

Original Article

Evaluation of obesogenic habits of medical students: analysis of nutritional, physical and anxiety and depression status among students at a private university in Rio de Janeiro*Avaliação de hábitos obesogênicos em estudantes de medicina: análise do estado nutricional, físico, de ansiedade e depressão entre estudantes de uma faculdade privada do Rio de Janeiro*

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Porto PLG, Neves Neto RG, Guedes DC, Lima YM, Assef T, Souza RHR, Taboada G Evaluation of obesogenic habits in medicine students: analysis of nutritional, physical, anxiety and depression status among students at a private university in Rio de Janeiro / *Avaliação de hábitos obesogênicos em estudantes de medicina: análise do estado nutricional, físico, de ansiedade e depressão entre estudantes de uma faculdade privada do Rio de Janeiro*. Rev Med (São Paulo). 2022 March-April;101(2):e-189904.

ABSTRACT: Obesity is a chronic condition characterized by excessive fat accumulation that presents a risk to health. The graduation can affect the student's life, which may lead to changes in habits and psychosocial alterations, contributing to the development of obesity and other comorbidities. Consequently, the present study evaluated the nutritional, physical and anxiety and depression status of students from the Medical School of Universidade Estácio de Sá, RJ, conducting a cross-sectional observational clinical study through the application of a questionnaire with 27 items. The median BMI in the first semester was 22 Kg/m² and was higher in the other semesters, with a median of 23.1 Kg/m². There was no change in the BMI in the basic cycle. The median BMI was higher among men, but the total score of anxiety and depression questions was higher among women and in the clinical cycle. There was also a weak positive correlation between the variation of weight in men and the score of anxiety and depression question. The same correlation was considered insignificant for women. No relevant obesogenic habits were observed in the students. Therefore, it is relevant to consider the importance of a healthy diet, physical activity and attention to mental health. In addition, future studies with longitudinal

evaluation should be conducted to better assess the weight and habits of students throughout the course.

Keywords: Obesity; Students, medical; Body mass index; Obesogenic habits.

RESUMO: A obesidade é uma condição crônica caracterizada pelo acúmulo excessivo de gordura, repercutindo negativamente na saúde do indivíduo. A graduação pode impactar na vida do estudante, refletindo em mudança de hábitos e alterações psicossociais, contribuindo para o desenvolvimento de obesidade e outras comorbidades. Assim sendo, o presente trabalho avaliou o estado nutricional, físico e de ansiedade e depressão entre os alunos da Faculdade de Medicina da Universidade Estácio de Sá, RJ, por meio de um estudo clínico observacional de corte transversal pela aplicação de questionário composto por 27 itens. A mediana do IMC no 1º período foi 22 Kg/m², sendo maior que o IMC nos períodos acima, de 23,1 Kg/m². Não houve variação do IMC no ciclo básico. As medianas de IMC foram maiores nos homens, porém o somatório dos itens de ansiedade e depressão foram maiores tanto em mulheres quanto no ciclo clínico. Houve

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fraca correlação positiva entre a variação de peso nos homens e o somatório dos itens de ansiedade e depressão. Esse, porém, foi considerado insignificante para as mulheres. Não se observou hábitos obesogênicos relevantes nos estudantes. Portanto, é notável considerar a importância de uma alimentação saudável, prática de atividade física e atenção à saúde mental, bem como

INTRODUCTION

The World Health Organization (WHO) defines obesity as a chronic condition characterized by excessive fat accumulation that presents a risk to health. In the International Classification of Diseases (ICD-10), obesity is categorized under endocrine, nutritional and metabolic diseases. Despite its limitations, the Body Mass Index is a low-cost and easy-to-use method to diagnose obesity [BMI = weight in kilograms / height in meters squared]¹. The etiology and pathogenesis of obesity involve genetic predisposition and environmental factors, such as sedentarism, eating habits and lifestyle², which can result in an imbalance between energy intake and energy expenditure.

Medical school has a significant impact on the lives of students, causing changes in eating and physical activity habits³. In addition, this phase is also characterized by study overload, reduction of leisure time, self-pressure for excellence and the need to learn to deal with illness and death, which can contribute to the high prevalence of anxiety and depression among medical students⁴. All these factors can influence the development of overweight and obesity throughout the course, in addition to other comorbidities that can increase cardiovascular risk⁵.

Thus, the present study aims to evaluate eating habits and physical activity and to carry out a simplified screening for anxiety and depression among students at the Medical School of the *Universidade Estácio de Sá* (UNESA), *Campus Presidente Vargas*.

MATERIALS AND METHODS

Study design and ethical considerations

This is a cross-sectional observational clinical study. The project was approved by the Research Ethics Committee of UNESA under the number CAEE: 09557119.6.000.5284 on April 3, 2020.

Study population

From April 9 to May 4, 2020, the link to the online survey questionnaire was sent by email and WhatsApp to class representatives from all periods of the UNESA Medical School, *campus Presidente Vargas*, for sharing

a realização de futuros estudos de desenho longitudinal com a proposta de melhor avaliar o peso e os hábitos dos estudantes no curso.

Descritores: Obesidade; Estudantes de medicina; Índice de massa corporal; Hábitos obesogênicos.

with their respective classes. All students who agreed to participate and answer the questionnaire were included in the study.

Instrument

An online questionnaire was created using Google Forms. The questionnaire had 27 questions divided into four topics: demographic data, eating habits [inspired by the guide provided by the Ministry of Health⁶], physical exercise and questions adapted from the Hospital Anxiety and Depression Scale (HAD)⁷. Each question received a score from 0 to 4. Lower values are associated with answers that reveal healthier habits and higher values are associated with less healthy habits. Most questions used a four-choice Likert scale for responses: never; rarely; many times; and always. The higher the final score on the questionnaire, the more obesogenic the habits of the student. Questions 1 to 6 and 18 do not count points as they refer to the characterization of the sample (age; current period; gender; weight; height; weight in M1) and the type of physical activity performed. The maximum value of the questionnaire is 62 points, with a maximum of 31 points in questions about eating habits, 13 points in questions about physical exercise and 18 points in questions about anxiety and depression.

The Informed Consent Term (TCLE) was attached to the beginning of the online form and presented for the student to accept before filling the form. It was considered accepted when the box agreeing with the TCLE was checked and the answers were sent.

Statistical Analysis

The information collected was tabulated in a file in Microsoft Excel version 2010 and the analysis was performed using the SPSS 23.0 statistical software for Windows (SPSS, Inc., Chicago, IL). The Kolmogorov-Smirnov test was used to assess the normality of the numerical variables and showed that all variables had an asymmetrical distribution. Thus, numerical data were presented as median (p25-p75) or absolute number (percentage). The Mann Whitney test was used for comparison between groups. Fisher's exact test was used for comparison of categorical variables between groups. Spearman's correlation coefficient was used to study the relationship between the numerical variables.

RESULTS

A total of 178 questionnaires were included, of which 74.2% (n=132) were from women and 25.8% (n=46) were from men. As for period, the sample was composed of: 34 students from the 1st period (19.10%), 3 students from the 2nd period (1.69%), 9 students from the 3rd period (5.06%), 15 students from the 4th period (8.43%), 26 students from the 5th period (14.61%), 35 students from the 6th period (19.66%), 13 students from the 7th period (7.30%), 12 students from the 8th period (6.74%), 19 students from the 9th period (10.67%), 6 students from the 10th period (3.37%), 4 students from the 11th period (2.25%) and 2 students from the 12th period (1.12%). To better visualize the sample, students were divided into training cycles: the basic cycle is composed of students from the first to the third period; the clinical cycle goes from the fourth to the eighth period; and the professional cycle is formed by the last four periods. The study included 46 students (25.84%) from the basic cycle, 101 students (56.74%) from the clinical cycle and 31 students (17.42%) from the professional cycle.

The median age was 22.5 years (21-25), the median BMI in the 1st period of college was 22.0 kg/m² (20.3-25.2)

and the current median BMI was 23.1 kg/m² (20.9-26.1).

The median of the total score of questions about diet and habits was 12 (9-16); for questions about physical activity, it was 5 (4-7) and for questions about anxiety and depression it was 7 (5-11). The median of the total score of the questionnaire was 26.5 (19.8-32).

Comparison between genders

There was no difference between genders in age, weight variation, total score in questions about diet and habits, total score in questions about physical activity or total score.

The median BMI in the 1st period was higher among men [24.3(22.3-26.2) *versus* 21.3 (19.9-24.2) Kg/m²; $p < 0.001$], as well as the current BMI [25.3 (23.4-27.5) *versus* 22.3 (20.3-24.7) Kg/m²; $p < 0.001$], Figures 1 and 2.

On the other hand, the score of anxiety and depression screening questions was higher among women [9 (6-12) *versus* 6 (4-7); $p < 0.001$], as illustrated in Figure 3.

There was a weak positive correlation between men's weight variation and anxiety and depression scores ($r = 0.389$, $p = 0.034$). This correlation was insignificant for women ($r = 0.210$; $p = 0.053$).

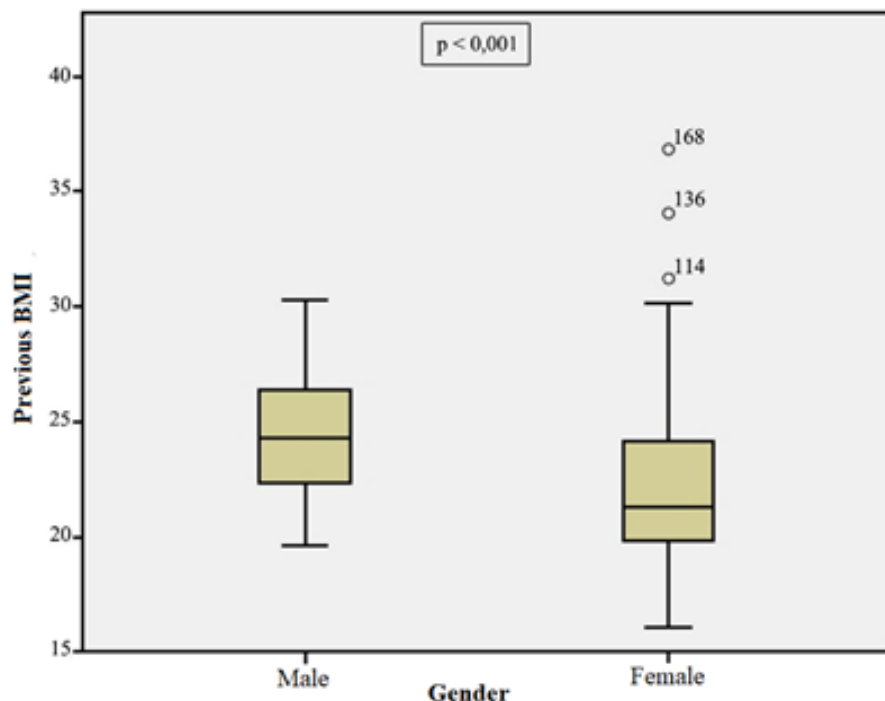


Figure 1. Comparison between BMI in the 1st period and gender.

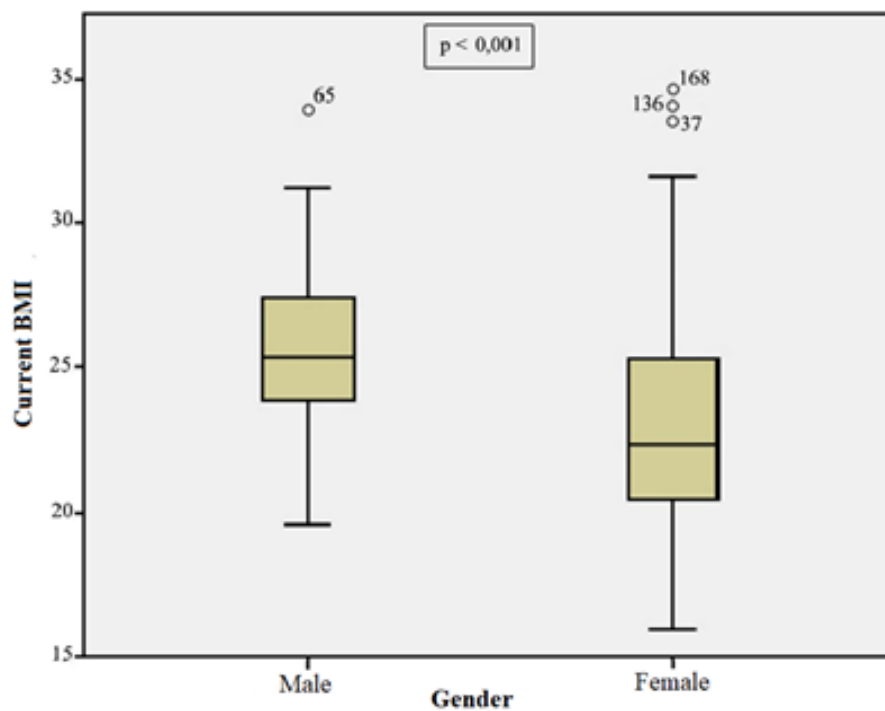


Figure 2. Comparison between current BMI and gender.

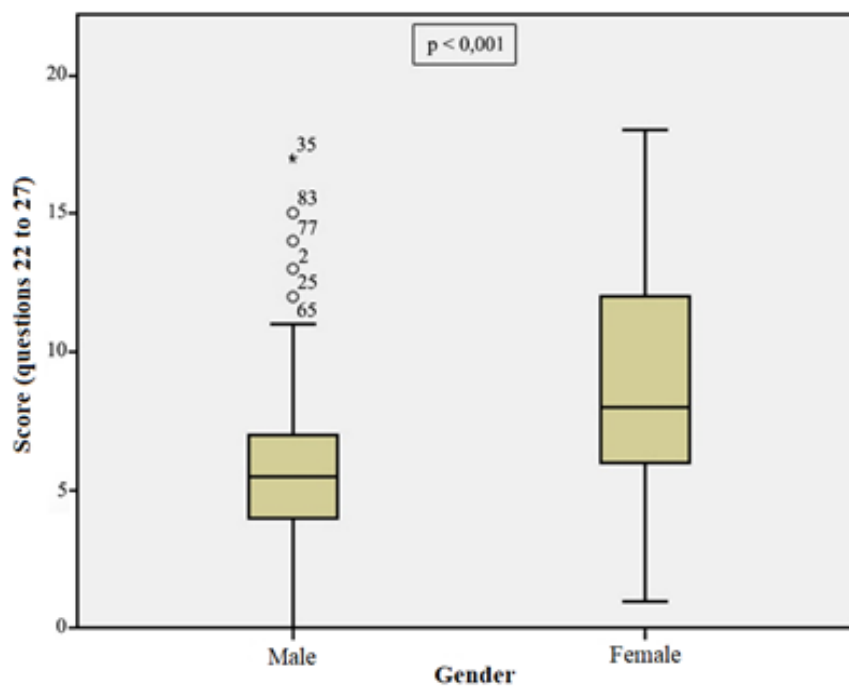


Figure 3. Comparison between the score of questions about diet and habits and gender.

Comparison between the basic, clinical and professional cycles

There was no difference in current BMI, in the score of questions about diet and habits, or in the score of questions about physical activity in the three cycles of college, as illustrated in Figure 4.

Age was lower in the basic cycle, with a median of 21 years [21(19-24) versus clinical 23 (21-25) versus

professional 23 (22-25) years; $p=0.001$] and the BMI in the 1st period was higher than in the other cycles, with a median of 23.8, followed by 21.5 [23.8 (21.1-26.1) versus 21.5 (20.1-24.3) versus 21.7 (20.5-23.8) Kg/m^2 ; $p=0.028$].

There was no variation in BMI in the basic cycle, but it was present in the other two cycles [0 versus 5.2 (0-12.2) versus 4.6 (-1.5-10,2) %; $p<0.001$].

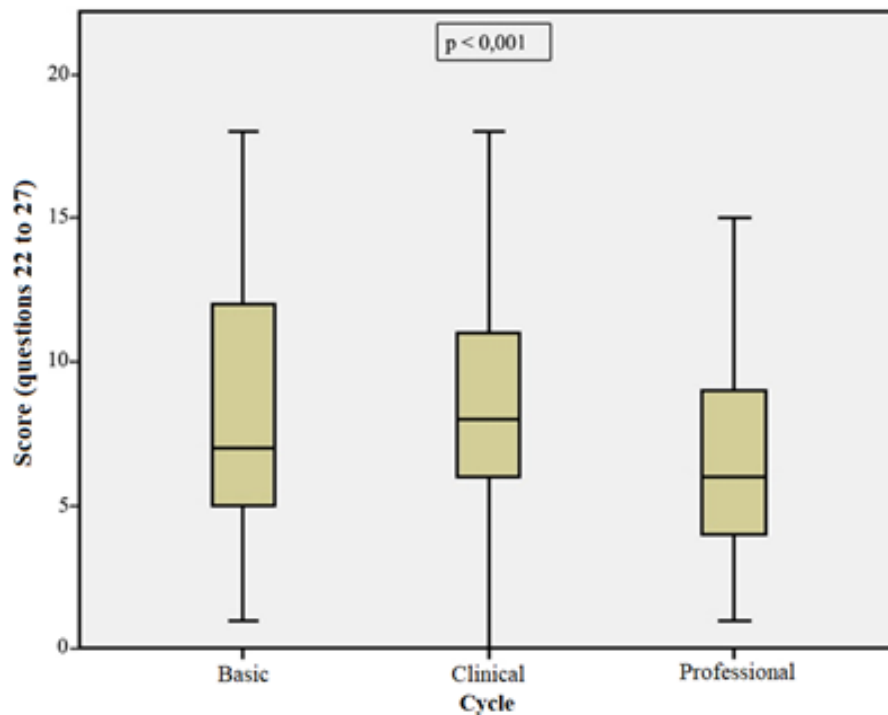


Figure 4. Comparison between student's scores on anxiety and depression screening questions and the cycle.

The total score of anxiety and depression screening questions was higher in the clinical cycle when compared to the other two cycles [7(5-12) *versus* 8.5 (6-12) *versus* 6(4-10.3) for basic, clinical and professional, respectively;

$p=0.038$]. The total score of the questionnaire was lower in the professional cycle [27(20-32) *versus* 27(21-34) *versus* 21(18-27) basic, clinical and professional, respectively; $p=0.019$], as illustrated in Figure 5.

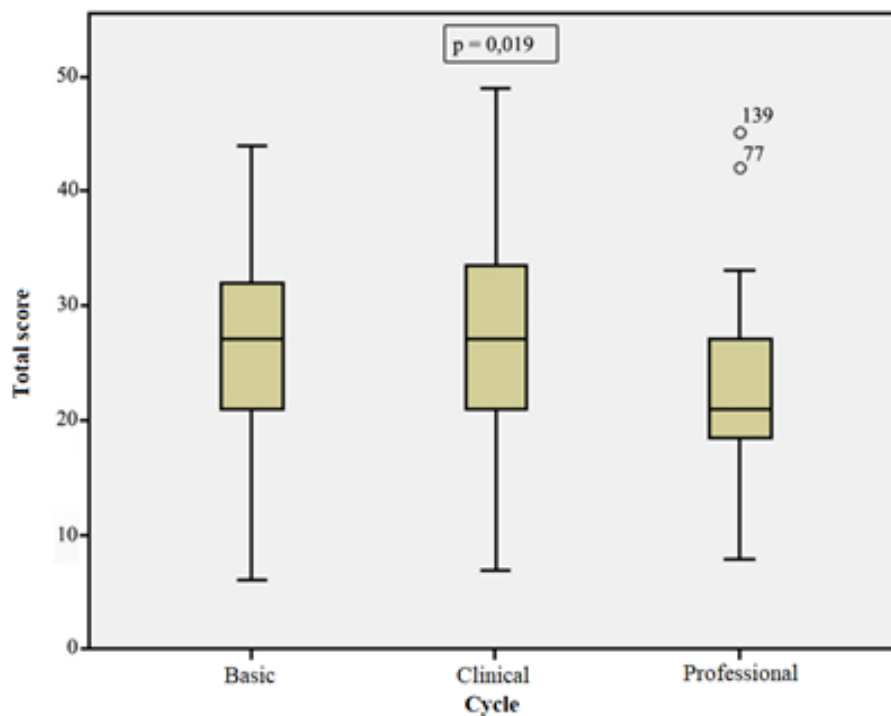


Figure 5. Comparison between the total score of students and the cycle.

There was an insignificant correlation between weight variation and age ($r = 0.17$; $p = 0.041$); score of anxiety and depression screening questions ($r = 0.23$; $p = 0.007$); and the total score of the questionnaire ($r = 0.22$; $p = 0.01$).

DISCUSSION

The study population showed a significant disparity between the number of women and men. The sample was mostly composed of women (74.2%), with a percentage 10% higher than that found in research carried out in other medical schools in the state of Rio de Janeiro^{8,9,10}. The growth of female participation in medicine is already a well-established fact. The number of graduated female doctors has been increasing each year since 1980¹¹, but the disparity between genders in this study was more pronounced than in the literature, which may be an indication of sampling bias. The use of a link to apply the questionnaire may have created a biased sample, because, as it was not randomized, the student population obtained may have been formed only by individuals who had a great desire to participate in the study, perhaps due to interest in the subjects included in the research, such as diet, physical exercise or mental disorders.

The median BMI among the students was 23.1 kg/m², showing a central tendency within the desirable range. In addition, the median score of the three parts of the questionnaire (diet, physical activity, anxiety and depression screening) was low, which was an unexpected result. The expectation of finding worse eating habits and a higher proportion of sedentary people among college students did not meet the reality. Again, this fact may reflect a sampling bias, as people who like to exercise and stay healthy may have been the ones that accepted to participate in the research¹².

The analysis of the data according to gender showed very interesting results. The total score of anxiety and depression screening questions was higher among women. However, this score was positively correlated with weight gain only in the group of men. The correlation between obesity and mood disorders is controversial, as there are as many studies that show an association between these diseases as studies that do not¹³. Thus, it is difficult to analyze this relationship, as two possible associations must be taken into account: depression or anxiety led the individual to become obese, or obesity and other variables led to depression. Bardagi and Brandtner's¹⁴ hypothesis is that men find it harder to talk about their feelings or address emotional issues, due to some kind of fear. Meanwhile, women are better at understanding and reflecting about what they feel. Corroborating this hypothesis, Millian and Arruda⁴ found that the psychological profile of male medical students is more emotionally immature and introspective and that these students have more trouble dealing with

their own subjectivity when compared to female students. In other words, the lower scores of men would represent this difficulty in identifying their own feelings, and the relationship with weight variation may be associated with an inadequate way of dealing with these disorders, making them seek temporary well-being through low-quality food instead of seeking medical, social, or family assistance. On the other hand, even women with higher scores would have the ability to better manage their disorders through coping strategies or by seeking professional or family help. Consequently, they would prevent that their emotional condition causes weight gain.

The analysis of the data according to the course cycle showed that the total score of anxiety and depression screening questions was higher in the clinical cycle than in the two others. This finding of the clinical cycle is in agreement with other studies, which found an increase in these disorders, especially depression, in the 3rd and 4th years of college¹⁵. Some of the factors that may be associated with this are the high level of competitiveness between the students for better academic performance, services, beginning of contact with critically ill patients in hospitals and longer study time due to the high demand in theoretical and practical disciplines¹⁵. However, it is worth noting that other studies found differences in the prevalence of these disorders during college periods. For example, a study by Rezende et al.¹⁶ identified a progressive increase in prevalence since the beginning of the course. Studies also found a slight increase in depression and anxiety at the end of the course, probably due to concerns associated with the labor market and residency tests and frustrations associated with training^{15,16}.

There was no difference in the current BMI between the basic, clinical and professional cycles. However, there was a variation in BMI (in relation to the BMI on admission to college) in the clinical and professional cycles. This suggests that, in fact, there was an increase in weight during college, even though the increase was small, and the median BMI remained within the normal range in the three cycles. This increase in weight may be related to changes in the student's lifestyle as, when entering college, the workload of the course can make it difficult to keep their daily physical activities and usual diet¹⁷. However, in this study, there was no difference in the total score of questions about diet and physical exercise between the three cycles. The variation in BMI in the clinical and professional cycle is associated with the scores of anxiety and depression questions, which is illustrated by the correlation found between these two variables (variation in BMI and score of the anxiety and depression questionnaire). A possible explanation for the lack of correlation between the variation in BMI and the physical exercise questionnaire in our study may be the calculation of the BMI, which only considers the individual's weight

and height parameters. BMI does not provide information on the distribution of body fat and the ratio between lean mass and fat mass of each individual. People who perform physical activities that tend to increase lean mass, such as weightlifting, may gain weight due to muscle hypertrophy and not necessarily due to an increase in fat mass. It is also worth remembering that there are differences in BMI between the genders, as men tend to have a higher BMI when compared to women. This difference was found in this study, both in the beginning of college and in the current period^{2,8,18}. Other studies carried out with the general population or medical students show this difference, which also occurs because of the different proportions of mass^{10,18}. Lean and fat mass are associated with multiple variables such as physical exercise, eating habits, metabolism and hormones. However, even with these limitations, the BMI showed a strong correlation with the percentage of fat when compared with bioelectrical impedance analysis¹⁸. The ideal is to associate BMI with other anthropometric measures, such as waist circumference, to improve its sensitivity in the identification of obesity¹⁹. However, the method used in this study, with collection of data through a questionnaire, did not intend to study body composition, but only to assess BMI based on information provided by research participants.

One of the limitations of this study is that, as it was a cross-sectional study, it was not possible to analyze if there was a variation in the students' obesogenic habits throughout the course or how their weight changed during each period. This means that current habits may not be the same as in the past and, therefore, may not be consistent with weight gain or loss since the 1st period until the most recent period. The student may have also found it

hard to remember their exact weight in the first semester and, therefore, may have given wrong data, which would make it difficult to accurately analyze the correlations. A lower BMI in the 1st period of veterans when compared to the BMI of freshmen can be an example of inaccurate information in the data.

CONCLUSION

The BMI of students from the Medical School of the *Universidade Estácio de Sá* who agreed to participate in the present study was within the normal range, revealing that, globally, these students have a healthy BMI. Furthermore, the presence of relevant obesogenic habits (diet and physical activity) was not observed in the answers to the questionnaires used for the research. These results were different from what was expected, since it is known that the college period can have negative effects on the students' eating habits and frequency of physical activity. Anxiety and depression were more frequent among women and in the group of students in the clinical cycle. Finally, the variation in BMI (weight gain) was not correlated with dietary habits or physical exercise questionnaires, but was positively associated with the total score of the anxiety and depression questionnaire, especially among men.

Thus, it is worth highlighting the importance of having good eating habits and caring not only for physical health, but also for the mental health of medical students. Future research could assess the BMI and obesogenic habits of students with a longitudinal design, in order to better explore the evolution of weight and habits throughout the course.

Author's participation: *Paula Lima Guimarães Porto* – elaboration of the questionnaire and online publication, data collection and analysis, review of the final text. *René Garrido Neves Neto* - data collection and analysis, discussion, review of the final text. *Débora Cunha Guedes* - data collection, discussion, development of theoretical bibliographic content. *Yasmin Moraes Lima* - elaboration of the questionnaire, elaboration of theoretical bibliographic content. *Thiago Assef Gomes* - research and development of theoretical bibliographic content. *Rafael Henrique Rodrigues de Souza* - research and development of theoretical bibliographic content. *Giselle Taboada* – advisor, data analysis, final review of the text.

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