



## Cardiovascular Risk Factors, Diet and Lifestyle among a Group of Italian Young Adults Students

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### Abstract

The prevalence of cardiovascular disease has shown a marked increase over the last decade, representing the leading cause of death in the United States of America but also in Italy. Cardiovascular diseases recognize a multifactorial etiology: age, obesity, distribution of body fat, cigarette smoking, sedentary lifestyle, high blood pressure, dyslipidemia. In recent years has been paid particular attention to the cardiovascular risk factors prevention particularly in adulthood (> 30 years old). The aim of our study was to evaluate the lifestyle in young subjects (20 years old) particularly in a group of students of the Valle Sabbia (a mountain zone in the North of Italy) using dedicated questionnaire, anamnesis, physical examination and blood tests + ECG.

### Keywords

Cardiovascular prevention; Risk factors; Young

### Introduction

The prevalence of cardiovascular disease has shown a marked increase over the last decade, and now represent the leading cause of death in the United States of America and in Italy.

The main cause lies in the development of well-known risk factors such as smoking, increased level of cholesterol, obesity, high blood pressure, diabetes and low physical activity [1].

For example dyslipidemia has, as common denominator, insulin resistance and consequent hyperinsulinemia. In this way diet plays an important role because it can interfere with insulin system in 2 ways: modulating insulin secretion and interfering with peripheral insulin action. Especially diet rich in fiber is able to adjust insulin circulating levels and to reduce its secretion thanks to the amount of intestinal reabsorption. Furthermore the increase in insulin sensitivity is associated with a reduction in body weight [2].

Usually we wait to correct risk factors until the patients start to develop symptoms or reaches adulthood (30-40 years old). It's

instead very important to prevent the rising of risk factors from the young age.

The problem is that a large amount of young people are not able to connect their habits with the future cardiovascular disease and they are convinced to follow a healthy lifestyle while they do not [3].

This lack of insight induced us to analyze the lifestyle of a group of student belong to the last year of an high school in a mountain zone of the north Italy (Valle Sabbia) using a dedicate questionnaire, anamnesis, physical examination, blood analysis and an electrocardiogram.

### Method

This is an observational study. We evaluate 68 healthy volunteers, from 18 to 20 years old, of different gender. All of them were students of the last year of High School in Valle Sabbia (Italy), nobody had refused to participate at the study. There were no exclusion criteria. We investigated, using a questionnaire, the family story and the physiological and pathological anamnesis. We performed physical examination obtaining height (in cm), weight (in Kg) and waist circumference. We measured blood pressure with a manual sphygmomanometer (three times and we used mean values) and we performed an electrocardiogram in 12 leads (with a 12-channel interpretive ECG Electrocardiograph ECG-1350K CardiofaxM NIHON KOHDEN), after 5 minutes of rest in clinostats. We performed a blood analysis for CBC, glycaemia, lipids and kidney and liver function, samples were taken at fast. Volunteers have to complete a questionnaire, made by us for this study and called "Knowing yourself n°1", in order to analyze habits and lifestyle with simple question about diet, voluptuary habits and physical activity. We considered smoker people everyone who smoke more than 2 cigarettes in a day and alcohol consumer people who drink more than 12 grams of alcohol in a week that correspond to 330ml of beer, 125ml of wine, 40ml of super-alcoholic cocktail.

We use simple average count and percentage to examine each factor because we haven't a sufficient number to perform other statistical analysis.

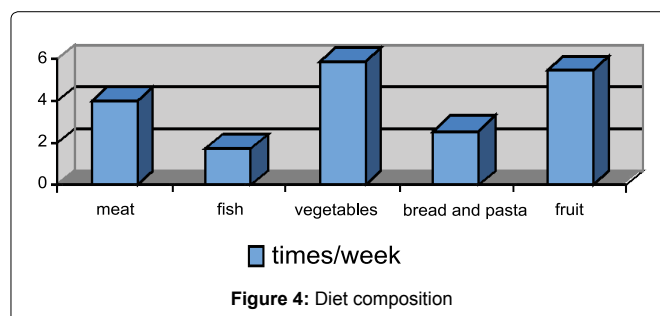
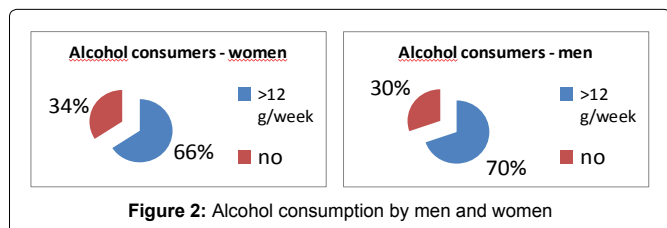
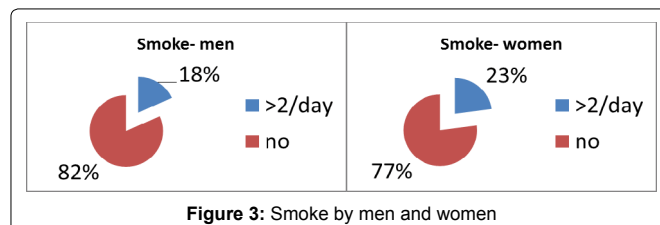
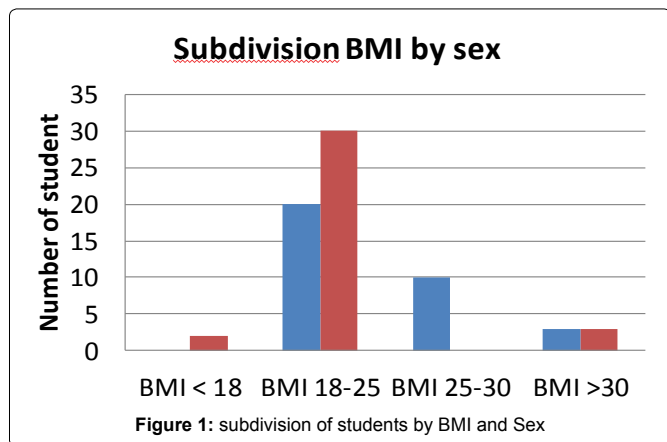
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Table 1: Results

	Male	Female	% out of range
BMI	24.08 ± 3.49kg/m <sup>2</sup>	20.37±3.53 kg/m <sup>2</sup>	27%
Waist-Circumfer	85.7 ± 9.9cm	77.45 ± 10.23cm	11%
Total cholesterol	160.5 ± 32.5mg/dL	182 ± 32mg/dL	30%
HDL	48.2 ± 12mg/dl	66.2 ± 14.8mg/dL	13%
LDL	101.2 ± 28.5mg/dl	99.7 ± 26mg/dl	48%
TGL	69.7 ± 24.3mg/dl	70.7 ± 24.6mg/dl	1.5%
Blood Pressure	119.7 ± 11.7/78.2 ± 9.9mmHg	108.30 ± 58.7/70.7 ± 3.6mmHg	10%



Results

We evaluate 35 female and 33 male with a mean age of 19.01 ± 0.5.

The average body mass index was 20.37 ± 3.53kg/m<sup>2</sup> for women and 24.08 ± 3.49 kg/m<sup>2</sup> for men (Figure 1), waist circumference were 77.45 ± 10.23cm in women and 85.7 ± 9.9cm in male. Mean blood pressure was 108.30 ± 58.7/70.7 ± 3.6mmHg in women and 119.7 ± 11.7/78.2 ± 9.9mmHg in men. Mean total cholesterol was 182 ± 32mg/dl for women and 160.5 ± 32.5mg/dl for men; HDL 66.2 ± 14.8mg/dl for women and 48.2 ± 12mg/dl for men; LDL 99.7 ± 26 mg/dl and 101.2±28.5 mg/dl; triglycerides 69.7 ± 24.3mg/dL for women and 70.7 ± 24.6mg/dl for men.

All the results are shown in table 1; we use as reference the last ESC guidelines for cardiovascular disease prevention [8].

No one had glycemic disease or electrocardiographic alteration.

About lifestyle and voluptuary habits we found that the 60% of the population declared to drink alcohol (wine or beer) and 36% also spirits. The 20% of them were regular smoker (6 M and 8 W) with an average number of cigarettes of 8.7/day and 55% of them were exposed to second-hand smoke. The 65% of the volunteers drink coffee with an average of 2.39 ± 1.78/day (Figure 2,3).

All affirmed to play agonistic sports at least 2 times a week and to have a variable diet (meat for 4 times a week; sausages 3.4/week; vegetables 5.9/week; cheese 3/week; fish 1.7/week; eggs 1.1/week; bread and pasta 2.6/week; rice 9/week and fruit 5.5/week) (Figure 4).

Every student works at the computer for a mean time of 2.72 ± 1.27 hours/day.

Discussion

Literature is poor about study of prevalence of cardiovascular risk

factors in young people especially in those with an age < 20 years. This population is not impacted by information programs so they could institute wrong behavior patterns that may influence lifetime their cardiovascular risk; it's important to develop the appropriate prevention strategies before lifestyle habits become well established [4].

Several studies have demonstrated significant gender difference in cardiovascular disease. A higher prevalence of coronary vessel disease (CVD) is commonly found in young adult men compared with women with a presentation approximately 10 years later in women [5]. It is now undisputed the role of cigarette smoking as a risk factor and his relation with an increased risk for CVD. Pearson et al. [6] studied young adults, between the age of 19 and 35 years old, and reported that individuals who have smoked 2 packs/day have an increased risk for developing CVD at 30 years (8.6% vs 2.0% for non-smokers). In addition Berenson et al. [7] reported that fatty-streak lesions in coronary vessels were higher in young adults who smoked versus non smokers.

There aren't organized study regarding high blood pressure in young and cardiovascular disease but is well known that atherosclerotic lesions are correlated to systolic blood pressure.

The Johns Hopkins Precursors Study, The Bogalusa Heart Study and the CARDIA [1,4,7] confirmed that high lipid value during young adulthood is associated with CVD in later decades. The Bogalusa Heart Study [7] examined multiple risk factors such as BMI, blood pressure and lipid levels from childhood to young adulthood and found that the prevalence of fatty streaks in coronary arteries increased approximately of 85% from the age of 21 to 39 years compared with 50% with children from 2 to 15 years. So early prevention in lipid level is beneficial to maintain cardiovascular health during the aging process.

In the ESC guidelines [8] diet is the mainstay of treatment for dyslipidemia in childhood, associated with treatment of underlying metabolic disorders.

There is evidence from carotid ultrasound measurements that increased carotid intima media thickness (CIMT) compared in siblings

who have inherited heterozygous familial hypercholesterolaemia can be detected from the age of 10 years onwards, and that the progression of increasing CIMT can be delayed with statin therapy. The exact age at which start statin treatment is, however, a matter for clinical judgment. Generally treatment before the age of 18 years would be indicated in boys with a particularly adverse family history, because it is known that the age at which first-degree relatives develop symptomatic CAD is fairly closely correlated [9].

Several studies have reported an insufficient screening rate of lipid level in young. The risk chart of ESC guidelines starts to calculate the risk from 40 years old. Yoon et al. [10] reported that young adults lack Knowledge regarding CVD risk factors. This may have resulted in less motivation for lipid screening and preventive care.

Some authors investigated groups of young population and evidenced how elevated BMI, low physical activity and a fatty diet are the main risk factors for future hypertension, diabetes and high lipid value developments [11-14].

Our data show how there is a good control of the main cardiovascular risk factors due to a correct and varied diet and sport activity but there is a lack in consideration about the risk related to smoke and alcohol drinking. However, it is clear that the data regarding smoking are markedly improved compared to the past and this is obviously to be related to the numerous information campaigns and to the entry into force, in Italy, of the law that have prohibited to smoke in public places. On the contrary, still no information action has been programmed about the damage associated with alcohol which indeed is experienced, particularly at this stage of life, as something not dangerous. It is also very important to notice that there is a very few difference in incidence of smoking and alcohol assumption between boys and girls so we will have to take into consideration in future information campaigns. Recently an Italian Health Examination Survey has been published and it analyzes the change in lifestyle and the prevalence of the main cardiovascular risk factors over 2 periods of time (1998-2002 and 2008-2012) in Italian patients. It evaluates the difference between male and female in a range of 35-74 years old [15]. It's clear that there is a decrease in the prevalence of the main cardiovascular risk factors especially of the metabolic syndrome (maybe due to a better treatment of the cardiovascular risk factors). Healthy habits instead aren't improved yet and sedentary lifestyle and uncorrect diet are followed by too much people, while smoking habit is decreased.

Our small study showed a significant difference, compared to national population, about data on physical activity and health status, which appear encouraging about the general decrease in physical inactivity and obesity. Sure it's a different class of patients (18-20 years old vs 35-74) but it could be a good starting point. This difference is probably related to the high average socio-economic level of the study population, however, of too small size for any generalization.

## Conclusion

This study and the literature review have demonstrated the importance of screening for cardiovascular risk factors in young people. The identified risk factors should be considered serious in young adults in the clinical setting because of their impact of CVD development in later decades. There are still insufficient data in young adults to support the current cardiovascular risk factor guidelines particularly screening and treatment in young adults. It is also important to fight the voluptuary habits such as smoke and drink also in young and increase in them the perception about the relation with cardiovascular disease in adult.

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