# Comparative Study of the Pro-Atherosclerotic Profile of Students of Medicine and Physical Education

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## Abstract

**Background:** Recent studies have demonstrated a strong association between physical activity, low level of cardiorespiratory fitness and the presence of cardiovascular risk factors.

**Objective:** Compare the level of physical activity, level of cardiorespiratory fitness and cardiovascular risk in students of medicine and physical education.

**Methods:** At the first phase, the International Physical Activity Questionnaire (IPAQ) was used to quantify the physical activity level of 126 students from the 7th and 8th semesters of the physical education and medicine courses. At the second phase, 40 students were randomly selected (20 from each course) to undergo cardiovascular risk assessment and cardiorespiratory fitness. The following data were assessed 1) arterial pressure; 2) body mass index (BMI); 3) percentage of fat (electrical bioimpedance); 4) abdominal circumference (AC); 5) laboratory biochemical assessment; and 6) cardiorespiratory fitness (Kline's Test).

**Results:** The comparison of students of medicine and physical education, respectively, showed a higher frequency of individuals presenting: low level of physical activity (55% *vs* 15.0%; p = 0.008); pre-hypertension measured by SAP (80% *vs* 25.0%; p = 0.000) and by DAP (45% *vs* 5.0%; p = 0.003); overweight (50% *vs* 10.0%; p = 0.006); increased abdominal circumference (25% *vs* 0.0%; p = 0.017); increased total cholesterol (165 ± 28 *vs* 142 ± 28 mg/dl; p = 0.015); increased LDL-c (99 ± 27 *vs* 81 ± 23 mg/dl; p = 0.026); increased glycemia (81 ± 8.0 *vs* 75 ± 7.0 mg/dl; p = 0.013); lower cardiorespiratory fitness (48 ± 8.0 *vs* 56 ± 7.0 ml/kg/min; p = 0.001).

**Conclusion:** Students of medicine presented lower levels of physical activity practice, lower level of cardiorespiratory fitness and higher frequency of cardiovascular risk factors, when compared to physical education students. (Arq Bras Cardiol. 2010; [online]. ahead print, PP.0-0)

**Key words:** Motor activity; exercise; students, medical; physical education and training; risk factors.

## Introduction

The technological development, mainly in the last decades, has resulted in a decrease of the intensity of physical exertion associated with work-related activities. Moreover, due to lack of adequate physical space or the growing trend of electronic games, leisure activities started to become increasingly more passive, resulting in a lower level of daily energy expenditure[1].

The higher the level of physical activity, especially aerobics, the higher the cardiorespiratory fitness of the individual, which can be represented by the increase in the maximum oxygen consumption (VO$_2$ max) and a faster recovery of blood pressure and heart rate parameters after the physical exertion. Low levels of cardiorespiratory fitness are associated with an increasing risk of premature death due to any cause, especially heart diseases[2].

Interventions associated with health promotion and the prevention and control of obesity and cardiovascular diseases, such as the incentive to the practice of physical activities, smoking cessation and nutritional education of the population have acquired great importance as they promote weight loss, decrease in plasma lipid and glucose levels, as well as of arterial pressure[3].

Cardiovascular disease remains the main cause of death among the adult population in the Western world and the increase in the regular practice of physical activity is one of the most important preventive interventions[4].

The teaching of Medical sciences and Physical Education is based on the maintenance, promotion and rehabilitation of health and it is widely known that the physical activity prevents cardiovascular diseases. However, little is known on the frequency of physical activity as part of the life style

of students of Medicine and Physical Education. Moreover, in many fields, there is not a good concordance between knowledge and the ideal conduct to be followed.

The present study aimed at comparing the level of physical activity, the level of cardiorespiratory fitness and the risk of cardiovascular disease in students of Medicine and Physical Education, based on the concept that students of Medicine and Physical Education, during their 4th year of University, have received enough and adequate information (through the curricular content) on the benefits of the preventive measures for cardiovascular diseases, especially the practice of physical activities.

## Methods

### Studied population

The present study was carried out at the Federal University of Sergipe (UFS), after being approved by the Ethics Committee of Research in Human Beings of the aforementioned institution. The present was a descriptive and cross-sectional study[5].

During the first phase of the study, the IPAQ (International Physical Activity Questionnaire) questionnaire was applied to quantify the level of physical activity in 126 students from the 7th and 8th semesters, with 64 of them from the Medicine (35 men and 29 women) and 62 from the Physical Education courses (31 men and 31 women). Of the representative sample of the aforementioned group of 4th-year students, 20

individuals from each group were randomized to undergo specific laboratory tests (Figure 1). When observing in detail the level of physical activity (IPAQ) of each group at the two phases of the study, it is clear that, regarding this variable, the 20 randomly selected individuals represent the selected universal sample.

The inclusion criteria were: 1) to be a regular student at the 7th and 8th semesters of the Medicine and Physical Education courses of UFS; aged between 20 and 30 years. The exclusion criteria included: 1) not accepting to participate in the study; 2) physical impairment that would prevent being included in the study; 3) presence of clinically manifested heart or pulmonary disease. It is worth mentioning that individuals that presented cardiovascular risk (hypertension, diabetes, smokers, etc) were not excluded.

### Variable measurement

#### Phase I

*Level of physical activity*

The IPAQ - International Physical Activity Questionnaire -, a tool developed and recommended by the World Health Organization (WHO), by the Karolinska Institute of Sweden and the US Centers for Disease Control and Prevention (CDC) was used to quantify the level of physical activity practiced by the students[6,7]. Based on the IPAQ results, they were classified as: a) sufficient levels of physical activity, a result equal to active or very active and b) low level of physical activity, a result equal to insufficiently active or sedentary.
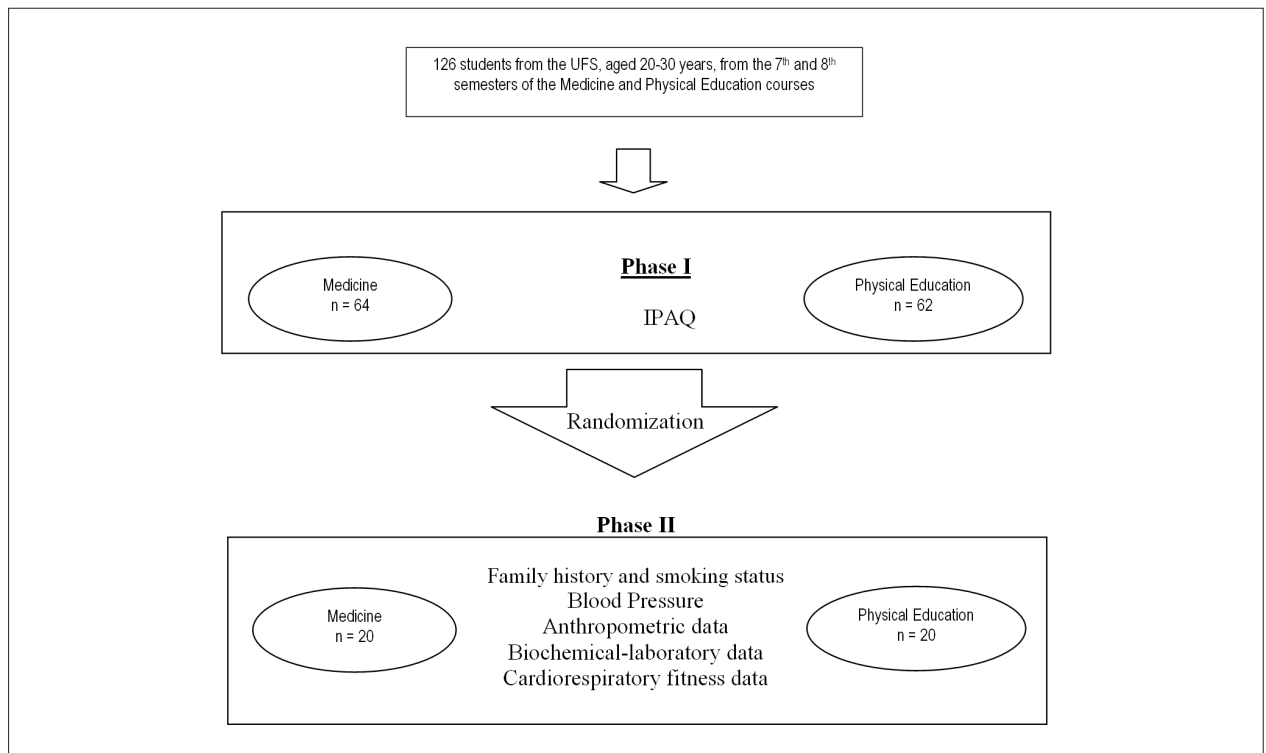


*Figure 1 - Data collection design.*

## Phase II

*Questionnaire for the assessment of family history and smoking status*

Data were collected regarding age, gender, ethnicity, smoking status and family history related to father, mother or sibling, with family history being considered positive when a family member, regardless of the age at the event, presented arterial hypertension (HA), cerebrovascular accident (CVA), acute myocardial infarction (AMI), diabetes mellitus (DM) and obesity.

### Blood pressure measurement (BP)

Three consecutive BP measurements were carried out with individuals in the sitting position, with their back fully supported, on the left arm free of clothing in each individual (with a two-minute interval between the measurements) and the mean of these measurements was recorded. Based on the reference values of the VII Joint National Committee (JNC-7), the students classified as normotensive presented SAP < 120 mmHg and DAP < 80 mmHg, and as pre-hypertensive those with SAP ≥ 120 mmHg and/or DAP ≥ 80 mmHg, respectively[8]. The highest value of systolic or diastolic BP establishes the diagnosis[9]. An OMROM blood pressure measurement device, model HEM 431C, was used for the assessment.

### Body mass index (BMI) assessment

The BMI was obtained by dividing weight, in kilograms, by height, in meters, squared, which allowed the classification of the individual's degree of overweight or obesity[10]. Height was measured in meters, with individuals standing barefoot in the orthostatic position, with the feet side by side and looking straight ahead (Frankfurt plane, parallel to the ground). This measurement was carried out with individuals in inspiratory apnea, after being advised not to shrink any body part when the cursor touched the head. The weight was measured in kilograms and the individuals were obligatorily wearing light clothes and barefoot. An anthropometric Filizola scale with a 150 kg maximum capacity and 100 g divisions was used, which also had a fixed stadiometer capable of measuring up to 2 meters in height and 5.0-cm divisions. A normal body mass index was considered when BMI ≤ 25 kg/m$^2$, whereas a BMI > 25 kg/m$^2$ was classified as overweight/obesity[10].

### Measurement of abdominal circumference (AC)

The AC was measured with an inextensible metric tape, with 1-mm divisions, placed directly on the skin of the assessed individual at the level of the highest abdominal girth during a normal expiration[11]. The individuals were classified as: 1) women with normal abdominal adiposity (AC < 80 cm) and obese women (AC ≥ 80 cm); and 2) men with normal abdominal adiposity (AC < 94 cm) and obese men (AC ≥ 94 cm)[12].

### Electrical Bioimpedance

The electrical bioimpedance was used to analyze the percentage of lean mass (%LM) and fat mass (%FM) of each individual obtained by passing an undetectable electrical current by electrodes previously fixed on the ankle, on the foot, on the wrist and the dorsum of hand, with the individual remaining at least 5-10 minutes on dorsal decubitus position, in total rest, before the test was carried out.

As recommended by the manufacturer, the individuals were asked to refrain from physical activity, alcohol ingestion and food ingestion (12-hour fast) during the 12 hours preceding the test, as well as diuretic agents on the 7 days prior to the test. Individuals were also asked to pass urine 30 minutes before the test was performed. A tetrapolar body composition analyzer (Bioelectrical Body Composition Analyzer, model Quantum II, RJL Sistens) was used. The percentage of fat was classified as: 1) normal, male individuals ≤ 15% and female individuals ≤ 23%, and 2) overweight/obesity, male individuals > 15% and female individuals > 23%[13].

### Biochemical-laboratory tests

A sample of 12 ml of blood was collected by venipuncture for the biochemical measurement of total cholesterol (TC), LDL cholesterol (LDL-c), HDL cholesterol (HDL-c), Triglycerides (TG) and glycemia, after a minimum fasting period of 12 hours. The blood samples were processed and the serum (for TC, TG, LDL-c and HDL-c) and plasma (for glycemia) were analyzed at the Laboratory of Clinical Analyses of the University Hospital of UFS. Serum levels of TC, TG and HDL-c and plasma levels of glucose were measured using an enzymatic-colorimetric method, through the Dimension RXL equipment by Dabe Behring. LDL-c was calculated using Friedwald's formula (LDL-c = TC - HDL-c - TG / 3)[14].

The individuals were classified as:

- TC < 200 mg/dl as desirable /normal and TC ≥ 200 mg/dl as high; HDL-c > 40 mg/dl as desirable/normal and HDL-c ≤ 40 mg/dl as low; LDL-c < 130 mg/dl as desirable /normal and LDL-c ≥ 130 mg/dl as high;
- TG < 150 mg/dl as desirable /normal and TG ≥ 150 mg/dl as high[15];
- Glycemia < 100 mg/dl as desirable/normal and glycemia ≥ 100 mg/dl as high[16].

### Test to estimate cardiorespiratory fitness

We used the walking test developed and validated by Kline et al[17], which consists of walking 1.6 km as fast as possible on a previously defined plane surface, while the heart rate is measured at the last lap using a Polar heart monitor, model A3.

The data collection was carried out individually and, initially, the basal heart rate - bHR (the mean of three measurements) was measured. After that, simultaneously, the chronometer was started and the individual was asked to walk four laps around the inner lane of the athletics track (1,609 km), as fast as possible. At the end of the test, the time was recorded as well as the heart rate of the individual at the end of the exercise (peak HR). Recovery heart rates were recorded after 1, 5 and 10 minutes (rHR1, rHR5, rHR10). The cardiorespiratory fitness, defined as indirect VO$_2$ max test, was obtained from the following equation[17]:

$$\text{indirect } VO_{2\,max} = 132.853 - 0.0769 \text{ (weight in kg)} - 0.3877 \text{ (age in years)} + 6.315 \text{ (sex)} - 3.2649 \text{ (time in minutes)} - 0.1565 \text{ (HR at arrival)}$$

With Sex: 0 for women and 1 for men, male individuals were classified as "more fit" when they presented indirect $VO_2$ max > 52 ml/kg/min and "less fit" when they presented indirect $VO_2$ max $\leq$ 52 ml/kg/min; female individuals were classified as "more fit" when they presented indirect $VO_2$ max > 48 ml/kg/min and as "less fit" when they presented indirect $VO_2$ max $\leq$ 48 ml/kg/min[18].

### Statistical analysis

The quantitative variables were described as means and standard deviations and the qualitative variables as frequencies. The Student's *t* test for independent samples was used for the comparison in the group of quantitative variables, whereas the Chi-square test was used to compare the qualitative variables.

A level of statistical significance < 5% was established for all analyses. The statistical calculations were carried out using the statistical software Statistical Package for the Social Sciences (SPSS) for Windows, release 10.0.

## Results

The comparative analysis of the general clinical data between the groups of students of Medicine (SM) and students of Physical Education (SPE) showed no significant difference regarding age, gender, ethnicity, family history of arterial hypertension, acute myocardial infarction, diabetes, obesity and cerebrovascular accident, as well as smoking status.

### Level of physical activity

#### Phase I

Regarding the level of physical activity between the two study populations (n = 126), it was observed that SM presented lower levels of physical activity when compared to SPE (Table 1).

#### Phase II

Also regarding the level of physical activity between the two randomized groups from the studied populations, it was observed that SM presented lower levels of physical activity when compared to SPE (Table 1) (Chart 1).

### Arterial pressure and basal heart rate (resting heart rate)

The basal SAP (125.7 $\pm$ 8.8 *vs* 116.5 $\pm$ 13.7 mmHg; p = 0.016) and DAP (78.6 $\pm$ 6.2 *vs* 72.7 $\pm$ 6,8 mmHg; p = 0.016) were significantly higher in the SM, when compared to the SPE group (Table 2) (Chart 2). The same analysis, after it was categorized, showed a higher frequency of per-hypertension/hypertension in the SM group, when classified by either the SAP or the DAP (Table 1).

### Anthropometric data

The comparative analysis based on the means and SD for

**Table 1 -** Categorized comparison of the physical activity level, anthropometric and biochemical-laboratory and cardiorespiratory fitness data between MS and PES

| Variables | Medicine n (%) | Physical education n (%) | p |
|---|---|---|---|
| **Phase I** | | | |
| Sufficient level of physical activity | 37 (42) | 56 (90) | < 0.001 |
| Low level of physical activity | 27 (58) | 6 (10) | < 0.001 |
| **Phase II** | | | |
| Sufficient level of physical activity | 9 (45) | 17 (85) | 0,008 |
| Low level of physical activity | 11 (55) | 3 (15) | 0,008 |
| SAP ($\geq$ 120 mmHg) | 16 (80) | 05 (25) | < 0,001 |
| DAP ($\geq$ 80 mmHg) | 09 (45) | 01 (05) | 0,003 |
| BMI (> 25 kg/m²) | 10 (50) | 02 (10) | 0,006 |
| AC (masc. $\geq$ 94; fem. $\geq$ 80 cm) | 5 (25) | 0 (0) | 0,017 |
| %FM (masc. > 15%; fem. > 23%) | 18 (90) | 17 (85) | 0,633 |
| TC ($\geq$ 200 mg/dl) | 02 (10) | 01 (05) | 0,548 |
| HDL-c ($\leq$ 40 mg/dl) | 09 (45) | 04 (20) | 0,091 |
| LDL-c ($\geq$ 130 mg/dl) | 03 (15) | 01 (05) | 0,292 |
| TG ($\geq$ 150 mg/dl) | 01 (05) | 01 (05) | 1,000 |
| Glycemia ($\geq$ 100 mg/dl) | 0 (0) | 0 (0) | - |
| More fit | 5 (25) | 16 (80) | < 0.001 |
| Less fit | 15 (75) | 04 (20) | < 0.001 |

*SAP - systolic arterial pressure; DAP - diastolic arterial pressure; BMI - body mass index; AC - abdominal circumference; %FM - Percentage of fat mass; TC - total cholesterol; HDL-c - high-density lipoprotein; LDL-c - low-density lipoprotein; TG - Triglycerides; total n of students of Medicine = 64 individuals; total n of students of Physical Education = 62 individuals; p - descriptive level of probability.*

anthropometric data did not show a significant difference regarding the BMI, AC, %FM and %LM (Table 2). This same analysis, when categorized, showed a significant difference regarding the BMI and AC, but no significant difference in relation to %FM (Table 1).

### Biochemical-laboratory data

The analysis of the biochemical-laboratory data showed a significant difference regarding TC, LDL-c and glycemia, but no significant difference in relation to HDL-c and TG (Table 2) (Chart 3). The same analysis, after it was categorized, showed no significant difference regarding high TC, low HDL-c, high LDL-c, high TG and high glycemia (Table 1).

### Cardiorespiratory fitness

Regarding the cardiorespiratory fitness, after Kline's walking test, a significant difference was observed regarding the indirect $VO_{2\,max}$ (Table 2) (Chart 4), peak HR, rHR1, rHR5 and rHR 10 (Table 2). The analysis of the cardiorespiratory
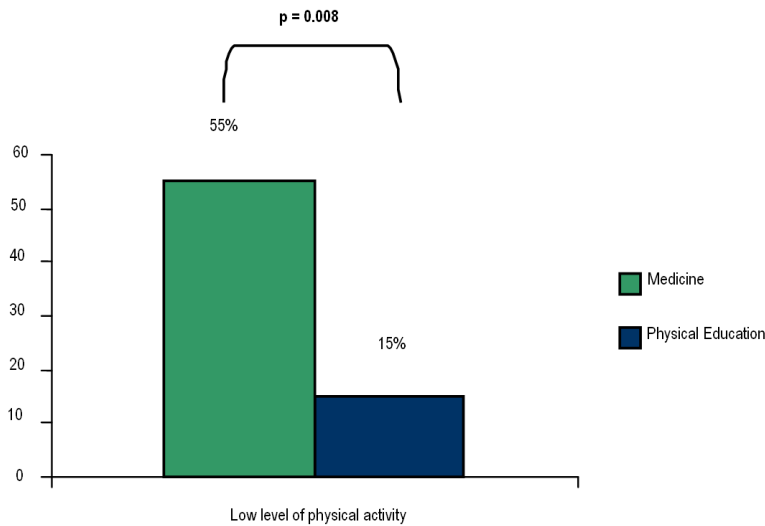
p = 0.008

55%

15%

Medicine

Physical Education

Low level of physical activity

Chart 1 - *Percentage of the physical activity level of the randomized groups in the studied populations.*

**Table 2 -** **Comparison of the level of physical activity, anthropometric, biochemical-laboratory and cardiorespiratory data between MS and PES**

| Variables | Medicine (n = 20) | Phys. Education (n = 20) | p |
|---|---|---|---|
| | Mean ± SD | Mean ± SD | |
| SAP (mmHg) | 125.7 ± 8.8 | 116.5 ± 13.7 | 0.016 |
| DAP (mmHg) | 78.6 ± 6.2 | 72.7 ± 6.8 | 0.007 |
| BMI (kg/m²) | 24.8 ± 4.4 | 23 ± 3.0 | 0.126 |
| AC (cm) | 78 ± 10.2 | 73.7 ± 7.1 | 0.124 |
| %FM | 27.8 ± 8.3 | 23.8 ± 4.7 | 0.069 |
| %LM | 72.2 ± 8.3 | 76.2 ± 4.7 | 0.069 |
| TC (mg/dl) | 165 ± 27.9 | 142.4 ± 28 | 0.015 |
| HDL-c (mg/dl) | 41.6 ± 8.4 | 45.5 ± 8.1 | 0.149 |
| LDL-c (mg/dl) | 99.1 ± 27.1 | 80.8 ± 22.8 | 0.026 |
| TG (mg/dl) | 86.4 ± 31.9 | 81.5 ± 35 | 0.646 |
| Glucose (mg/dl) | 80.8 ± 8.0 | 74.7 ± 6.7 | 0.013 |
| bHR (bpm) | 76.5 ± 12.5 | 73.2 ± 9.6 | 0.355 |
| Peak HR (bpm) | 155.2 ± 18.1 | 138.6 ± 20.4 | 0.010 |
| Indirect VO₂ max. (ml/ kg/min) | 47.8 ± 8.1 | 56 ± 6.7 | 0.001 |
| rHR 1 (bpm) | 135.7 ± 15 | 115.3 ± 19.7 | 0.001 |
| rHR 5 (bpm) | 115.4 ± 10.6 | 101.7 ± 13.2 | 0.001 |
| rHR 10 (bpm) | 108.8 ± 11.6 | 96.4 ± 13.7 | 0.004 |

*SAP - systolic arterial pressure; DAP - diastolic arterial pressure; BMI - body mass index; AC - abdominal circumference; %FM - Percentage of fat mass; %LM - percentage of lean mass; TC - total cholesterol; HDL-c - high-density lipoprotein; LDL-c - low-density lipoprotein; TG - Triglycerides; bHR - basal heart rate; peak HR - maximum test heart rate; rHR 1- recovery heart rate after 1 minute; rHR 5 - recovery heart rate after 5 minutes; rHR 10 - recovery heart rate after 10 minutes; p - descriptive level of probability; Mean ± SD - mean ± standard deviation.*

fitness, after it was categorized, showed that the SM are less fit when compared to the SPE (Table 1).
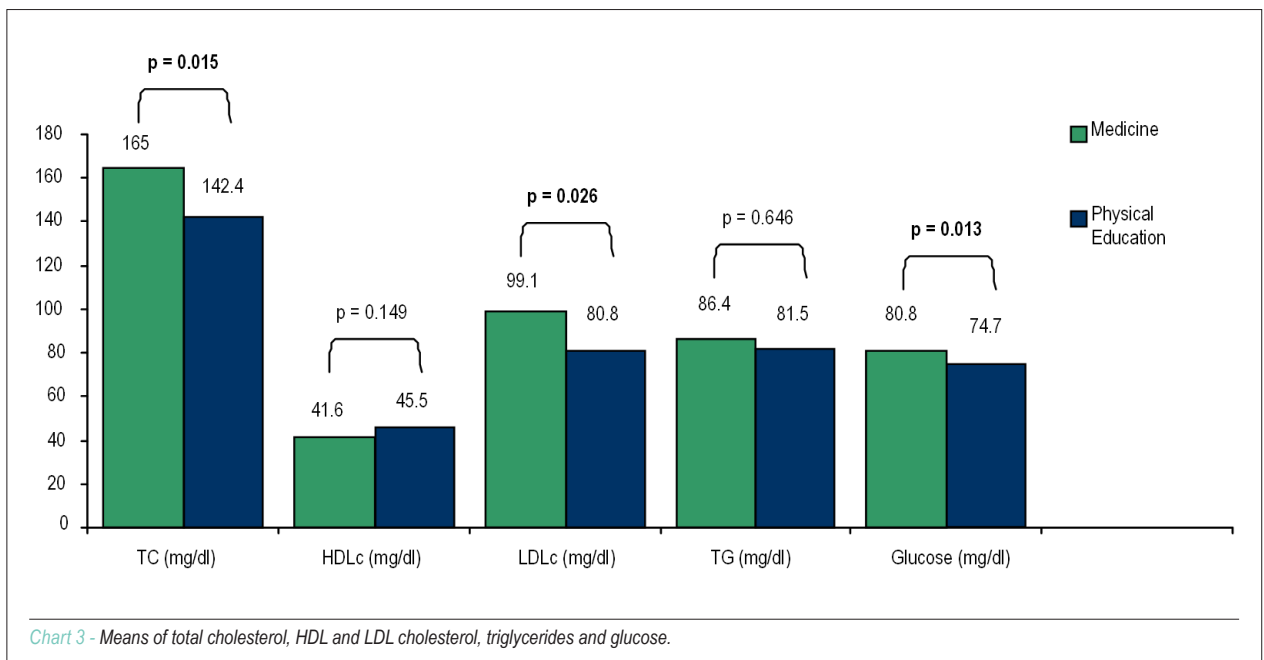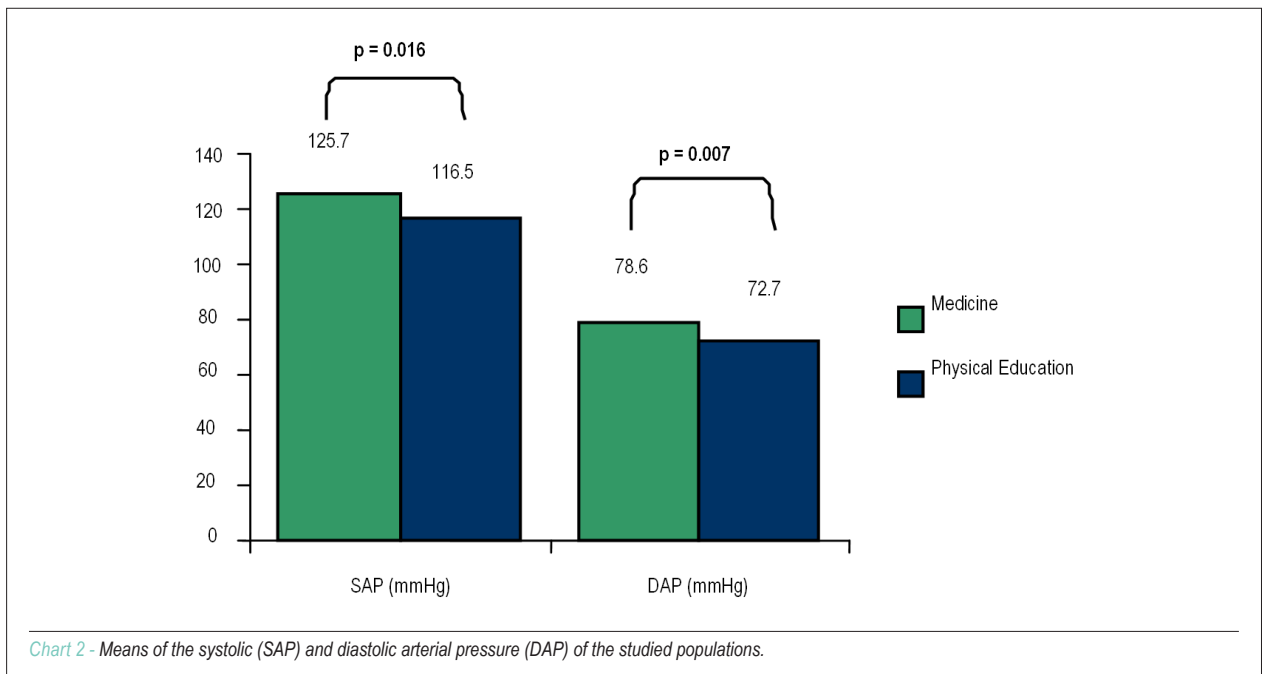
## Discussion

The main findings of the present study were that SM presented a lower level of physical activity, lower level of cardiorespiratory fitness and evidence of a pro-atherosclerotic profile, when compared to physical education students from the same university and paired by age and sex.

These data are intriguing and raise the question that only the knowledge on risk factors is not enough to promote healthy life-style practices. Based on the assumption that both groups had the theoretical knowledge acquired from the curricular content regarding the beneficial effects of physical activity practice on the prevention of cardiovascular diseases, it was reasonable to speculate that such knowledge would encourage similar preventive practices. However, when analyzing the level of physical activity through the IPAQ, it was clear that the SM were less active than the SPE.

In agreement with the low levels of physical activity of the SM, studies carried out with students from a private university in the city of São Paulo[19], with students of Nutrition[20] and another one with students of Medicine[21] showed high levels of sedentary life-style: 35.6%, 78,9% and 43.1%, respectively.

Corroborating the data on the SPE, studies carried out with students of Physical Education from the Federal University of Londrina[22] and professor of Physical Education of the State University of Montes Claros - MG[23] showed, respectively, approximate levels of 70% and 65% of individuals that presented sufficient levels of physical activity.

The low level of physical activity, as observed primarily in the SM, is related to the development of chronic-degenerative diseases, such as obesity, hypertension and diabetes[24]. This finding suggests that especially among SM, more effective

*Chart 2 - Means of the systolic (SAP) and diastolic arterial pressure (DAP) of the studied populations.*



*Chart 3 - Means of total cholesterol, HDL and LDL cholesterol, triglycerides and glucose.*

interventionist actions directed at adopting and maintaining a physically active life-style must be carried out during the university years and during the transition period consisting of university formation/professional career[25].

Regarding the BMI, higher body mass indexes were observed among the SM, when compared to the SPE, as the first presented a higher percentage of individuals with overweight/obesity. Obesity, measured by the BMI, has been considered a risk factor for coronary disease[26].

Other studies have demonstrated that individuals with BMI at the normal range, or a little above the normal range, can present alterations that are characteristic of metabolic syndrome[27], as well as at-risk abdominal circumference for cardiovascular diseases[28].

The AC, which was higher among the SM, is strongly associated with metabolic alterations that increase the cardiovascular risk, being considered a better method for predicting cardiovascular risk than total body fat[29,30].
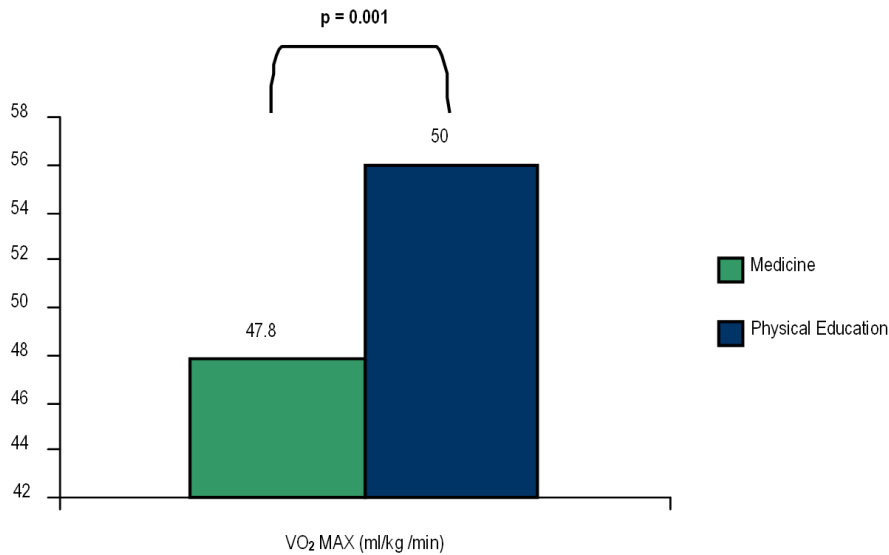
Chart 4 - *Mean of indirect VO$_2$ MAX of the two studied populations.*

Taking into consideration obesity and its association with cardiovascular risk factors, interventions that aim at decreasing body weight, especially central fat, are extremely important for the prevention and control of cardiovascular diseases in the population. Regarding the TC, individuals with high TC levels, similar to the SM in the present study, were observed in study carried out with students of Medicine[21], university freshmen[19] and healthcare professionals[31], who presented levels of de 11.8%, 9.1% and 10.6%, respectively.

A high level of serum cholesterol is one of the main modifiable risk factors for coronary artery disease, presenting a significant correlation with the lack of physical activity practice[21].

Regarding the low HDL-c, it is known that physical activity apparently increases the capacity of the HDL-c to act as a cholesterol receptor. This HDL-c function is an important step in the cholesterol reverse transport process from the extra-hepatic tissues, such as the vascular walls, for posterior excretion by the liver, thus inducing an anti-atherogenic effect[32].

As for the LDL-c, higher means were observed in SM when compared to SPE, as well as a higher number of individuals with high LDL-c, $\geq$ 130 mg/dl. LDL-c is considered a causal and independent factor of atherosclerosis, of which decrease reduces morbimortality[33].

When analyzing TG, higher means were observed in SM when compared to SPE. TG levels seem to be associated with obesity. Additionally, some studies have demonstrated decreased TG levels and high percentage of lean mass[20]. Considering that the SM presented a higher degree of obesity, the also presented higher levels of TG when compared to the SPE.

Regarding the glycemia, higher means were observed among SM when compared to the SPE. The physical activity increases the uptake of glucose, significantly decreasing glycemia and, consequently, decreasing the risk of developing diabetes and cardiovascular diseases[34].

As for the cardiorespiratory fitness, it was observed that SM presented lower indirect VO$_2$ max. Moreover, the peak HR, rHR1, rHR5 and rHR10 of SM also presented higher means when compared to those of SPE, as well as a significantly lower number of individuals classified as more fit for physical activity practice.

The levels of physical activity, cardiorespiratory fitness and other modifiable characteristics related to life-style can influence the risk of chronic disease and premature death. Changes in life-style can, therefore, promote better health and a longevity[35-37].

Recent data have demonstrated that atherosclerosis is a pathology that initiates much before the onset of the atherothrombotic event itself. The finding that the population of SM already presents, at this age range, a higher cardiovascular risk profile suggests that these future professionals will be exposed to an earlier higher burden of cardiovascular risk than other professionals.

In an increasingly more competitive world, in which life behaviors are significantly influenced by professional choices, such finding also raises the interest on the role of professions in the expression of cardiovascular risk. Moreover, one can speculate that only the knowledge seems to be insufficient to trigger effective changes in life-style. Admitting that both groups had sufficient knowledge on the role of life-style in the promotion of health and prevention of cardiovascular diseases, it is clear that, in the present study, the group of students of Medicine presented a lower adherence to a healthy cardiovascular life-style.

The analysis of risk was carried in two ways: 1) considering that the cardiovascular risk of quantitative variables (for instance, blood pressure, cholesterol, glycemia, BMI, etc) is continuous; and 2) categorizing the individuals as pathological and normal,

that is, dichotomizing the risk (example: hypertensive *vs* normotensive, dyslipidemia *vs* normal lipid profile).

Together, the data demonstrate that, both from a categorized point of view, as well as mean *vs* mean, there is evidence that the group of students of Medicine presents an increased cardiovascular risk, i.e., a profile closer to the one that is operationally defined as being pathological.

Although the sample size is a limiting factor, we emphasize the fact that the sample was randomly selected from practically the entire available sample of the 4th year students from the Medicine and Physical Education courses.

## Conclusion

The present study demonstrated that 4th year medical students present a life-style that is compatible with a higher cardiovascular risk when compared to students of physical education. This fact was characterized by a higher frequency of physical inactivity and, associatedly, lower levels of cardiorespiratory fitness. Moreover, medical students presented a clinical and laboratory profile compatible with a pro-atherosclerotic profile, when compared with students of physical education paired by age and sex.

Considering that both groups have enough knowledge on the preventive life-style related cardiovascular role and the control rates of risk factors, such finding demonstrates that the strategy of fighting cardiovascular diseases transcends knowledge itself.

New studies are necessary to evaluate the characteristics of each profession regarding the life style and cardiovascular risk and, mainly, which the best strategies or interventions are to promote changes in the life style, considering the characteristics of each profession.

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