



Evaluation of the physical activity level of undergraduation students of health/biology fields

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ABSTRACT

Background: Regular physical activity practice is considered an important factor in the population's health and quality of life promotion. In order to evaluate a population's physical activity level (PAL), many instruments are used, among them the IPAQ (International Physical Activity Questionnaire). **Objectives:** To evaluate the PAL of Physical Education (PE) undergraduate students concerning gender and study year as well as to compare the PAL of these students with others from different health/biology courses. **Methods:** Two hundred and eighty subjects; being 194 PE students (100 men and 94 women) and 86 students (17 men and 69 women) of other courses (Pharmacy; Biochemistry, Dentistry and Biology). The instrument used to measure the PAL was the IPAQ in its short version. **Results:** Among the PE students, it was found that 92% of them were classified as active or very active; however, there was no significant difference ($p > 0,05$) between male and female groups. Concerning the other courses, it was observed that the female sample is less physically active than the male one ($p < 0,05$). Considering the whole group in the category Active/Very Active, the Biology (86,9%) and PE students (90%) were classified as more active than the Biochemistry (56%) and Dentistry (61,1%) ones. However, there was no significant difference ($p > 0,05$). **Conclusions:** Generally, male students have a higher level of physical activity than female ones; the undergraduate students did not show similar patterns of PAL and this level remains constant during the PE course.

INTRODUCTION

Physical activity is considered among other factors an important element in health and life quality promotion of the population. Several studies demonstrate that sedentarism or lack of physical activity associated with smoking and inadequate diet are risk factors connected with lifestyle, which implies in a substantial increase in the risk of developing/increasing many diseases, especially the ones with chronic-degenerative nature, such as cardiopathies, cancer, hypertension, diabetes mellitus and obesity⁽¹⁻¹⁰⁾.

Currently, several instruments for evaluation of the physical activity level (PAL) of a given population are available. These methods may vary from electronic monitors (such as movement sen-

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sors) to surveys performed through questionnaires. The used electronic models are more accurate; nevertheless, more costly, which restricts their use to epidemiological studies. The use of questionnaires though, allows that a great part of the population is evaluated; however, they present lower precision⁽¹¹⁻¹³⁾.

Some works have been conducted with the purpose to validate these instruments for the evaluation of the PAL⁽¹⁴⁻¹⁶⁾. Among the used questionnaires, International Physical Activity Questionnaire – IPAQ, has been lately proposed as a possible model for standardization, allowing hence, the comparison of the results between studies performed in different countries. The use of the IPAQ showed positive results in several works using diverse populations⁽¹⁷⁻²¹⁾.

Despite the IPAQ advantages and the range of populations evaluated, such as children and adolescents^(20,22), young adults⁽²³⁾ and older individuals⁽²⁴⁾, the current PAL of the academic population (undergraduate and graduate) who represents an important group of the society has not been properly evaluated. Among the few studies in this population, Bara Filho *et al.*⁽¹⁾ analyzed the regular practice of physical activity through questionnaires applied to undergraduate and Master's students of Physical Education and verified that physical activity is not a routine in most of these professionals. Nevertheless, in the study by Bara *et al.*⁽¹⁾ the IPAQ was not used.

The aims of the present study are: to evaluate, through the IPAQ, the PAL of Physical Education undergraduate students of the Physical Education and Sports University of the Federal University of Juiz de Fora (Faefid-UFJF), concerning gender and time of study; to evaluate and compare the PAL of undergraduation students of different courses of health/biology fields of the UFJF. These aims were based on the lack of works which evaluate the PAL in the academic population, as well as use the IPAQ in this population. Recent research has also shown a gap in the scientific environment concerning the investigation of issues related to the PAL of different populations.

METHODS

The present study was divided in two parts: the first was limited to the analysis of the Physical Education students of the Faefid-UFJF in all its semesters (year of 2004) and the second comparing freshmen students (year of 2004) of four different courses of the health/biology fields of the UFJF (Physical Education; Pharmacy and Biochemistry; Dentistry and Biology).

Subjects

280 individuals participated in the study and were divided in two groups: group 1 and group 2. Group 1 consisted of students from the first to the eighth semesters of Physical Education (Faefid-UFJF), with a total of 194 students; 100 males and 94 females, mean age 21.23 ± 2.68 years. Group 2 consisted of students of

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the first semester (6 initial months of the course corresponding to a college semester) of four undergraduation courses of the health/biology fields – Physical Education (n = 20); Pharmacy and Biochemistry (n = 25); Dentistry (n = 18) and Biology (n = 23) – of the Federal University of Juiz de Fora with a total of 86 students; 17 males and 69 females, mean age 19.7 ± 2.6 years and body mass index (BMI) of 23.3 ± 2.6 Kg/m² for males and 19.9 ± 2.1 Kg/m² or females.

Instruments

The instrument used for measurement of the physical activity level was the International Physical Activity Questionnaire (IPAQ), short version. This questionnaire had its validity tested in Brazil by Matsudo *et al.*⁽²¹⁾ in a study conducted with a sample of 257 males and females who were submitted to the questionnaire (long and short versions). Among the many conclusions observed, the IPAQ in its two versions had its validity and reproducibility compared with other instruments already accepted and internationally used for measurement of physical activity. In group 2, the weight and height data of the subjects were also added so that the BMI of the sample could be calculated as well.

IPAQ classification

The inquiries of the questionnaire are related with physical activities performed on the last week prior to the questionnaire application. The students had their data registered, evaluated and were later classified according to the IPAQ orientation which divides and names the categories under:

Sedentary – does not perform any physical activity for at least 10 continuous minutes during the week;

Insufficiently Active – consists of classifying the individuals who practice physical activities for at least 10 continuous minutes per week; however, insufficiently in order to be classified as active. In order to classify the individuals under this criterion, the duration and the frequency of the different kinds of activities are summed (walks + moderate + vigorous). This category is divided in two groups:

Insufficiently Active A – performs 10 continuous minutes of physical activity, following at least one of the mentioned criteria: frequency – 5 days/week or duration – 150 minutes/week;

Insufficiently Active B – does not reach any of the criteria of the recommendation mentioned in the Insufficiently Active A individuals;

Active – fulfills the following recommendations: a) vigorous physical activity – ≥ 3 days/week and ≥ 20 minutes/session; b) moderate or walking – ≥ 5 days/week and ≥ 30 minutes/session; c) any activity summed: ≥ 5 days/week and ≥ 150 min./week;

Very Active – fulfills the following recommendations: a) vigorous – ≥ 5 days/week and ≥ 30 min/session; b) vigorous – ≥ 3 days/week and ≥ 20 min/session + moderate and or walking ≥ 5 days/week and ≥ 30 min./session.

Procedures

The questionnaire was handed to the subjects and they received the same verbal orientation afterwards. Written orientation on the suitable procedures was also present in the questionnaire. Any question was answered at the time of the completion by the therapist responsible for the IPAQ's application; however, the subjects did not communicate with each other. The questionnaires' distribution was performed according to availability of each class (and/or courses), in the final minutes of each class, being its completion voluntary. There was not time limit for the questionnaire's completion. All participants answered to a free and clarified consent form explaining the objectives, procedures and voluntary nature of the study. The right to remain anonymous was also guaranteed to the participants.

Statistical analysis

Descriptive statistics was used for the observation of the percentual distribution of the sample concerning the proposed categories by the instrument; their distribution by semester of the Physical Education course; gender difference and among different courses. Whenever necessary, the Chi-square test present in the SPSS 11.0 version was applied. The *t-Student* test was applied for the paired results. The significance level in all cases was established in $p < 0.05$. The data were presented in mean \pm standard deviation.

RESULTS

Group 1

Figure 1 demonstrates that, in the total of the sample (n = 194), 44% of the Physical Education students were classified as Very Active; 48% as Active; 1.5% as Insufficiently Active – B and 6% as Insufficiently Active – A, without any incidence of sedentarism. It can be also observed that, male individuals had a higher concentration in the Very Active classification comparing to females, who presented higher incidence in the Insufficiently Active – A and Insufficiently Active – B classifications when compared with males. These two last results summed result in 7.5% of the total of the sample. The majority of these 7.5% is consisted of females (78%).

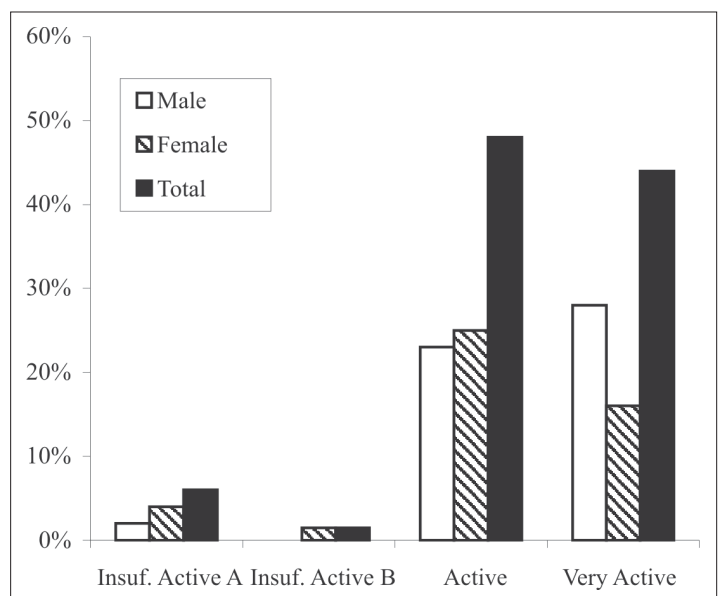


Figure 1 – Classification of the NAL by gender in Physical Education students. There was not significant difference between genders ($p < 0.05$).

Nevertheless, the Chi-square test application showed that there is no significant difference ($p > 0.05$) between the male and female groups of Physical Education students, showing that the quantity of the physically active individuals is similar in both groups.

Generally observing the undergraduation time and the physical activity level ratio (figure 2), we confirmed a homogeneity in the percentages of individuals classified as Very Active/Active between 85 and 100% of the analyzed semesters. Similarly, the curve of the semesters concerning the Insufficiently Active classification varied between 0 and 15%. These data were confirmed by the chi-square test which did not find statistically significant differences ($p > 0.05$) when the physically active individuals groups were divided from the first to the fourth semester and from the fifth to the eighth semester.

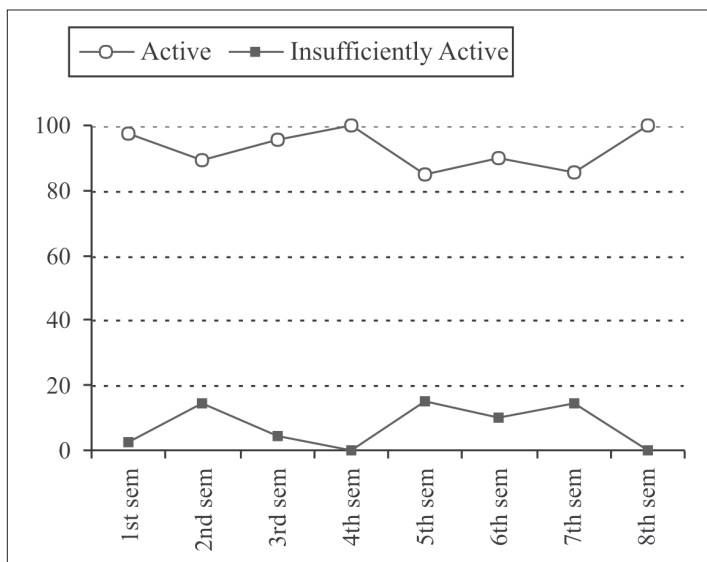


Figure 2 – Undergraduation time and the physical activity level ratio in Physical Education students

Group 2

Table 1 presents group 2 characterization. The BMI of the male sample ($23.3 \pm 2.6 \text{ kg/m}^2$) is higher than the female one ($19.9 \pm 2.1 \text{ kg/m}^2$), which is a statistically significant difference ($p < 0.05$).

Concerning the physical activity level between men and women in the four courses (table 2), a higher percentage of Insufficiently Active individuals is observed among women when they are compared with men, who were more physically active. Such percentage difference was evidenced when the *chi-square* was applied. It showed a statistically significant difference ($p < 0.05$) between groups, suggesting hence, that the female sample is less physically active than the male.

When comparing the different courses analyzed (table 3), the Biology and Physical Education students had a lower index of Insufficiently Active, much lower than the Pharmacy and Dentistry students. Consequently, the group value of the Active/Very Active categories was higher in Biology (86.9%) and Physical Education

TABLE 1
Characterization of group 2 subjects.
Age and BMI are presented in mean \pm standard deviation

	Sample	Age (years)	BMI (Kg/m ²)
Male (n = 17)	19.75%	21.6 \pm 4.4	23.3 \pm 2.6
Female (n = 69)	80.25%	19.2 \pm 1.5	19.9 \pm 2.1
Total (n = 86)	100%	19.7 \pm 2.6	20.7 \pm 2.5

TABLE 2
Classification of the physical activity level by gender in group 2

	Insufficiently active	Active	Very active
Male (n = 17)	6%	70.5%	23.5%
Female (n = 69)	32%	53.6%	14.4%
Total (n = 86)	26,7%	56.9%	16.4%

TABLE 3
Classification of the physical activity level by course in group 2 (n = 86)

	Insufficiently active	Active	Very active
Biology (n = 23)	13.04%	73.91%	13.04%
Physical education (n = 20)	10%	55%	35%
Pharmacy (n = 25)	44%	48%	8%
Dentistry (n = 18)	38.89%	50%	11.11%

(90%) when compared with Pharmacy (56%) and Dentistry (61.1%). However, such difference was not statistically significant ($p > 0.05$).

DISCUSSION

Group 1

The group 1 results with Physical Education students contrast with the findings by Mello⁽⁷⁾, Brown *et al.*⁽²⁴⁾ and Cerin *et al.*⁽³⁾. The sample of this study demonstrated a regular physical activity level higher than the different populations analyzed. Nonetheless, it is worth mentioning that these authors have used other kinds of methods for the evaluation of the physical activity level, such as the weekly quantity of moderate and vigorous activities⁽³⁾ and the *Behavioral Risk Factor Surveillance System* (BRFSS) which only analyses the physical and leisure activities⁽²⁴⁾.

In another viewpoint, the present results clash with the results by Bara Filho *et al.*⁽¹⁾ who verified a tendency of reduction of the physical activity levels during the career through a specific questionnaire elaborated for the study. It is important to highlight that the mentioned study analyzed graduated and Master's students while the present study selected undergraduation students.

Similarly to Cerin *et al.*⁽³⁾, the present study also verified a lower level of physical activity between the female Physical Education students when they were compared with males.

Moreover, the evolution of the transversal slice done from the first to the eighth semester shows a similar tendency presented by Telama *et al.*⁽²²⁾, since a maintenance of the physical activity levels of the population of Physical Education students population was observed.

Group 2

The comparison of the physical activity level between students of the first semester of the different undergraduation courses pointed to differences among them; since Physical Education and Biology students were more physically active than the Dentistry and Pharmacy ones.

The lowest level presented by these two courses (Dentistry and Pharmacy) are close to the findings by Mello⁽⁷⁾, Brown *et al.*⁽²⁴⁾ and Cerin *et al.*⁽³⁾ who point to a high level of physical inactivity among different populations. Generally, the results are also similar to the ones in the study by Cerin *et al.*⁽³⁾ who concluded that the female population has a lower index of regular physical activities.

It is concluded that men have a higher level of physical activities than women; the evaluated college students do not have similar patterns in the different courses and that the physical activity level keeps constant during the Physical Education course.

It is suggested that future investigations evaluate other undergraduation courses, students of different backgrounds (graduation, Master's and PhD) and different University sectors, as well as distinct society segments.

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