spain,

hypercholesterolemia (total cholesterol >250 mg/dL) affects 18%-27% of men and 17%-24% of women.[37] Chiang-Salgado et al[31] found figures of 29.4% in women and 29.0% in men. Although the difference in the average concentration of HDL cholesterol between men and women was significant, the magnitude of the difference, 1 mg/dL, is less than that found in other national Chilean[31] and Spanish[28,33] studies, which found differences of approximately 10 mg/dL. Bustos et al,[3] however, found no significant differences in a young Chilean population. Only 2.3% had reduced concentrations of HDL cholesterol and 43.9% of the students had raised LDL cholesterol concentrations. Bustos et al[3] found this situation in 45.8% and 10.5%, respectively, of the study population (22-28 years of age). The frequency of hypertriglyceridemia was slightly lower (8.1%) than that found in the above mentioned study (15.7%).[3]

Unpublished data belonging to a study undertaken in first year students from the University of Talca between April and May 1997, and whose ages at the time of the study ranged from 16-19 years, showed that 14.3% of the students had cholesterolemia ≥200 mg/dL, a similar figure to that seen in students of the same age group in the present study (15.2%).

As well as the isolated main CVRF, the metabolic syndrome is also considered a CVD. We found this syndrome to be present in about just 1.0% of the students. This figure rises to 1.5% if we consider the American criteria, which include an altered baseline glycemia >100 mg/dL and an altered waist circumference >90 cm in men and >80 cm in women. This prevalence is lower than the 4.6% found in the NHS among young persons aged 17-24 years. Alegría et al,[38] in a study of the Spanish population aged 20 to 39 years, found a prevalence of 5.5% in men and 3% in women.

The lower prevalence of the metabolic syndrome in our students as compared with the young persons studied in the 2003 NHS[38] may be accounted for by the fact that our students were university undergraduates, a subpopulation of young persons who, given their educational level, are more aware of the CVRF. Additionally, although around 20% of the students had hypercholesterolemia, in 60% of these the total cholesterol concentration was <220 mg/dL, which could be related with the fact that a low percentage of students had reduced HDL cholesterol levels, one of the criteria for the metabolic syndrome. Using the new definition of the metabolic syndrome proposed in 2005 by the International Diabetes Federation (IDF),[39] 1.8% of the students had the metabolic syndrome. This proposal includes an increased waist circumference (men >90 cm and women >80 cm) and two of the following conditions: altered BP (SBP >135 mm Hg or DBP >85 mm Hg), fasting hyperglycemia (>100 mg/dL), reduced HDL cholesterol (men ≤40 mg/dL and women ≤50 mg/dL) and hypertriglyceridemia ≥150 mg/dL).

No cases of DM were found in the study population, although 0.4% of the young persons aged 17 to 24 years were found to have DM in the 2003 NHS.[30] Another study undertaken in the VII Region of Maule in 2002 found that 1.9% of persons aged 20-44 years had DM.[40]

Considering a sedentary lifestyle, a habit that is becoming more ingrained in our young people, we found that about 90% were classified as having a sedentary lifestyle, a situation that does not much differ from other studies. The 2003 NHS found that 82.2% of the young persons aged 17 to 24 years had a sedentary lifestyle.[30] The CARMEN (Conjunto de Acciones para la Reducción Multifactorial de las Enfermedades No transmisibles – Set of Actions for the Multifactorial Reduction of Non-communicable Diseases) program undertaken in Valparaiso (V Region, Chile) showed that 84.6% of those surveyed had a sedentary lifestyle.[41] Another study found that nearly 80% of employees in Santiago had a sedentary lifestyle.[20] These data are of concern, since it is known that ischemic cardiopathy is twice as frequent in persons with a sedentary lifestyle than in active persons.[1]

Smokers are known to have twice the risk for CVD than non-smokers.[42,43] The data obtained show that 40% of the students, with no difference between men and women, admitted smoking. The 2003 NHS found that 54.5% of young persons aged 17 to 24 years smoked.[30] Bustos et al[3] reported that 57% of young adults, both men and women, smoked. Rigo et al,[34] in a Spanish population from the Balearic Isles aged 35 to 44 years, found a prevalence of 49.3% in men and 36.6% in women. In another Spanish study, the prevalence of smoking among women aged 25-34 years was 45.6%.[33] The inclusion of passive smokers (students who let others smoke in closed spaces) would raise this figure to around 66.0%. This indicates that not only should the habit of not smoking be motivated, but also the habit of not letting other people smoke in closed spaces. In Chile, this situation will be encouraged with the introduction of a recently passed law restricting smoking.

In summary, we found that an important percentage of young university students included in the present study had CVRF (overweight or obesity, smoking, a sedentary lifestyle, hypercholesterolemia, or hypertension). Considering that the CVRF generally have a direct or indirect pathological effect over the long term, and if we consider that some of the CVRF are modifiable by changes in lifestyle, it seems necessary that in the governmental sphere, with the participation of ministries such as those of health and education, political decisions are taken that, together with the anti-smoking law, lead to advances in a healthy lifestyle. Intervention programs that include physical exercise or dietary modifications are no longer enough in certain groups of the population as, despite the fact that they may afford good results, they do not ensure the continuation of a healthy lifestyle over time. To this extent, the situation regarding CVRF in today's university students, men and women, is especially poignant, as it is they who will be taking the future decisions in this country.

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