84 - CORRELATION OF NUTRITIONAL STATE AND PHYSICAL ACTIVITY LEVEL IN ADULT INDIVIDUALS OF THE VALE DO SINOS REGION, RIO GRANDE DO SUL STATE, BRAZIL

LAIALA PITHAN; MATHEUS FERRAREZE; ANDRÉA CRISTINA DA S. BULHÕES; GERALDINE ALVES DOS SANTOS; JOÃO CARLOS JACCOTTET PICCOLI.
Centro Universitário Feevale - Novo Hamburgo, Rio Grande do Sul State, Brazil
lalapithan@gmail.com

INTRODUCTION

Given the nutritional transition processes occurring in different places of the world, eating experiences are modified regarding their eating habits patterns, causing an increase of high calorie diets which emphasize on the ingestion of carbohydrates and lipids. In parallel to this alteration on daily life, the lack of physical activity contributes to the occurrence of diseases associated to overweight and leads to antagonistic effects on the human metabolism. The metabolism decrease is conditioned to aging, therefore, the importance of healthy eating must be emphasized, as well as the quest for healthier living habits.

Common elements converge to a diet rich in fats, sugar and refined foods, with reduced amounts of fibers and complex carbohydrates. Simultaneous alterations in body composition, particularly the exceptional increase of obesity in the country, are associated to the predominance of this diet and to the progressive decrease of physical activity (MONTEIRO, 1995).

Recently, observational studies and experiments have evidenced the close relation between the diet's qualitative features and the occurrence of chronic degenerative diseases such as cardiovascular diseases; diabetes mellitus, non-insulin dependent; different types of cancer; and obesity (WHO, 1990).

The current technology, the switching of leisure activities - such as the replacement of the practice of sports and walks in the park for hours in front of the computer -, the decrease of occupational physical effort, as they make life easier, they also keep people from their physical activities. The data from the Brazilian Institute of Geography and Statistics (IBGE,1996) indicate that 19.2% of the Brazilian adults are poorly active, exercising only once a week, and only 7.9% exercise regularly, three times a week. Active individuals are healthier. Regular exercise helps reducing obesity, as well as offering an improvement in physical fitness and a decrease in mortality and morbidity rates, even for individuals who remain obese (HILL et al., 2000).

In face of this, the intention of this paper is to relate nutritional state (macronutrient intake) and deal with the levels of physical activity of selected adult individuals from the Vale dos Sinos Region, Rio Grande do Sul State, through a multidisciplinary study involving the Nutrition, Physical Education and Psychology areas.

METHODOLOGY

This descriptive study analyzed a sample composed of 981 subjects, from 18 to 80 years old and of both genders, residents of the Vale do Sinos Region, Rio Grande do Sul State, selected through convenience. The subjects were individually interviewed and submitted to the instruments of the study.

The gathering of data was carried out in the span of two and a half years, from January 2005 to July 2007. Information about the physical activity habits, frequency and time attributed to the individuals' life style were obtained using the short version of the International Physical Activity Questionnaire (IPAQ). Individuals who performed a physical activity for up to 10 minutes a week were classified as insufficiently active (IA). The ones who performed moderated activity, 3 days a week or more, for 20 minutes, were classified as sufficiently active (SA). Hence, the very active (VA) were the individuals who performed physical activities for 5 days a week or more, with a 30 min session.

In order to identify the individuals' eating habits and macronutrients intake (carbohydrate, protein and lipid), the food inquiry method was used, which consists of reporting all food consumed in the span of 24 hours, from the first to the last meal consumed within this interval. According to Majen and Barba (1995), this study allows a more accurate assessment of the daily average intake and constitutes a procedure which does not demand a long period of time for its application.

Afterwards, the food intake and the meal preparations informed by the interviewees were converted in home measures and weights. The objective was to identify, in the best possible way, the variety of ingredients in each cited meal. For the analysis of the food intake, through the quantification of the energy values of each meal in macronutrients, the professional version of the dietWin® software was used.

In order to evaluate the nutritional state, the Body Mass Index (BMI) was applied. The criteria adopted for age and gender classification values, as well as its respective cutoff points, were those proposed by the World Health Organization (WHO, 1998). For the admeasurement of the classifications of calculated anthropometric variations - body mass and height -, the Welmy scale with 100g precision was used. A stadiometer with 0.1cm precision, of the same brand, was used for height measurement. Three measurements were made between these two, considering the average value obtained.

The obtained results were analyzed statistically in the SPSS (15.0) software, through the Pearson product-moment correlation coefficient (PMCC) and ANOVA tests, in order to detect differences among the studied variables.

RESULTS

According to the obtained and identified results, presented on Table 1, the nutritional state of the individuals was classified as eutrophic (38.6%), overweight (39.6%) and obese (39.3%), in accordance with WHO standards.

Table 1 - Subjects absolute and relative frequency distributions as to their nutritional state and physical activity level (n=960)

Nutritional State	PHYSICAL ACTIVITY LEVEL						Total
	IA	%	SA	%	VA	%	
Normal	167	38,6	162	37,4	104	24,0	433
Overweight	127	39,6	129	40,2	65	20,2	321
Obese	81	39,3	87	42,2	38	18,4	206
Total	375		378		207		960*

*21 subjects were underweighted and were not included in the total figure.

The nutritional state average among the total of studied individuals revealed that there is a predominance of normality.

However, if we consider the quantity of people above the normal state as a whole (overweight plus obesity), this value would comparatively increase (Chart 1).

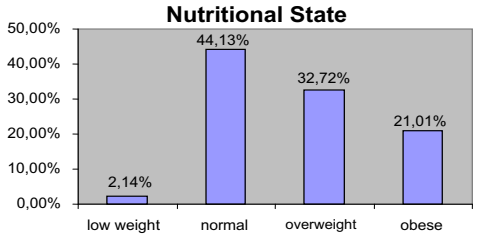

Chart 1 - Relative frequency distribution of the subjects as to their nutritional state (n=981)

Regarding the level of physical activity (IPAQ), the subjects were classified as insufficiently active (IA), sufficiently active (SA) and very active (VA), as presented on Chart 1.

The physical activity average intensity, observed in the total of studied individuals, showed a higher number of sufficiently active persons (Chart 2).

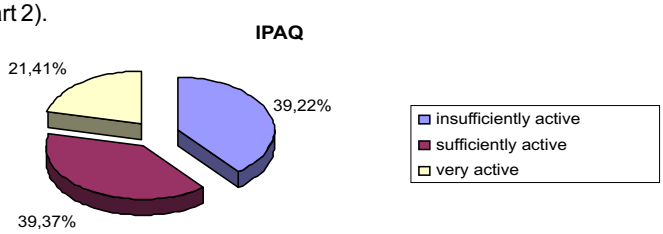

Chart 2 - Relative frequency distribution of the subjects according to their physical activity level (n=981)

A strong relation ($p<0.05$) among the 50-59 and the over 60 age-groups with the BMI was identified. The obesity index increases with age.

The carbohydrates intake, verified through a feeding record, was above the normal recommended value. On Table 3, this intake is intercepted with variables used in the IPAQ test. However, there was no significance.

Table 2 - Subject distribution according to carbohydrate intake and physical activity level (n=981)

CONSUMPTION INTERVAL	PHYSICAL ACTIVITY LEVEL						TOTAL
	IA	%	SA	%	VA	%	
<50% under the recommended	132	43,5	112	35,3	67	21,1	311
50-60% within the recommended	158	37,6	172	41,0	90	21,4	420
>60% above the recommended	92	36,8	102	40,8	56	22,4	250
TOTAL	382		386		213		981

No significant statistical differences were found between the BMI and the IPAQ.

A significance of $p=0.052$ was identified among sufficiently active individuals, being the intake of lipids under the recommended (30 to 35% of the total energy value), according to the WHO, as presented on Table 3.

Table 3 - Subject distribution according to lipid intake and physical activity level (n=981)

CONSUMPTION INTERVAL	PHYSICAL ACTIVITY LEVEL						TOTAL
	IA	%	SA	%	VA	%	
<25% under the recommended	129	36	151	42	77	22	357
25-35% within the recommended	92	37	96	37	67	26	255
> 35% above the recommended	162	44	139	38	68	18	369
TOTAL	383		386		212		981

DISCUSSION

The food we eat gives us fuel and build materials for life, supplying our bodies with structural elements and guaranteeing the necessary means for the execution of body processes which consume energy. After the basal necessities of the body are fulfilled, the extra energy is sent as fuel to the muscular activity, whether in a recreational, professional or sportive context (MAUGHAN; BURQUE, 2004).

Among the eating factors, the excess energy favors the increase of adiposity, mainly high carbohydrate and lipid ingestion (FRANCISCHI, 2004).

Obesity and physical inactivity were positively associated to the risk of developing cardiovascular diseases, comprising the most meaningful risk factors (GRUNDY et al., 1999).

The results of this study showed that there is a high ingestion of lipids by the individuals in our society, and that the increase of lipid intake does not stimulate its oxidation, in addition to being very effectively stored as body fat, at around 96% (WHO, 1998). The increase of lipid ingestion will induce a positive lipid balance and, therefore, the gathering of adipose body mass (FLATT, 1987, 1995). According to Krause (2002), with the increase of the macronutrient intake, the ingestion of oxidized LDL activates the macrophages, stimulating them to secrete mediators which send proliferative and inflammatory cascades, some of which lead to atherosclerosis. Usually, fat contributes with almost 35% of ingested calories, but the recommended is 30% at the most (MELVIN, 2002).

Lipids, as well as the remaining macronutrients, lead to obesity and can increase more than threefold the chances of

diabetes mellitus type 2, renal diseases, dyslipidemia and apnea during sleep. They also double or triple the risks of cardiovascular diseases and osteoarthritis, and can double the chances of certain types of cancer and production related hormonal abnormalities (HILL, 200).

Studies show that the effects of physical activity on the prevention of cardiovascular diseases are related to a better cardiovascular conditioning and to the increase of energy expenditure, with the decrease of blood pressure and the increase of high density lipoprotein (ANDERSEN, 1995).

In this case, as noted in the study, physical activity follows the modern pace of life: a growing number of inactive people are displaying a tendency towards increased overweight and obesity rates, especially when there is an association with inadequate eating patterns (CASTRO et al. 2006). Conscious eating and physical activity must be a part of the daily activities of all individuals who do not wish to have early aging (KAMMEL, 1998), altering epidemiological data which indicate that the obesity index increases with age.

Eating is the foundation of health and life. Those who eat well live longer and better. An individual who eats well will have a greater performance in sports, at work and in life (KAMEL; KAMEL, 1998)

Based on the importance of the evidence presented and on the magnitude of the health issues involved, the advice for dietetic changes was to reduce the intake of high fat and salt foods, as well as increase the intake of foods rich in carbohydrates and fibers. Through a balanced and connected exchange system, the food we eat must be converted into simpler substances, and later into even simpler ones: substances which our cells may use to maintain life (WILLIAMS, 1997).

CONCLUSION

According to Melvin (2002), even though both adequate exercising and good eating habits may separately provide benefits to health, a total decrease of risk factors is maximized when these two aspects are combined in a healthy life style. A healthy diet only needs a balanced proportion of foods of different groups, variety within the groups and moderation in the intake of any food.

Following the model of Williams (1997), health and physical aptitude in handling is based upon personal motivation and the support of others. Through this, attitudes are suggested in order to alter the population's current behaviors, such as changes related to overfeeding, high daily ingestions, along with the increase in exercising, which allows a gradual and healthy weight loss. Changes in eating habits for the prevention of present and future problems in life are highly recommended.

By promoting health we can benefit from the practice of physical activities and also from anthropometric, neuromuscular, metabolic and psychological improvements. Even though this study has not found any significant result, the importance of a regular practice of physical activities associated with a balanced nutrition is emphasized as a means to achieving a healthier life.

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CORRELATION OF NUTRITIONAL STATE AND PHYSICAL ACTIVITY LEVEL IN ADULT INDIVIDUALS OF THE VALE DO SINOS REGION, RIO GRANDE DO SUL STATE, BRAZIL

ABSTRACT

This paper aims at relating the nutritional state with the physical activity level of adult individuals of the Vale do Sinos Region, Rio Grande do Sul State, Brazil. In this descriptive study with 965 subjects from 18 to 80 years old, selected through convenience, the subjects were submitted to the short version of the International Physical Activity Questionnaire and to the 24h

food inquiry for the identification of the eating habits and macronutrients intake, calculated using the professional version of the dietWin® software. The Body Mass Index (BMI) was applied for the evaluation of the nutritional state, with the use of a scale and a stadiometer for variable height. The data was statistically analyzed through ANOVA and Pearson correlation. The results pointed to the following classification: 38.6% eutrophic, 39.6% overweight and 39.3% obese. As to the level of physical activity, the subjects were classified as insufficiently active (IA), sufficiently active (SA) and very active (VA). A strong relation ($p<0.05$) among the 50-59 and the over 60 age-groups with the BMI was identified: the obesity index increases with age. No significant statistical difference was found between the BMI and the IPAQ. A significance of $p=0.052$ was identified among sufficiently active individuals and the intake of lipids was under the recommended (30 to 35% of the total energy value), according to the WHO. Summarizing, the risk of developing obesity increases with age. Therefore, the practice of regular physical activity associated to balanced eating is of great importance in order to obtain a healthier life.

KEYWORDS: Eating control. Physical activity. Healthy habits.

LA CORRELATION DU ÉTAT NUTRITIONNEL ENTRE LE NIVEAU D'ACTIVITÉ PHYSIQUE CHEZ LES ADULTS DE LA RÉGION DU VALE DOS SINOS/RS

RESUME

Le but de cet article est de réaliser le rapport entre l'état nutritionnel et le niveau d'activité physique chez les individus adults de la région du Vale dos Sinos/RS. Cette étude est descriptive et analyse 965 individus de groupe d'âge de 18 à 80 ans, selectionés par convenance. Ils ont été soumis par le Questionnaire International d'Activité Physique (QIAP), version petite, et le Rappel alimentaire de 24 heures pour réaliser l'identification des habitudes alimentaires et des consommations de macronutriments, mésurés par le programme Dietwin Professional. En ce qui concèrne à l'évaluation de l'état nutritionnel, on a utilisé l'indice de masse corporelle, mésuré par une balance et un stadiomètre pour la variable d'estature. Les données ont été analysée statistiquement par l'ANOVA et la corrélation de Pearson. Les résultats montrent la classification suivante : 38,6% normaux ; 39,6% surpoids ; 39,3% obésités. Quant au niveau d'activité physique, les sujets ont été classifiés comme sédentaires (S), actifs (A) et très actifs (TA). On a identifié une significative corrélation ($p < 0,05$) entre le groupe d'âge de 50 à 59 ans et les plus de 60 ans et l'IMC : plus l'âge augmente, plus l'indice d'obésité s'agrandit. On n'a pas vérifié une significative différence statistique entre l'IMC et le QIAP. On a vérifié un taux significatif de $p= 0,052$ entre les individus actifs et la consommation insuffisante de lipides (30 à 35% de la ressource énergétique globale) selon l'OMS. En somme, le risque de déclencher l'obésité s'agrandit au cour de l'augmentation de l'âge. En effet, d'une importance capitale pour avoir une vie plus saine, l'activité physique régulière associé à une alimentation équilibrée est essentielle.

MOTS-CLES: Contrôle alimentaire. Activité physique. Habitudes alimentaires.

CORRELACIÓN DEL ESTADO NUTRICIONAL CON EL NIVEL DE ACTIVIDAD FÍSICA EN INDIVIDUOS DE LA REGIÓN DE VALE DOS SINOS/RS

RESUMEN

Este artículo intenta relacionar el estado nutricional con el nivel de actividad física en individuos adultos de la región de Vale do Sinos, Río Grande del Sur (RS). En este estudio, de carácter descriptivo, se utilizó 965 individuos, de 18 a 80 años, seleccionados por conveniencia. Las personas fueron sometidas al Cuestionario Internacional de Actividad Física (en formato corto) y a una averiguación alimentaria de 24 horas, para la identificación del hábito alimentario y consumo de macro nutrientes, calculados a través del programa Diet Win Profesional. Para la evaluación del estado nutricional se utilizó el índice de masa corpórea, evaluado a través de una báscula de equilibrio y un estadiómetro para la variable estatura. Los datos fueron analizados estadísticamente a través de la ANOVA y de la Correlación de Pearson. Los resultados apuntaron a la siguiente clasificación: 38,6% eutróficos, 39,6% con sobrepeso, y 39,3% obesos. Cuanto al nivel de actividad física, los individuos fueron clasificados como: Insuficientemente Activos (IA), Suficientemente Activos (SA) y Muy Activos (MA). Se identificó una fuerte correlación ($p<0,05$) entre el grupo etário de 50 a 59 años y mayores de 60 años con el IMC: cuanto mayor la edad, más alto el índice de obesidad. No se encontró diferencia estadísticamente significativa entre el IMC y el IPAQ. Se identificó una significancia de ($p=0,052$) entre individuos suficientemente activos y el consumo de lipidios abajo de la recomendación (de 30 a 35% del valor energético total) según el OMS. En síntesis, con el avance de la edad, se aumenta el riesgo de desarrollar la obesidad. De tal forma es muy importante la práctica regular de la actividad física asociada a una alimentación equilibrada para la obtención de una vida más sana.

PALABRAS CLAVE: Control Alimentario. Actividad Física. Hábitos Sanos.

CORRELAÇÃO DO ESTADO NUTRICIONAL COM O NÍVEL DE ATIVIDADE FÍSICA EM INDIVÍDUOS ADULTOS DA REGIÃO DO VALE DOS SINOS, RS.

RESUMO

O presente artigo busca relacionar o estado nutricional com o nível de atividade física em indivíduos adultos da região do Vale do Sinos, RS. Neste estudo, de característica descritiva, com 965 sujeitos, de 18 a 80 anos, selecionados por conveniência, os sujeitos foram submetidos ao Questionário Internacional de Atividade Física versão curta e ao inquérito alimentar de 24h, para a identificação de hábito alimentar e consumo de macronutrientes, calculados através do programa Diet Win Profissional. Para a avaliação do estado nutricional utilizou-se o índice de massa corporal, avaliado através de uma balança de equilíbrio e um estadiômetro para a variável estatura. Os dados foram analisados estatisticamente através da ANOVA e Correlação de Pearson. Os resultados apontaram para a seguinte classificação: 38,6% eutróficos, 39,6% com sobrepeso e 39,3% obesos. Quanto ao nível de atividade física, os sujeitos foram classificados como Insuficientemente ativos (IA), Suficientemente ativos (SA) e Muito ativos (MA). Identificou-se uma forte correlação ($p<0,05$) entre faixa etária de 50 a 59 anos e acima de 60 anos com o IMC: quanto maior a idade, maior o índice de obesidade. Não foi encontrada diferença estatisticamente significativa entre o IMC e o IPAQ. Identificou-se uma significância de ($p= 0,052$) entre indivíduos suficientemente ativos e o consumo de lipídios abaixo da recomendação (30 a 35% do valor energético total) segundo o OMS. Em síntese, com o avanço da idade, aumenta-se o risco de desenvolver obesidade. Sendo assim, é de fundamental importância a prática regular da atividade física associada a uma alimentação equilibrada para a obtenção de uma vida mais saudável.

PALAVRAS CHAVES: Controle alimentar. Atividade física. Hábitos saudáveis.