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Physical Activity Index of Female University Students

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Abstract

The aim of the study is to investigate the physical activity index on female university students. Depending on the results, measures for educational programmes meant to promote an active lifestyle will be taken. By a self-administered questionnaire, the physical activity index was investigated in university students (n=472). After applying the formula for physical activity index, we have obtained 34.745% sedentary subjects, 33.474% subjects with a poor physical condition, 13.347% active and healthy ones, and 11.440% and 6.991% with high and very good physical condition. Our research demonstrated the existence of poor and very poor physical condition in university female students and we recommended an improvement through educational programmes promoting an active lifestyle and wellbeing.

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1. Introduction

Physical activity is defined as any bodily movement produced by skeletal muscles that results in energy expenditure (Caspersen, Powell, & Christenson, 1985; Plavina, 2012). Nowadays, modernisation and our daily life – too busy – have led to a new kind of human being (Zhao et al, 2007). Researchers have suggested that the university students have similar issues of physical inactivity. More than half of the university students in the United States and Canada are not active enough (Irwin, 2004); the same goes for the European students (Steptoe et al, 1997; Stock, Willie, & Kramer, 2001). On the other hand, Australian university students tend to be more active: 39% were labelled insufficiently active (Leslie et al, 1999), similarly to Serbian students – 56.4% were physically active

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(Budakov et al, 2012). This is in contrast with New Zealand, for instance, where only 40% of the university students are engaged in 30-minute physical activities five or more days a week (Sinclair, Hamlin, & Steel, 2005). The study of El-Gilany (2011) reported 11.3% of the Egyptians students as physically inactive, much lower compared to a Saudi Arabian study, which reported 45.8% of the students as inactive (Al-Hazzaa, 1990). Another study has shown that only 26.4% of the university students are involved in physical activity (Musharrafieh et al, 2000). Physical activity is important for health, and promoting this type of activity is an important component of world health strategies. According to the World Health Organisation (2010), adults should do at least 150 minutes of moderate-intensity aerobic physical activity weekly, and to use in effort a large number of the body muscles. Physical activity is characterized by frequency, duration and intensity. In order to assess if the physical activity programme is efficient, we can calculate the Index of Physical Activity by getting sincere answers to questionnaire about how often, how much time and how many times students take part to physical activity (Dumitru, 1997). The aim of this study is to find out if the female university students have an active lifestyle by calculating the Index of Physical Activity (IPA) based on frequency, duration, and intensity of physical activity.

2. Methods

2.1. Subjects

The research was carried out on 472 female university students divided into three groups, by age: 18-19 years old (n=202), 20-21 years old (n=234), and over 21 years old (n=36). We mention that all the subjects were healthy, without any contraindication from the medical supervisor for physical activity. We have obtained the written consent of the subjects for their voluntary participation at the study. All study procedures were approved by an ethics commission according to the Declaration of Helsinki.

2.2. Procedures

Before applying the questionnaire, all subjects participated to anthropometric measurements, such as stature ($1.65 \pm 0.06\text{m}$) and body mass ($55.80 \pm 7.39\text{kg}$), according to standard methods proposed by the International Society for the Advancement of Kinanthropometry (ISAK, 2001). Based on these measurements, we have determined the body fat percentage by using the BMI formula: $\text{stature (m)}/\text{body mass}^2 \text{ (kg)}$.

The evaluation of the current exercise programme for each subject was done based on the Physical Activity Index Questionnaire (Franks & Howley, 1989 cited by Dumitru, 2007). Thus, we have selected the score for intensity (5 – sustained heavy breathing and perspiration, 4 – intermittent heavy breathing and perspiration, 3 – moderately heavy, 2 – moderate, 1 – light), duration (4 – over 30 minutes, 3 – 20 to 30 minutes, 2 – 10 to 20 minutes, 1 – less than 10 minutes), and frequency (5 – 6 to 7 times a week, 4 – 3 to 5 times a week, 3 – 1 to 2 times a week, 2 – a few times a month, 1 – less than once a month). The total score for the physical activity index is $\text{Intensity} \times \text{Duration} \times \text{Frequency}$. The evaluation for activity scores is shown in Table 1.

Table 1. Evaluation of Physical activity score

Score	Evaluation	Activity category
81-100	Very active lifestyle	High
60-80	Active and healthy	Very good
40-59	Acceptable but could be improved	Fair
20-39	Not good enough	Poor
Under 20	Sedentary	

2.3. Statistical analysis

The anthropometric measurements and the characteristics of physical activity are presented as mean \pm SD by age. The variable means for the characteristics of physical activity were compared by using the Post Hoc Tests, after setting a significant level of 5%. For the physical activity index, the percentages were illustrated by age group. The statistical analysis was performed by using the SPSS 20.0 for Windows.

3. Results and discussions

The anthropometric measurements are presented in Table 2. Similar results are obtained for stature (m) and body mass index (%). For body mass, the t-test for equality of means has showed a significantly lower score for the 18-19 years old group than the older groups, over 21, respectively. The body mass index for all participants is the following: 21.4% are underweight, 75.0% are normal, and 3.6% are overweight.

Table 2. Mean±SD of anthropometric measurements by age groups

	Stature (m)		Body mass (kg)		BMI %	
	Mean	SD	Mean	SD	Mean	SD
Group of 18-19 years old (n=201)	1.64	±0.06	54.56	±6.37	20.05	±2.13
Group of 20-21 years old (n=229)	1.65	±0.06	56.02	±8.06	20.35	±2.46
Group over 21 years old (n=41)	1.66	±0.05	57.47	±7.59	20.82	±2.47
All groups (n=472)	1.65	±0.06	55.50	±7.39	20.26	±2.33

Table 3 presents the score for frequency, duration, intensity, and physical activity index per group and for all the groups of subjects. The Post Hoc Tests for multiple comparisons revealed significant group differences for the frequency of physical activity between the groups of 20-21 years old compared to the other two. This group demonstrated a lower frequency. As for the duration, scores were similar for all groups. The scores for intensity have showed a significant difference between group 1 and 2, with a higher score for group 2.

Table 3. Score of physical activity index (mean±SD) and multiple comparisons between groups

	Mean±SD				Post Hoc Tests Multiple Comparisons		
	Group 1 18-19 years	Group 2 20-21 years	Group 3 Over 21 years	All subjects	Group 1 vs. 2	Group 1 vs. 3	Group 2 vs. 3
Frequency	4.00±1.17	3.53±1.08	4.03±1.08	3.77±1.14	0.461*	0.033	0.494*
Duration	3.28±0.76	3.25±0.80	3.06±0.92	3.25±0.79	0.034	0.227	0.192
Intensity	2.39±1.42	3.12±1.44	2.61±1.62	2.77±1.49	0.729*	0.220	0.509
Physical Activity Index	31.09±23.91	36.73±28.32	34.39±28.32	34.14±25.60	5.637	3.300	2.338

*The mean difference is significant for the 0.05 level

Table 4. Evaluation of physical activity index score by percent

	81-100		60-80		40-50		20-39		Under 20		Total
	N	%	N	%	N	%	N	%	N	%	N
18-19 years (N=202)	17	8.415	16	7.920	22	10.891	71	35.148	76	37.623	202
20-21 years (N=234)	32	13.675	16	6.837	35	14.957	79	33.760	72	30.769	234
Over 21 (N=36)	5	13.888	1	2.777	6	16.666	8	22.222	16	44.444	36
Total subjects (N=472)	54	11.440	33	6.991	63	13.347	158	33.474	164	34.745	472

Table 4 shows the evaluation of the physical activity index. A very active lifestyle is characteristic for 11.440% and an active and health lifestyle for 6.991% of the female university students. On the other hand, 34.745% of the subjects are sedentary and 34.474% do not do enough physical activity. An acceptable physical activity level characterizes 13.347% of the female university students. This study shows that 34.745% of the female university students are sedentary, which means they do not practice any type of physical activity. A similar study conducted in Egypt reported 11.3% inactive participants (El-Gilany et al, 2011); in China and Brazil, one-third of the students were found to be inactive (Abdullah et al, 2000; Fontes & Vianna, 2009). An American study reported 17% of college students as physically inactive (Suminski et al, 2002). Researchers found that 81.3% of university students that were inactive maintained the sedentary lifestyle after finishing the studies (Sparling & Snow, 2002). The physical activity level of the university students is not higher than that of the general population (Zhao et al, 2007). The same study indicates that 5.8% of the Olomuc university students are inactive and 15% of the Chinese students, respectively. In the opinion of Ruiz Tandero (2011), the main reasons for failing to practice physical activities are the lack of time, the tight schedule, the costs, and the distance. Among their sports preferences, they mentioned collective sports, cycling, and outdoor activities. Table 5 shows the preferences of female university students

concerning physical activity, by age groups. The most preferred types of physical activities are walking and running.

Table 5. Preferred types of physical activity by female university students

Rank	18-19 years old (N=202)	20-21 years old (N=234)	Over 21 years old (N=36)	Total group (N=472)
1.	Walking	Running	Walking	Walking
2.	Running	Aerobic	Fitness	Running
3.	Aerobic	Walking	Aerobic	Aerobic
4.	Fitness	Volleyball	Football	Dance
5.	Dance	Dance	Pilates	Volleyball

In our opinion, students prefer these kinds of physical activities because they can be performed anytime, anywhere and with no cost. Out of 472 participants, 159 declared that they did not practice any physical activity.

4. Conclusions

In conclusion, the majority of female university students are sedentary and they do not have a good enough level of physical activity. The university should organize information sessions about the benefits of physical activity on health and, at the same time, it should promote the practice of all forms of physical activities in the free time. Future strategies may help students to adopt an active lifestyle, but it is known that changing the physical activity behaviour is a battle that cannot be easily won.

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