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PHYSICAL ACTIVITY LEVEL AND NUTRITIONAL STATUS IN BRAZILIAN UNIVERSITY STUDENTS

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ABSTRACT

Objective: The purpose of this study was comparing the physical activity level (PAL) and nutritional status between freshmen and seniors students from Physical Education Course of a university in the State of Bahia, Brazil. **Materials and Methods:** The sample was selected for convenience, being 41 students (53% male) with a mean age of 22.31 (4.20) years. The subjects were divided into 4 groups, according to gender and course stage: Male Freshmen Group (MG1) and Male Veterans Group (MG8); Female Freshmen Group (FG1) and Female Veterans Group (FG8). The IPAQ short version was used to measuring the PAL. The nutritional status was estimated using the Body Mass Index (BMI). The continuous variables were compared with the independent student t-test, as well as the ordinations with the U-test. The level of significance was $p < 0.05$. **Results:** The PAL values were statistically different between the MG1 and MG8 groups, where MG1 was classified with a higher PAL ($U = 21.00, p = 0.01$). The same did not occur between the FG1 and FG8 groups. There was a statistically significant difference between the BMI means of MG1 and MG8 ($t(19) -2,34, p = 0.03$), favorable to MG1. For the FG1 and FG8 groups, the statistically significant difference was not found between the BMI means ($t(18) -0,91, p = 3.87$). **Conclusions:** It was concluded male students had better results in PAL and BMI. For females, there were no changes in the level of physical activity and body mass index, according to the moment of the course.

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INTRODUCTION

The increased working hours, the difficult systematization of studies and the lack of company can be barriers to an adequate behavior regarding the regular practice of physical exercise and the good nutrition in university students (Nascimento, Alves, and Souza 2017), factors that can aid in the process of etiology of the obesity and low physical activity level (PAL) (Pinheiro, Freitas, and Corso 2004; Wanderley and Ferreira 2010) situations that are directly related to increased cardiovascular risk (Carlucci et al., 2013). In this sense, VIGITEL shows that in Brazil, between 2006 and 2016, there was an approximate increase in the frequency of overweight adults, in the order of 1.21% per year, whereas, considering obesity, the occurrence was 0.73% per year (IBGE, 2017).

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Regarding the frequency of physical inactivity for Brazilian adults, it is indicated that the increase was from 41.1% in 2002 to 54.4% in 2012 (Hallal et al. 2014). In view of the different groups in which this problem has been studied, it is possible to highlight studies aimed at identifying the prevalence of overweight and low PAL among university students (Carvalho et al. 2015; Cruz et al. 2015; Pires et al. 2013), mainly due to the observed nutritional changes and decreased levels of physical activity in several groups (Katzmarzyk and Mason 2009). Another point to be observed refers to the variation of body mass and relative adiposity in university students throughout the academic semesters, observed from the nutritional status, being verified changes in these variables during the graduation period (Fedewa et al., 2014). Likewise, although the recommendations indicate that the subject should remain active as a form of health promotion and disease prevention (De Onis et al., 2007; World Health Organization 2010), the prevalence of low PAL in university students seems

to vary between studies (Cruz *et al.*, 2015; Mendes *et al.*, 2016; Petribu, Cabral, and Arruda 2009), suggesting to present alterations throughout the graduation period (Jung, Bray, and Ginis 2008). Thus, considering the information presented, it is important to identify the behavior of the university student regarding nutritional status and PAL, as well as possible differences between the first and last semesters, favoring actions in which these variables can be considered. In this sense, the objective of this study was to compare the PAL and the prevalence of nutritional status in freshmen and seniors students of Physical Education Course from a the Public University of the State of Bahia, Brazil.

MATERIALS AND METHODS

It is a cross-sectional study conducted between June and August 2017, with a sample selected for convenience, of which 41 students (53% male, mean 22.32 years and range of 18-35 years), enrolled in the first and last semester of the Physical Education Course. The individuals were divided into four groups: Male Freshmen Group (n = 9) (MG1) and Male Senior Group (n = 12) (MG8); Female Freshmen Group (n = 10) (FG1) and Female Senior Group (n = 10) (FG8). The following inclusion criteria were considered: students duly enrolled in the first and last semester of the undergraduate Physical Education Course. Exclusion criteria were considered individuals with some physical limitation that could impede the performance of the anthropometric tests. The present study was approved by the Research Ethics Committee of Faculdade Nobre (CAAE: 68975317.6.0000.5654). All the volunteers signed the informed consent form, as directed by Resolution 466/12 of the Ministry of Health. The PAL assessment was performed based on the evaluation of the results of the application of the International Physical Activity Questionnaire (IPAQ), short version, validated in Brazil in 2001 (Matsudo *et al.*, 2001). The application of the IPAQ followed the recommendations contained in the validation study of the instrument (Matsudo *et al.*, 2001), where the score of each individual has used the sum of the number of days and minutes or hours of physical activity practice reported per week. For this, the recommendations of the IPAQ were used, where the individuals were classified as: "Sedentary", "Insufficiently active B"; "Insufficiently active A", "Active"; "Very active" (Matsudo *et al.*, 2001). To measure body mass, an anthropometric scale with a 100g scale was used (Alvarez and Pavan, 2011). To determine the height, a tape measure (wall-mounted) with a scale of 1mm was used. The volunteers were advised to be barefoot, in an orthostatic position, looking forward with their head positioned from the alignment of the Frankfurt plane, as standardized by Alvarez and Pavan (2011). The results of measures of body mass and height were used to estimate the Body Mass Index (BMI) (Alvarez and Pavan, 2011). The classification of BMI was done according to WHO recommendations (World Health Organization 2000). The normality of the data was verified through the Shapiro-Wilk test. Therefore, to compare the means of the variables we used the t-student independent test, while the U Mann-Whitney test was used to compare the ordaining data (Thomas, Nelson, and Silverman 2009). The confidence interval adopted was 95%, and a significance level of 5%. Statistical analysis was performed with the SPSS, version 22.0.

RESULTS

This study included 41 subjects, being 19 "entering" and 22 "graduating". The characteristics of the sample can be seen in

Table 1. Groups MG1 and MG8 presented a prevalence of 11% and 67% of overweight, respectively. When comparing the means of BMI between these groups, a statistically significant difference was found ($t(19) -2,34, p = 0,03$). In the FG1 and FG8 groups, no overweight was found, nor was there a statistically significant difference between the means of BMI ($t(18) -0,91, p = 3,87$). Regarding the physical active level of MG1 and MG8, the U test revealed that there was a statistically significant difference ($U = 21,00; p = 0,01$), with MG1 being more active than MG8. In MG1, 67% of the individuals were classified as "Very Active" and 33% as "Active". While in MG8, 17% of the subjects were classified as "Very Active", 50% as "Active", 8% as "Insufficiently Active-A" and 25% as "Insufficient Active-B". (Figure 1A). Among the physical activity level of the FG1 and FG8 groups, no statistically significant difference was found ($U = 38,00, p = 0,30$). In FG1, 10% of the individuals were classified as "Very Active", 60% (6/10) "Active", 10% "Insufficiently Active-A", 10% "Insufficiently Active-B" and 10% "Sedentary". While in FG8, 20% of the subjects were classified as "Very Active", 70% as "Active" and 10% as "Sedentary" (Figure 1B).

Table 1. Characteristics of the sample and difference between the groups studied

	GM1 (n = 9)	GM8 (n = 12)
Variables	Mean (SD)	Mean (SD)
Age (years)	19,00 (1,00)	25,25 (4,03)
Body Mass (kg)	69,41 (9,17)	78,72 (11,50)
Height (m)	1,80 (0,06)	1,80 (0,07)
BMI (kg/m ²)	21,94 (1,94)	25,41 (4,09)*
Physical activity level	3,67 (0,50)	2,58 (1,08)*
	GF1 (n = 10)	GF8 (n = 10)
Variables	Mean (SD)	Mean (SD)
Age (years)	19,40 (1,58)	24,70 (4,16)
Body Mass (kg)	54,20 (7,63)	57,06 (6,59)
Height (m)	1,62 (0,08)	1,62 (0,06)
BMI (kg/m ²)	20,65 (2,8)	21,77 (2,7)
Physical activity level	2,50 (1,17)	2,90 (1,10)

BMI: Body Mass Index. SD: standard deviation. *: $p < 0,05$. GF: Female group. GM: Male group.

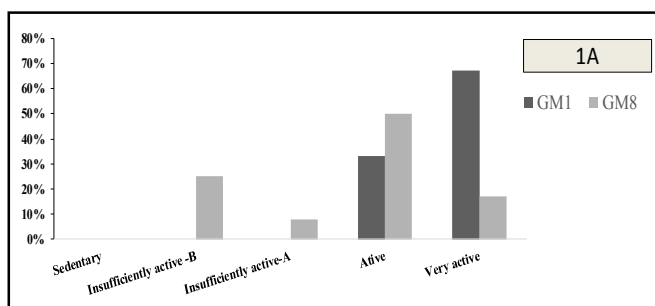


Figure 1A. Classification of the level of physical activity of the Male Group (MG1 and MG8)

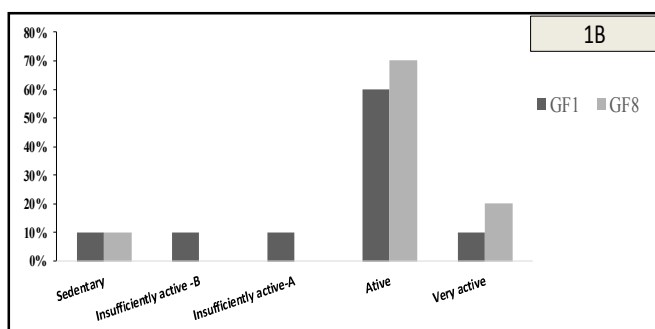


Figure 1B. Classification of the level of physical activity of the Female Group (FG1 and FG8)

DISCUSSION

In the present study, it is highlighted that the values of PAL and BMI were different between the MG1 and MG8 groups, where MG1 was classified with higher PAL and lower BMI. Between the FG1 and FG8 groups, there were no statistically significant differences for the PAL and BMI values. Comparison between MG1 and MG8 showed a statistically significant difference in PAL, with MG1 being more active. These findings contrast with a study conducted by Pires *et al.* (Pires *et al.*, 2013), where did not find a difference between the PAL of nursing students from different semesters. In addition, the prevalence of physically active subjects found in the present study was greater than the prevalence found by other investigations that used the short version of IPAQ (Cruz *et al.*, 2015; Mendes *et al.*, 2016). Apparently, these results follow the pattern of a study that pointed out that the higher the level of schooling, the lower the levels of physical activity, even in physical education courses (Bara Filho *et al.*, 2000). On the other hand, when considered the female groups, there is no difference between the freshmen and seniors. These results are in accordance with another paper that also used the short version of the IPAQ (Pires *et al.*, 2013).

An interesting fact is that the prevalence of the sedentary lifestyle of the present study, among females, was below that observed in the National Household Sample Survey (PNAD) (Knuth *et al.*, 2011) and the values found by a study done with university students (Martins *et al.*, 2010). When considering the group as a whole, it was verified that the male and female groups had higher PAL than those presented by studies done with university students (Cruz *et al.*, 2015; Martins *et al.*, 2010; Mendes *et al.*, 2016). This contrast can be explained by the specificity of the students of the evaluated course, who, in addition to performing the physical activity as part of the curriculum itself, still have information about the benefits of being physically active throughout life, which can be a determining the best results compared to other courses. In addition, the MG1 group presented higher PAL compared to MG8, and one of the factors that may explain this difference is the variation between the age groups of the groups. In this sense, Bauman *et al.* (2012) and Stochero and Ceni (2018) present the age as a factor inversely associated with PAL, that is, younger individuals seem to present higher PAL. The prevalence of overweight (overweight and obesity) was 11% and 67% for the MG1 and MG8, respectively. The low prevalence of overweight for MG1 was similar to that found by Silva (2011) and Cruz *et al.* (2015), however, the same trend was not observed for MG8, thus corroborating a meta-analysis study that points to the increase in body mass during the graduation period (Fedewa *et al.* 2014). In none of the FG1 and FG8 groups was the prevalence of overweight found. These values are below those found by a study by Silva with students from a university in the State of Santa Catarina and by Cruz *et al.*, with students from the State of Sergipe. In this sense, one of the factors that may explain the higher values of BMI for the MG8 group is the low prevalence of physically active individuals, considering that regular practice of physical activity assists in the maintenance of body mass (World Health Organization 2010). Therefore, overweight in university students can be explained by both eating habits and excessive consumption of fast food, as well as by the imbalance of daily caloric balance, derived from low energy expenditure in physical activities (Habib *et al.*, 2017). While the possible limitation of the study, it is verified the absence of students

from the other academic semesters, which would favor the visualization of a trend, which does not impair its internal validity of the study, given its specificity.

Conclusion

Based on the findings of this study, it was concluded that the male students had better results for PAL and BMI in relation to graduating. For females, there were no changes to the level of physical activity and nutritional status, according to the moment of the course. Thus, it is recommended that there be a follow-up of the behavior of variables such as PAL and overweight in university students, in order to maintain healthy habits during the graduation period.

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