109 - PHYSICAL ACTIVITY, BODY COMPOSITION, AND ANTHROPOMETRIC PROFILE OF SELECTED SUBJECTS OF THE RIO DO SINOS VALLEY, RIO GRANDE DO SUL

JOÃO CARLOS JACCOTTET PICCOLI
OTÁVIO AZEVEDO BERTOLETTI;
GREICE TERESINHA DE OLIVEIRA
FEEVALE, NOVO HAMBURGO, RS,
joaopiccoli@feevale.br

INTRODUCTION

Every year, more than 2 millions of deaths worldwide are attributed to physical inactivity. Such deaths are linked to the growth of chronic degenerative diseases - CDD (60%), such as cardiovascular diseases, diabetes, and the various forms of cancers. Based on this trend, a forecast for the year 2020 indicates that 73% of death in the world will be associated to CDD (WORLD HEALTH ORGANIZATION, 2000).

The lack of regular physical activity, associated to a person's eating habits, sedentarism, among other factors, contribute to the development of degenerated chronic diseases. This statement is corroborated by statistical data that show that 70% of the Brazilian population do not participate in regular physical activities (RIO DE JANEIRO, 2004).

Furthermore, 60% of Brazilians does not present a suitable eating diet. Among the health risk factors for the studied cardiovascular diseases, it was then observed a prevalence of obesity in 38% of the subjects of the study, dislipidemics in 26%, and diabetes mellitus in 5% of them. The lack of physical activity and an inappropriate diet in qualitative and quantitative terms increases the occurrence of such diseases (CERVATO et al. 1997).

The population inquiries have registered an alarming increase in the incidence of obesity in the last three decades in Brazil. Monteiro, Conde, and Castro (2003) researched the relation between obesity and schooling and observed a tendency towards the former according to the population level of schooling. While the risk of obesity increased in all levels of schooling from 1975 to 1989, mainly among men and women in the last years of school, from 1989 to 1997, the number of obese subjects was higher among those that did not go to school. The numbers became stable or even decreased among middle and higher schooling level women. As a result of the recent tendency it decreases the positive relation between schooling and the risk of obesity in men and it increases in women.

Guedes and Guedes (2001) stating Williamsom and Després et al. say that epidemiological research observed that a sedentary style of life demonstrated risk related to overweight and obesity when compared to those more active physically. According to the American College of Sports Medicine (2000), the excess of body fat is associated to high blood pressure, diabetes type II, and hyperlipidemics. Studies showed the risk to get sick and die of chronic degenerative diseases such as high blood pressure, diabetes type II, heart attack, and cancer is Increasing and the Body Mass Index BMI of 25 or higher, is a basic index to predict them (HEYWARD; STOLARCZYK, 2000). Such index has been epidemiologically utilized to identify problems related to low weight and high weight, such as obesity (MINISTÉRIO DA SAÚDE, 2003; INSTITUTO NACIONAL DO CANCER, 2003).

The BMI has been used epidemiologically to identify the health risk factors associated to low and high weigh such as obesity (HEYWARD; STOLARCZYK, 2003).

Taking into account the importance of such matter it was decided to carry out this study that has the objective to verify the level of physical activity (PAL) and the anthropometric profile of selected subjects of the Vale do Rio do Sinos, Rio Grande do Sul.

MATERIALS AND METHODS

This study had a descriptive nature and a sample of 187 subjects (88 males and 99 females), with ages ranging from 18 to 80 years of age, all from Ivoti, Dois irmãos, Estância Velha, Campo Bom, and Novo Hamburgo, cities from Rio do Sinos Valley region, State of Rio Grande do Sul, Brazil. It was utilized the IBGE residence criterion to build the study sample . The IPAQ (short form) was used to classify the subjects in insufficiently active (IA), sufficiently active (SA), and very active (VA), and to verify the time average the subjects stayed seated during the day. The percentage of body fat was calculated according to Pollock' s 1978 study for subjects of both sexes in ages up to 55 and 61 years of age and for those above such ages, the William´s 1992 study.

In order to identify the difference among the variables body fat percentage, body fat mass, lean body mass, waist and hip circumferences in relation to the classification of the body mass index (normal weight, overweight, and obese) it was used the ANOVA, and Tuke's post hoc test at 5% level of significance. The same statistical method was used to find out the difference among the physical activity levels (PAL) and the time the subjects were seated.

RESULTS AND DISCUSSION

The study showed that 17.6% (n=33) of the subjects (men= 48%, women=52%) were classified as very active; 26.8% (n=50) sufficiently active (men= 42%, women=58%), and 55.6% (n=104), insufficiently active (men= 49%, women=51%). A similar study by Matsudo´s et al. (2002) evaluated 2001 subjects from 14 to 77 years of age and found out that the majority (46.5%) of them was classified as insufficiently active. Table 1 shows the average, standard deviation, and the minimum and maximum values found in the sample. The average Body Mass Index of studied women and men was 25.2% and 25.6 $kg.m^{-2}$, respectively. The percentage of the average women and men body fat percentages were 31.7% and 23.7% respectively. These values shows a high average of body fat percentage Iin the sample women.

Table 1 - Distribution of the average and standard deviation, and the minimum and maximum values of the studied variables

Variables	$\bar{X} \pm s$	Minimum	Maximum
Age (years)	39,5 ± 15,2	18	81
Weight (kg)	72,1 ± 14,1	44,1	115,7
Height (cm)	168,5 ± 9,1	148,5	191,5
Waist circunference (cm)	83,9 ± 12,1	60,0	124,5
Hip circumference (cm)	100,1 ± 8,6	82,0	136,0
Body fat percentage	27,9 ± 9,8	7,7	48,2
Body fat mass (kg)	20,3 ± 9,1	4,6	46,1
Lean body mass (kg)	51,8 ± 11,2	32,6	81,6
BMI ($kg.m^{-2}$)	25,4 ± 4,7	17,9	42,7
Time seated ($min.dia^{-1}$)	314,8 ± 162,3	20	780

Table 2 shows the average and the standard deviation of the variables of the ANOVA. analyzed level of physical activity and the *p* value for the ANOVA. It was observed a significant difference between the levels IA and VA (p=0,001) and the SA and VA (P=0.043) in relation to time been seated a day when the Tukey´s *post-hoc* is used. This shows that in the average the VA subjects presents significant lower time seated subjects than the subjects IA and SA.. However, it was observed no significant difference in variables such waist and hip, body fat percentage, lean body mass, and BM.;

It can be observed then that the subjects classified as insufficiently active stayed seated in an average of 5.7 hours and the very active stayed 3.8 hours a day, active have a tendency to stay seated in an average of 5.7 hours a day (p=0,002).

Table 2- Distribution of the time being seated in minutes per day and the anthrpometric variables according to the level of physical activity (n=187)

Variables	Level of Physical Activity			p
	Insufficiently active	Sufficiently active	Very active	
	$\bar{X} \pm S$	$\bar{X} \pm S$	$\bar{X} \pm S$	
Waist circunference (cm)	85,2 ± 12,5	82,8 ± 12,0	81,4 ± 12,1	0,224
Hip circumference (cm)	101,4 ± 8,6	100,3 ± 8,1	99,6 ± 9,4	0,514
Body fat percentage	27,9 ± 9,5	28,3 ± 10,8	27,3 ± 9,8	0,909
Body fat mass (kg)	20,8 ± 9,0	20,5 ± 10,0	18,6 ± 8,1	0,501
Lean body mass (kg)	52,5 ± 11,5	50,1 ± 10,1	51,4 ± 11,5	0,550
Time seated (min.dia^{-1})	25,8 ± 4,7	25,1 ± 4,9	24,6 ± 4,2	0,366
Waist circunference (cm)	342,1 ± 174,5	314,4 ± 139,8	229,2 ±123,1	0,002*

* ANOVA among the three levels of physical activity considering p<0,005.

Analyzing the BMI, determined by the ratio of weight in kilograms and the square of height in meters, it was observed a prevalence of 51.1% (n=94) normal weight, 33.7% (n=62) overweight, and 15.2% (n=28) obese subjects.

The average and standard deviations of the anthropometric variables analyzed are presented in table 3.

Table 3 Anthropometric variables and body composition according to BMI.

Variables	Normal weight n= 94	Overweight n= 62	Obese n= 28	p
	$\bar{X} \pm S$	$\bar{X} \pm S$	$\bar{X} \pm S$	
Waist circumference	75,6 ± 7,4	89,9 ± 6,1	100,2 ± 10,0	0,000
Hip circumference	95,0 ± 5,2	103,0 ± 6,2	113,4 ± 7,6	0,000
Body fat percentage	24,8 ± 9,1	28,9 ± 8,9	36,2 ± 9,3	0,000
Body fat mass	14,9 ± 5,5	22,3 ± 6,1	34,8 ± 6,6	0,000
Lean body mass	48,6 ± 9,4	55,3 ± 11,7	56,3 ± 11,3	0,000

Both waist and hip circumferences and body adiposity showed the same significant difference at p=0.000 level among the three BMI categories.

The subjects´ lean body fat mass (0.000) of the normal subjects was significant lower than in the overweight ones (p=000) and in the obese ones (p=002). The percentage of the body fat was significant lower in overweight subjects that in the obese ones. It was not found out a significant difference in the lean body fat mass in overweight subjects when compared to to the ones obese (p=0.917).

The normal weight subjects lean body mass were significant lower than the overweight ones level (p=0.000), and the obese ones (p= 0.002). There was no significant difference in the lean body mass of overweight subjects in relation to the obese ones (p=0.917).

The body fat percentage of the normal weight subjects was significant lower than the one observed in the overweight subjects (p=0.015) and in the obese ones (p=0.000). However, among the subjects classified as overweight and obese it was found a significant difference (p=t p=0.001).

CONCLUSION

As to the subjects from Ivoti, Dois Irmãos,Estância Velha, Campo Bom, and Novo Hamburgo, there was a higher prevalence in individuals insufficiently actives, represented mainly by overweight (p=0.015) and obese subjects (p=0.000). The percentage of body fat was significantly lower in overweight subjects than in the obese ones (p=0,001).

The insufficiently active subjects were also classified as over weight and obese. However, it could be observed that the majority of the subjects had a normal weight. The insufficiently active subjects stayed 2 hours more than the very active ones. This implies that inactivity is presented in this group.

The body fat percentage was higher in the obese subjects than in the other ones. Such results reinforce the idea of considering the Body Mass Index as an adequate estimator for the calculation of the body fat percentage in individualspopulation studies.

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PHYSICAL ACTIVITY, BODY COMPOSITION, AND ANTHROPOMETRIC PROFILE OF SELECTED SUBJECTS OF THE RIO DO SINOS VALLEY, RIO GRANDE DO SUL

ABSTRACT

This research had the objective to identify the level of physical activity (LPA) and the anthropometric profile and body composition of selected subjects of the Vale do Sinos, RS. The sample of the study was composed of 187 subjects with age ranging from 18 to 80. The IPAQ and the anthropometric assessment were used to collect the data. The ANOVA and Tukey post-hoc test were used to identify the differences between the variables at 0.05 level. It was observed a prevalence of 17.6% of the subjects (n=33) classified as very active, 26.8% (n=50) sufficiently active, and 55.6% (n=104) insufficiently active. A significant difference (p=0.002) was found between the LPA and the time the subjects stayed seated in a day. In relation to Body Mass Index, there was a prevalence of 51.1% (n=94) of the subjects classified as normal weight, 33.7% (n=62), overweight, and 15.2% (n=28), obese. The waist and hip circumferences and the body adiposity presented the same significant difference (p=0.000). It was concluded that there was a higher prevalence of subjects insufficiently active and the Body Mass Index can also be considered a simple and adequate estimator for the calculation of the body fat percentage in population studies. Key-words: Physical activity. Body mass. Anthropometry. Body Mass Index.

ACTIVITÉ PHYSIQUE, COMPOSITION CORPORELLE ET VARIABLES ANTHROPOMÉTRIQUES D'INDIVIDUS SELECCIONNÉS AU VALE DOS SINOS

RESUME

L'investigation a eu comme objectif vérifier le niveau d'activité physique (NAP) et le profil anthropométrique et composition corporelle d'individus seleccionnés au Vale dos Sinos, RS. L'échantillon de l'étude a été composé par 187 sujets entre 18 et 80 ans, résidents au Vale dos Sinos, RS. Les données ont été obtenues à travers l'IPAQ court et l'évaluation anthropométrique. Nous avons utilisé l'ANOVA avec test Post Hoc de Tukey pour identifier les différences entre les variables au niveau de signification de 5%. Nous avos observé une prédominance de 17,6 % des sujets (n=33) classés comme très actifs, 26,8 %(50) suffisament actifs et 55,6 % (n=104) insuffisament actifs. Nous avos identifié une différence significative (p=0,002) entre le niveau d'activité physique et le temps moyen assis par jour. En ce qui concerne l'IMC a eu une prédominance de 51,6 % (n=94) d'individus eutrophiques, 33,7 % (n=62) avec surpoids et 15,2 % (n=28) avec obesité. La circonférence de la ceinture et de la hanche ainsi que la masse adipeuse ont présenté la même différence significative (p=0,000) entre les trois catégories de IMC. Le pourcentage de grasse des sujets eutrophiques a été significativement plus petit que celui des individus avec surpoids (p=0,015) et des obèses (p=0,000). Nous avons conclu qu'a eu une prédominance d'individus insuffisament actifs dans l'échantillin étudié. Le pourcentage moyen de grasse des individus obèses a été plus grand que celui trouvé parmi les eutrophiques et avec surpoids. Celà démontre que l'usage du IMC en des études de population reflète bien les risques pour la santé liés à l'excès de grasse. Anthropométrie, IMC.

Des mots clés : Activité physique. Composition corporelle. Variable anthropomètriques.

ACTIVIDAD FÍSICA, COMPOSICIÓN CORPORAL E VARIABLES ANTROPOMÉTRICAS DE INDIVIDUOS SELECCIONADOS DO VALLE DE LOS SINOS, RS

RESUMÉN

La investigación tuvo como objetivo verificar lo nivel de actividad física (NAF) y lo perfil antropométrico y composición corporal de individuos seleccionados del Valle de los Sinos, RS. La muestra del estudio fue compuesta por 187 sujetos estratificada con edad entre 18 e 80 anos, residentes en Valle de los Sinos, RS. Los dados fueran obtenidos a través del IPAQ corto y de evaluación antropométrica. Utilizase a ANOVA con teste Post Hoc de Tukey para identificar diferencias entre las variables al nivel de significación de 5%. Se observó una predominancia de 17,6% dos sujetos (n=33) clasificados como mucho activos, 26,8% (50) suficientemente activos e 55,6% (n=104) insuficientemente activos. Se identificó una diferentia significativa (p=0,002) entre lo nivel de actividad física e el tiempo medio sentado por día. En relación al IMC hube una predominancia de 51,1% (n=94 de individuos eutróficos, 33,7% (n=62) con sobrepeso e 15,2% (n=28) con obesidad. La circunferencia de la cintura e de lo cuadril bien como a masa adiposa presentaran la misma diferenta significativa (p=0,000) entre las tres categorías de IMC. o % gordura dos sujetos eutróficos fue significativamente menor do que lo encontrado nos individuos con sobrepeso (p=0,015) e nos con obesidad (p=0,000). Concluyese que hubo una predominancia mayor do que lo encontrado nos eutróficos y con sobrepeso. Esto demostró que el uso del IMC en estudios poblacionales refleje adecuadamente os riscos a la salud vinculados al exceso de gordura. Palabras-claves: antropometría, IMC.

ATIVIDADE FÍSICA, COMPOSIÇÃO CORPORAL E VARIÁVEIS ANTROPOMÉTRICAS DE INDIVÍDUOS SELECIONADOS DO VALE DOS SINOS, RS

RESUMO

A investigação teve como objetivo verificar o nível de atividade física (NAF) e o perfil antropométrico e composição corporal de indivíduos selecionados do Vale do Sinos, RS. A amostra do estudo foi composta por 187 sujeitos, com idade entre 18 e 80 anos. Os instrumentos utilizados foram o IPAQ curto e a avaliação antropométrica. Utilizou-se a ANOVA com teste Post Hoc de Tukey para identificar diferenças entre as variáveis ao nível de significância de 5%. Observou-se uma prevalência de 17,6% dos sujeitos (n=33) classificados como muito ativos, 26,8% (50) suficientemente ativos e 55,6% (n=104) insuficientemente ativos. Identificou-se uma diferença significativa (p=0,002) entre o nível de atividade física e o tempo médio sentado por dia. Em relação ao IMC houve uma prevalência de 51,1% (n=94) de indivíduos eutróficos, 33,7% (n=62) com sobrepeso e 15,2% (n=28) com obesidade. A circunferência da cintura e do quadril bem como a massa adiposa apresentaram a mesma diferença significativa (p=0,000) entre as três categorias de IMC. O percentual de gordura dos sujeitos eutróficos foi significativamente menor do que o encontrado nos indivíduos com sobrepeso (p=0,015) e nos com obesidade (p=0,000). Concluiu-se que houve uma prevalência maior de indivíduos insuficientemente ativos. Os dados apontaram para o fato de se utilizar o IMC como um simples e útil preditor da quantidade de gordura em estudos populacionais.

Palavras chaves: Atividade física, composição corporal, antropometria, IMC.