

Relation of the level of physical activity with the clinical, electrocardiographic and depressive profile of medical students

Relação do nível da atividade física com o perfil clínico, eletrocardiográfico e depressivo de estudantes de medicina

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Fujioka PT, Nagaoka VT, Heinritz IL, Ferraz GPL, Kummer L, Roscani MG. *Relation of the level of physical activity with the clinical, electrocardiographic and depressive profile of medical students* / *Relação do nível da atividade física com o perfil clínico, eletrocardiográfico e depressivo de estudantes de medicina*. Rev Med (São Paulo). 2021 Sept-Oct.;100(3):424-30.

ABSTRACT: *Objective.* To understand the clinical profile, cardiovascular factors, depressive profile and the presence of rhythm disorders in medical students at the Federal University of São Carlos (UFSCar), and compare the cardiological assessment and quality of life of inactive and regularly active students. *Method.* Descriptive cross-sectional study was performed in a sample of medical students from UFSCar, with the participation of students from all undergraduate years. For data collection, the Beck and IPAQ scales were applied, and for the assessment of cardiovascular function, electrocardiographic tests were performed. The results were expressed as mean and standard deviation and the comparison of sedentary and active student groups was performed using the Chi-square test for categorical variables and the T test for quantitative variables, with a significance level of $p < 0.05$. *Result.* Eighty-five students were included, 3.5% of whom had a risk factor for cardiovascular disease; 7% had a depressive profile; 40% used legal drugs and 9.5% illegal ones; 13% had electrocardiographic abnormalities; 50.6% were classified as active and 49.3% as inactive. The highest frequency of inactive students was noted in the last year of the course. The use of illicit drugs was significant in active students compared to inactive ones. *Conclusion.* It was found that final year students were more inactive compared to students from previous years. The use of legal and illegal substances was more prevalent among active students when compared to inactive students. There was no significant difference in electrocardiography results between the two groups.

Keywords: Sedentary behavior; Electrocardiography; Students, medical; Motor activity.

RESUMO: *Objetivo.* Conhecer o perfil clínico, os fatores cardiovasculares, perfil depressivo e a presença de distúrbios do ritmo nos estudantes de medicina da Universidade Federal de São Carlos (UFSCar), e comparar a avaliação cardiológica e qualidade de vida de estudantes inativos e ativos. *Método.* Estudo descritivo transversal em amostra de estudantes do curso de medicina da UFSCar, com participação de alunos de todos os anos da graduação. Em relação à coleta de dados, foram utilizadas as escalas de Beck e IPAQ, e para avaliação da função cardiovascular, foram realizados testes eletrocardiográficos. Os resultados foram expressos em média e desvio-padrão e a comparação dos grupos de estudantes ativos e inativos foi realizada por teste Qui-quadrado para variáveis categóricas e teste T para quantitativas, com nível de significância $p < 0,05$. *Resultados.* Foram incluídos 85 estudantes, sendo que 3,5% apresentaram fator de risco para doença cardiovascular; 7% apresentaram perfil depressivo; 40% faziam uso de drogas lícitas e 9,5% de ilícitas; 13% apresentaram anormalidade eletrocardiográficas; 50,6% foram classificados como ativos e 49,3% como sedentários. Foi observada maior frequência de estudantes inativos do último ano do curso. O uso de drogas ilícitas foi significativo nos estudantes ativos comparados aos inativos. *Conclusão.* Os estudantes do último ano de graduação foram mais inativos em relação aos estudantes dos anos anteriores. O uso de substâncias lícitas e ilícitas foi mais prevalente entre estudantes ativos quando comparados aos estudantes inativos. Não houve diferença significativa nos resultados de eletrocardiografia entre os dois grupos.

Palavras-chave: Comportamento sedentário; Eletrocardiografia; Estudantes de medicina; Atividade motora.

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INTRODUCTION

Medical students, during their training period, are exposed to various stressors and situations of high competitiveness. These factors can increase their degree of vulnerability to developing certain habits, such as smoking, drinking, use of illicit drugs or psychotropic medication, in addition to reducing the frequency of physical activity. It is believed that the construction of a curriculum required for professional training may have a negative influence on these habits, impacting a worsening of the student's quality of life^{1,2}.

Studies have shown that, during graduation, there was an increase in the average time set aside for extracurricular activities, however, the period dedicated to the practice of physical activity was gradually reduced^{1,2}. At the same time, there was an increase in the prevalence of cardiovascular risk factors, such as smoking, alcohol consumption, overweight and obesity³.

The use of alcohol by medical students, in particular, has been extensively studied. The abuse of this substance by undergraduates has been reported in different regions of the world, being more prevalent in men, although alcohol consumption by women has also increased substantially¹. It is believed that this increase in consumption is related to a form of stress relief caused by the student's routine and, often, serving as a mechanism that facilitates the use of tobacco and other narcotics².

Regarding smoking among medical students, a study demonstrated a reduction in consumption, with a lower prevalence of its use compared to the Brazilian population in general. However, these results must be interpreted with caution, as despite the reduction in tobacco use, the frequency of its consumption still remains high among students³.

Evidences show considerable frequency of self-medication among students of all levels of medical graduation, with an increase in consumption during the last years of training⁴. Among the drugs consumed, the most common are drugs with stimulating effects on the central nervous system and anxiolytics⁵. Regarding to illicit drugs, the consumption is more prevalent among young people, with great expressiveness in the university community, and particularly among medical students⁴. The most used substances are marijuana and cocaine, respectively⁶.

It is believed that, as in the general population, physical activity may be beneficial to improve the quality of life and reduce stressors in medical students. However, few studies are known showing the prevalence of physical activity and its favorable impact on medical students^{7,8}.

Despite the bad habits acquired by medical students during their graduation, it is believed that the practice of regular physical activity can favorably affect both their

quality of life and their cardiovascular assessment. In this context, the objective of this study was to know the clinical profile, cardiovascular factors, depressive profile and the presence of rhythm disorders in medical students from the Federal University of São Carlos (UFSCar), as well as to compare the cardiac assessment and quality of life of inactive and active students.

METHODS

A descriptive, cross-sectional and quantitative study was carried out among undergraduate medical students from UFSCar. Data collection and electrocardiographic examination were performed by research students and the responsible supervisor in the Laboratory 3 of the Department of Medicine of UFSCar, during 2018.

The research proponents approached students from all undergraduate years in their classroom more than once, explained the research proposal and delivered the questionnaire and the consent form for all students to fill out, without exclusion criteria. Those who agreed to participate in the research and completed the questionnaires were considered included.

All participants included in the study were in agreement with the study, evidenced by signing the Free and Informed Consent Form (FICF). This study was approved by the Research Ethics Committee (CAAE: 49651815.8.0000.5504) of the Federal University of São Carlos.

The clinical evaluation was performed, considering the following variables: age, body mass, height and body mass index, skin color, gender, presence of cardiovascular risk factors (Diabetes Mellitus, Systemic Arterial Hypertension, smoking, obesity), use of illicit drugs and level of physical activity.

The assessment of students' degree of depression was performed using the Beck scale⁹.

The degree of sedentary lifestyle was assessed using the IPAQ form (International Physical Activity Questionnaire)¹⁰. Students were asked about the intensity (mild, moderate and intense) and weekly frequency (how many days) of the exercise performed for more than 10 minutes without interruption. The type of exercise performed and the duration in minutes of physical activity per day were also considered in the questionnaire. According to the IPAQ results, students were classified as inactive (sedentary) and active (irregularly active, active or very active). In addition, the classification of the AHA (American Heart Association)¹¹ was also considered in the assessment of the degree of sedentary lifestyle. According to the AHA, students who engaged in physical activity for 150 minutes or more per week were considered active.

The students included in the study were also

submitted to an electrocardiogram. The interpretation of the electrocardiographic results was performed in accordance with the 2003 Guidelines for the Interpretation of Electrocardiograms from the Brazilian Cardiology Society¹².

Statistical analysis considered mean, standard deviation, absolute frequency (n) and relative frequency (%). Shapiro-Wilk normality test was applied. Considering most variables with normal distribution, the Chi-Square test was performed to analyze categorical variables and the T test to compare the Inactive (I) and Active (A) groups, considering a significance level of 5%.

RESULTS

A total of 240 students were considered eligible for the study, and 85 students answered the questionnaires, distributed in all years of the medical school from UFSCar, for a response rate of 35.4%. Of the total sample, 72.9% of students (n = 62) indicated which year they were attending, of which 2.3% of students were in the first year (n = 2), 4.7% were in the second year (n = 4), 9.4% in the third year (n = 8), 11.7% in the fourth year (n = 10), 23.5% in the fifth year (n = 20) and 21.3% in the sixth year (n = 18). Of these students, women represented 55.3% (n = 47) and men 44.7% (n = 38). Any student enrolled in the year 2018 in the medical school, regardless of the presence of comorbidities and current health status, could be considered in the survey.

Regarding the total number of research participants (n=85), 47 were women (55.3%) and 38 were men (44.7%). The mean age was 24 years, mean body mass of 67 kg, mean height of 1.7 m, and mean BMI of 23 kg/m², as shown in Table 1.

Table 1. Anthropometric data of UFSCar medical students (n=85).

	Total (mean)	SD
Age (years)	24	3,81
Body Mass (kg)	67	14,98
Height (m)	1,7	0,09
BMI (kg/m ²)	23	4,00

BMI – Body Mass index

Source: the authors.

Considering the students interviewed, as shown in Table 2, only 1 reported Diabetes mellitus, 3 students reported systemic arterial hypertension, 5 students were classified as obese by BMI, 5 reported being smokers, and 6 reported a diagnosis of depression.

Table 2. Prevalence of cardiovascular risk factor among medical students from UFSCar (n=85).

	n	%
Diabetes mellitus	1	1,2
Sistemic Arterial Hypertension	3	3,5
Obesity	5	5,9
Smoking	5	5,9
No risk factor	71	83,5

Source: the authors

The use of antidepressant medications was found in 8 students. The use of legal drugs was reported by 34 students (40% of the total), with alcohol being the only substance identified. Regarding the use of illicit drugs, three substances were identified. Of the 8 students who reported using illicit drugs (9.4% of the total), 7 reported using marijuana, 1 reported using cocaine, and 2 reported using LSD.

The frequency of the use of legal and illegal drugs is shown in Table 3: 52 students never used the substances during the week, 24 students used it once a week, 6 students used it twice a week, 1 student used it three times a week and 1 student used it five times a week. One student did not respond to this section.

Table 3. Frequency of use of legal and illegal drugs by medical students from UFSCar (n=85).

	n	%
Never in the week	52	61,2
Once a week	24	28,2
Twice a week	6	7,0
3 times a week	1	1,2
5 times a week	1	1,2
Not informed	1	1,2

Source: the authors

Regarding the result of the Beck Depression Scale, 68 students didn't show depression, 10 students had mild depression, 6 students had moderate depression and no student had severe depression.

Table 4 shows the main findings on the electrocardiograms of the 43 students who attended on the day scheduled for the exam: 22 had some findings, such as left atrial overload (n = 8), early repolarization (n = 4) and right bundle branch conduction disorder (n = 10).

Table 4. Electrocardiogram from UFSCar's medical students (n=43).

	n	%
Left atrial overload	8	18,6
Early repolarization	4	9,3
Incomplete right bundle branch conduction disorder	10	23,3
No change	21	48,8

Source: the authors

Regarding the analysis of physical activity level according to the American Heart Association (AHA), 81 students answered this section. Of these, 41 (51%) were classified as active and 40 (49%) as inactive¹³.

As shown in Table 5, the average age among the inactive, according to the AHA classification, was 24 and among the active 23. Among the inactive, the mean body mass was 66 kg and among the active was 69 kg. The BMI in the active group was 23 kg/m² and in the inactive group 22 kg/m². There was no significant difference in age, weight, BMI and sex between the active and inactive groups.

Table 5. Comparison of anthropometric data between active and inactive medical students from UFSCar.

Variables	Active		Inactive	
	Mean	SD	Mean	SD
Age (years)	23	4	24	3
Body mass (kg)	69	14	66	15
BMI (kg/m²)	23	4	22	4

BMI – Body mass index

Source: the authors

Considering the clinical variables, depression, use of antidepressant medications, Beck score, alcohol use, drug use (legal and/or illegal), there was no significant difference between the groups of active and inactive students.

Between smokers and those who use marijuana, there was a significant difference between the active and inactive groups, with 100% of smokers and 85.7% of marijuana users considered active.

Regarding the 85 students who participated in the survey, only 58 rated their graduation year. Among students who were classified as inactive, the distribution in years of medical training were: 1 student in the first year, 1 in the second year, 3 in the third year, 1 in the fourth year, 9 in the fifth year and 14 in the sixth year. The percentages for

each year are shown in Table 6. A higher level of inactivity was noted among students in the last year of graduation.

Table 6. Distribution of active and inactive students per year of the undergraduate medical school at UFSCar.

	Active	Inactive	Total
1° Year	1/50%	1/50%	2
2° Year	2/67%	1/33%	3
3° Year	4/58%	3/42%	7
4° Year	9/90%	1/10%	10
5° Year	10/52%	9/48%	19
6° Year	3/18%	14/82%	17

Source: the authors

The analysis of the electrocardiogram showed no difference in the findings presented between active and inactive students.

DISCUSSION

The primary objective of this study was to compare the main cardiovascular health findings of active and inactive medical students with existing behavioral habits. The sample studied showed a uniform distribution of age groups, with no male or female predominance.

Regarding cardiovascular risk factors, there was a low prevalence of hypertension, diabetes mellitus and obesity among medical students. Interestingly, mental health conditions such as depressive symptoms were more frequent than organic diseases. As pointed out by other studies^{13,14}, it can be explained by the age group of the studied sample, in which a low prevalence of cardiovascular diseases is expected. Regarding the mood disorders, according to the study by Santos et al.¹³ and Chehuen et al.¹⁵, the competency-based curriculum can cause a high stress load, demands and self-demands that can be triggers for diseases such as depression. The results in relation to mental health are also in agreement with those described by Machado et al.² and Noronha Jr. et al.¹⁶. These authors correlate the greater appearance of depression and substance abuse to emotional and social factors, in addition to fear of failure, parental demands and the job market demands. In according with it is expected of a competency-based curriculum¹⁷, it is worth noting that the UFSCar medical school has an innovative and active methodology and that it can also be associated, especially in the first years of the course, with insecurity in learning and fear of the new format. Contradictory, some studies have not shown that differences between teaching methodologies can influence the behavior and life habits of students in the health area^{8,18,19}.

Regarding tobacco use, there was a low prevalence of smokers, totaling 5% of the analyzed sample. This result corroborates the study by Silveira et al.²⁰, who observed a reduction in tobacco use by medical students in the last ten years. It is interesting to note that there was a significant association ($p=0.021$) between smokers and active students, according to AHA, with no differences of gender. These findings may be related to the fact that students who practice physical activity are more sociable and attending more university meetings, where exposure to tobacco is greater. A study³ showed a high prevalence of 10% smoking among medical students, with the main factors related to tobacco use being male gender and the first years of graduation.

In the present study, there was a significant association between marijuana use and physical activity. A literature review²¹ pointed out that the main factors associated with the use of illicit drugs are: college parties, curriculum activities, excessive workload, self-reproach and greater intake of these substances after taking tests to relieve stress. The most prevalent drugs among university students in the health area are: firstly, alcohol, followed by tobacco use and then marijuana. The prevalence of cocaine use was more prevalent among medical students compared to the general population of the same age group. Vieira et al.²², on the other hand, evaluated in a recent study that leisure deprivation may be related to greater consumption of illicit drugs and alcohol abuse among health care students.

Regarding physical activity practiced by students, there was no significant difference between active and inactive according to the AHA classification. It is worth noting that a higher frequency of inactive students was found in the last year of graduation compared to the first years of the course. This, in agreement with a previous study²³, may reflect the greater burden of responsibilities and hospital internships, in the last two years of the course, reflecting less time for physical activity. In a study carried out with 120 students at UNIFENAS², a decrease in physical activity practice was noted over the six years of medical graduation. Maia et al.²⁴ pointed out that, although medical students have the perception that their quality of

life substantially improves with the practice of physical activity, most are not adept at this practice. Factors related to study hours may be related to non-adherence to regular physical activity. Regarding university students in general, the study by Vargas et al.²⁵ showed a high prevalence of inactive students, and the main factors related to longer physical activity per week were male gender, single marital status and being students of physical education. These findings point the need for programs that encourage the practice of exercise, reinforcing its benefits and providing time and scenarios for its encouragement.

Regarding the cardiac evaluation and interpretation of the electrocardiogram, the findings are not related to any other factors investigated in the research and without any clinical relevance. Similar results were found in other studies^{26,27}, and in relation to cardiovascular risk factors in medical students, the most prevalent findings in these studies were sedentary lifestyle, stress and obesity, without other changes in complementary exams.

The main limitation of this study was the sample size. In relation to the 240 students of the UFSCar Medical School, only 85 participated in the survey, that is, only 35.4% of the students. The distribution between undergraduate years was also uneven, with greater participation from the last years (5th and 6th years). Despite these limitations, the study allowed us to know the profile of the students, existing lifestyle habits during the course's progression and the relationship with the practice of physical exercise.

CONCLUSION

The last year of the medical school from UFSCar has a higher prevalence of inactive students, when compared to the early years. In this division, a greater predominance of tobacco and illicit drug use was noted among students considered active. Regarding the analysis of risk factors and electrocardiographic findings, this study found no difference in relation to active and inactive students.

Acknowledgments: To the National Council for Scientific and Technological Development (CNPq) for the research initiation grant from UFSCar.

Development agency: CNPq – National Council for Scientific and Technological Development.

Author contributions: Paula Tiemi Fujioka, Vanessa Tieko Nagaoka, Ingo Latzina Heinritz - data collection, data tabulation; Lana Kummer - data tabulation and manuscript writing, English revision; Getúlio Pinheiro Lopes Ferraz - data tabulation, drawing of figures; Meliza Goi Roscani - advisor, electrocardiogram report, project idealization and manuscript review.

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Submitted:

Accepted: