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ORIGINAL ARTICLE

OVERWEIGHT AND DIETARY CONSUMPTION OF ADULTS

EXCESSO DE PESO E CONSUMO ALIMENTAR DE ADULTOS

SOBREPESO Y CONSUMO DE ALIMENTOS DE ADULTOS

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ABSTRACT

Objective: to evaluate the relationship between overweight and food intake among adults attending a medical school. ***Method:*** cross-sectional, descriptive and quantitative study of 80 adults who received nutritional care during the period from August to December 2013. The variables studied were: body mass index, waist circumference, body fat percentage, age, gender, and energy and macronutrients consumption. Association was evaluated by chi-square test. The study had the project approved by the Research Ethics Committee CAAE 19987213.2.0000.5210. ***Results:*** overweight was found in 51,25% of the participants and obesity was 2,58 times more frequent in men. Central adiposity presence determined by the CC was associated with male gender (p<0,01). ***Conclusion:*** energy and macronutrients consumption, recommended above, was present in most adults, with no association to overweight. In the group studied, overweight was not associated with food intake. ***Descriptors:*** Nutritional Status; Food Consumption; Adult Health.

RESUMO

Objetivo: avaliar a relação entre excesso de peso e consumo alimentar em adultos atendidos em uma clínica escola. ***Método:*** estudo transversal, descritivo e quantitativo realizado com os 80 adultos que procuraram atendimento nutricional no período de agosto a dezembro de 2013. As variáveis estudadas foram índice de massa corporal, circunferência da cintura, percentual de gordura corporal, idade, sexo e consumo de energia e macronutrientes. Associação foi avaliada pelo teste Quiquadrado. O estudo teve o projeto aprovado pelo Comitê de Ética em Pesquisa CAAE 19987213.2.0000.5210. ***Resultados:*** o excesso de peso foi encontrado em 51,25% dos participantes e a obesidade foi 2,58 vezes mais frequente nos homens. Presença de adiposidade central determinada pela CC esteve associada com sexo masculino (p<0,01). ***Conclusão:*** consumo de energia e macronutrientes acima do recomendado esteve presente em grande parte dos adultos, sem associação com excesso de peso. No grupo estudado o excesso de peso não esteve relacionado com o consumo alimentar. ***Descritores:*** Estado Nutricional; Consumo de Alimentos; Saúde do Adulto.

RESUMEN

Objetivo: evaluar la relación entre el exceso de peso y la ingesta de alimentos entre los adultos que asisten a una escuela de medicina. ***Método:*** transversal, descriptivo y cuantitativo de los 80 adultos que buscaron atención nutricional durante el período de agosto a diciembre de 2013. El consumo fueron el índice de masa corporal, circunferencia de la cintura, porcentaje de grasa corporal, la edad, el sexo y las variables estudiadas energía y macronutrientes. Asociación se evaluó mediante la prueba de chi-cuadrado. El estudio tenía el proyecto aprobado por el Comité Ético de Investigación CAAE 19987213.2.0000.5210. ***Resultados:*** el sobrepeso se encuentran en 51,25% de los participantes y la obesidad fue de 2,58 veces más frecuente en los hombres. Presencia del adiposidad central determinado por el CC se asoció con el sexo masculino (p<0,01). ***Conclusión:*** el consumo de energía y macronutrientes encima de las recomendadas estuvo presente en la mayoría de los adultos, no hay asociación con el sobrepeso. En el grupo estudiado con sobrepeso no se asoció con la ingesta de alimentos. ***Descriptores*:** Estado nutricional; El Consumo de Alimentos; Salud del Adulto.

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INTRODUCTION

Overweight and obesity are considered global health problems that have increased, especially in urban areas of developing countries. In the Brazilian population, there was an increase in the prevalence of overweight and obesity in a period of 34 years, overweight identified in about half of men and women in the period between 2008 and 2009, exceeding 28 times the frequency weight deficit in males, and 13 times in women.[1]

It is important to notice that, in recent decades, there has been great change in the diet of the population, which is known as nutritional transition. In this context, in recent years individuals have made most meals away from home, which, in most cases, are rich in sugars and fats and low in fiber, vitamins and minerals. This situation can directly reflect the nutritional status of the population, contributing to the decline in the prevalence of malnutrition, especially in children, with hasty increase in the prevalence of overweight and obesity in adults.[2]

The acquisition of food in Brazil has undergone significant changes in recent decades, with a significant change in the components of the basic food consumed by a family in which there has been decrease in the acquisition of basic commodities such as rice, beans and manioc flour, and increase in the purchase of meat and milk.[3]

The significant progress of obesity in the world population is a government concern, given its association with the occurrence of chronic diseases. Studies show that components of lifestyle, such as physical inactivity and poor diet shown to be associated with increased obesity.[4] However, the dietary intake of individuals or groups of people is a complex task because the eating habits also involve symbolic aspects of social life, including personal influences and cultural context.[5]

The search for nutritional counseling in outpatient clinical care nutrition, either in the basic health network, or in clinics and private practices or school clinics is becoming more frequent. The assessment of inadequate food intake is extremely important, and requires knowledge of the usual diet, since the effect of inadequate nutrient intake, either by excess or deficiency, does not appear after a few days.[6] Thus, the nutritionist, besides working with individual dietary prescription for nutritional intervention, is also searching for nutrition education strategies aimed at correcting inadequacies in food consumption groups or individuals. Thus, the aim of this study is:

Assess Overweight relation to the macronutrient food intake of adults attended in a school clinic.

MÉTHOD

Article written from the dissertation << ***Excess weight and food intake in adults*** >> submitted to the Professional Master's Program in Health University Center Family UNINOVAFAPI. Teresina/PI, Brazil, in 2014.

Descriptive, cross-sectional study with a quantitative approach, conducted with 80 adults seen at a private college Clinical School in the city of Teresina - Piauí, who received nutritional care during the period from August to December, 2013.

The sample was defined according to a survey of attendances over the three semesters leading up to this study, where the average monthly visits amounted to 20 people, totaling 80 subjects in one semester.

The study included all adults aged between 20 and 59 years of both genders, who were attended in spontaneous demand in the period of the study. They agreed to participate in the study and were able to describe the food intake for a period of three days. Participants who failed to describe the food intake were excluded.

The variables studied were age, gender, marital status, education level, monthly individual income, weight, height, body mass index, waist circumference, body fat percentage, and dietary intake of energy and macronutrients.

For the assessment of food consumption, was used a food questionnaire in accordance with food three days recording technique, comprising two days during the week and one day on the weekend (Saturday or Sunday). All participants were instructed in the correct way to write down the foods, list the types of meals, preparations, portion sizes, household measures, quantities and times in which they were consumed.

The food and the amount consumed by each were included in the computer program Dietpro 5.5i. Quantitative analysis consisted in describing the total energy value (TEV) (kcal), carbohydrate (g/day), lipids (g/day) and protein (g/kg/day). To sort the suitability of daily energy intake and food intake of study macronutrients in relation to VET were used as distribution of reference values for carbohydrates, lipids and proteins those

recommended by the Dietary Reference Intakes (DRIS).[7]

The global nutritional status based on the Body Mass Index (BMI) was classified according to the cutoff points defined by the Food and Nutrition Surveillance System (SISVAN).[8] The waist circumference was measured with inextensible and inelastic tape measure with scale of 0,5 cm at the midpoint between the last rib and the iliac crest, and classified according to the cutoff points suggested by the World Health Organization (WHO),[9] as increased when greater than or equal to 80 cm for women and greater than or equal to 94 cm for men, and as very increased when greater than or equal to 88 cm for women and greater than or equal to 102 cm for men.

The percentage of body fat was measured by bioelectrical impedance analysis (BIA), with four-pole of Biodynamics equipment 310 (BIAT) model with the individual lying on a stretcher, with legs apart and hands open, two electrodes are placed on the right foot and 2 electrodes on the right hand evaluated. The percentage of body fat was categorized by gender according to cutoff points defined for adults.[10]

The forms were reviewed and categorized, and the data entered using the Microsoft Excel 2010. To compare means, was used the Student T test unpaired and associations were tested using the chi-square test. Differences were considered statistically significant at $p<0,05$, and the adopted confidence interval of 95%.

The study had its project approved by the Research Ethics Committee of the University Center UNINOVAFAPI, CAAE 19987213.2.0000.5210. All participants signed the Term of Consent (TC), following all ethical principles of Resolution 466/2012 of the National Health Council (CNS).

RESULTS

The data presented in Table 1 comprise information on the sample screened, in which socioeconomic characteristics are observed. In this study, there was a predominance of persons aged between 20 and 39 years (83,75%), of both genders, females (83,55%), unmarried (68,75%) and completed high school (83,75%). More than half (55%) declared they had no income. There was no statistically significant association between gender and marital status, education and income.

Table 1. Socioeconomic profile of adults attending Clinical School of Teresina/PI, Brazil, in 2013.

Socioeconomic data	Gender		Geral	p value *	Qui
	Male	Female			
	n (%)	n (%)	n (%)		
Age Group				0,466	0,532
20 to 39 years	10 (76,92)	57 (85,07)	67 (83,75)		
40 to 59 years	3 (23,08)	10 (14,93)	13 (16,25)		
Spousal situation				0,941	0,006
With partner	4 (30,77)	21 (31,35)	25 (31,25)		
No partner	9 (69,23)	46 (68,65)	55 (68,75)		
Education Level				0,620	0,955
Elementary	0 (0,00)	1 (1,49)	1 (1,25)		
Medium	10 (76,92)	57 (85,07)	67 (83,75)		
Superior	3(23,08)	9 (13,44)	12 (15,00)		
Monthly Income				0,376	3,106
No income	5 (38,46)	39 (58,20)	44 (55,00)		
Up to 01 minimum wages	2 (15,38)	13 (19,40)	15 (18,75)		
1 to 2 minimum wages	3 (23,08)	7 (10,44)	10 (12,50)		
More than two minimum wages	3 (23,08)	8 (11,96)	11 (13,75)		

** The p value was obtained by Chi-square test. The level of statistical significance set at p<0,05.*

It was observed that 51,25% of the participants were overweight, reaching 84,58% of men and 44,78% of women. Obesity was present in 46% of male participants, being 2,58 times more frequent than the female population. High fat percentage, determined by impedance analysis, was observed in 74,68% of the participants. Central adiposity presence, determined by the circumference increased or very increased waist, was associated with male gender ($p<0,01$). There was a statistically significant association ($p<0,05$) between gender, BMI and Waist Circumference (WC) (Table 2).

Table 2. Distribution of Body Mass Index, Waist Circumference and Body Fat related to the gender of adults attending Clinical School of Teresina / PI, Brazil, in 2013.

Nutritional Status data	Gender		Total	p value*	Qui
	Male	Female			
	n (%)	n (%)	n (%)		
Body mass index				0,051	6,953
Low weight	0 (0,00)	5 (7,46)	5 (6,25)		
Eutrophic	2 (15,38)	32 (47,76)	34 (42,50)		
Overweight	5 (38,43)	18 (26,86)	23 (28,75)		
Obesity	6 (46,15)	12 (17,92)	18 (22,50)		
Waist Circumference				0,026	0,732
Normal	3 (23,08)	41 (61,20)	44 (55,00)		
Increased	4 (37,77)	13 (19,40)	17 (21,25)		
Very Increased	6 (39,15)	12 (19,40)	18 (23,75)		
% Body fat				0,933	0,680
Low (malnutrition)	0 (0,00)	1 (1,52)	1 (1,27)		
Below average	1 (7,69)	5 (7,58)	6 (7,59)		
Average	2 (15,38)	12 (18,18)	14 (17,72)		
Above average	6 (46,15)	23 (34,85)	29 (36,71)		
High risk (obesity)	4 (30,77)	26 (39,39)	30 (37,97)		

** The p value was obtained by Chi-square test. The level of statistical significance set at p<0,05.*

Table 3 shows the average consumption of energy, carbohydrate, lipid and protein, according to gender. It was found that the study participants consumed an average of 1.926,21 kcal/day, the average daily energy consumption significantly higher in men (p<0,05), although consumption adjusted per kg body weight was higher in women. The average consumption of lipid and protein, in terms of percentage of VET, was also significantly higher in women.

Table 3. Consumption of energy, carbohydrate, lipid and protein in adults, according to gender. Teresina/PI, Brazil, in 2013.

Dietary consumption	Gender		Geral	p value†
	Male	Female		
	mean (standard deviation)	mean (standard deviation)	mean (standard deviation)	
Energy (kcal)	2048,42 (576,96)*	1895,05 (968,70)	1926,21 (903,97)	0,032
Energy (Kcal / Kg)	24,49 (9,87)	31,95 (20,33)*	30,72 (19,96)	0,028
Carbohydrate (%)	54,08 (7,08)	53,35 (7,51)	53,47 (7,39)	0,076
Carbohydrate (g)	280,62 (80,80)	254,23 (161,69)	258,57 (151,28)	0,092
Lipid (%)	27,24 (5,24)	27,51 (6,82)*	27,47 (6,56)	0,031
Lipid (g)	63,13 (20,96)	60,13 (21,36)	60,63 (20,34)	0,076
Protein(%)	18,66 (3,50)	19,12 (4,77)*	19,04 (4,57)	0,033
Protein (g)	98,45 (37,11)	83,84 (26,52)	86,25 (28,77)	0,098
Protein (g / kg)	1,14 (0,53)	1,41 (0,61)	1,37 (0,58)	0,061

** Statistically significant difference, unpaired t test.*
† The p value was obtained by Chi-square test.
The level of statistical significance set at p<0,05.

Table 4. Association between consumption of energy, carbohydrate, lipid and protein overweight adults attending Clinical School of Teresina / PI, Brazil, in 2013.

Dietary consumption		Overweight			p value*	Qui
		Geral	Male	Female		
	N†	‡C (%)	C (%)	C (%)		
Energy					0,380	1,936
Below the recommended	17	4 (9,77)	0 (0,00)	4 (13,34)		
According to the recommendation	17	5 (12,19)	2 (18,19)	3 (10,00)		
Above recommended	46	32 (78,04)	9 (81,81)	23 (76,66)		
Carbohydrate (g)					0,915	0,178
Below the recommended	12	3 (6,81)	1 (9,09)	2 (6,06)		
According to the recommendation	24	5 (11,36)	1 (9,09)	4 (12,12)		
Above the recommended	44	36 (81,83)	9 (81,82)	27 (81,82)		
Lipids (g)					0,249	2,778
Below the recommended	6	2 (3,17)	0 (0,00)	2 (3,07)		
According to the recommendation	25	23 (36,50)	5 (62,5)	18 (27,69)		
Above the recommended	49	38 (60,33)	3 (37,5)	35 (53,84)		
Protein (g)					0,475	1,488
Below the recommended	2	2 (2,85)	1 (7,69)	1 (1,75)		
According to the recommendation	11	9 (12,85)	2 (15,38)	7 (12,28)		
Above the recommended	67	59 (84,30)	10 (76,93)	49 (85,97)		

** The p value was obtained by Chi-square test. The level of statistical significance set at p <0.05.*
† N = number of people analyzed in the extract.
‡ C = number of cases.

The results of the relationship between food intake and overweight are shown in Table 4. It was found that 78,04% of adults overweight consumed amount of energy higher than recommended. Regarding the adequacy of macronutrients intake, it was observed that 81,83% of respondents overweight showed above the recommended intake for carbohydrate, and 60,33% for lipids.

Regarding to protein intake, it was found that 76,93% of men and of 85,97% women overweight presented consumption above the recommended. However, there was no statistically significant association between gender and consumption of energy or macronutrients.

DISCUSSION

In this study the majority of participants were female (83,5%). This result is consistent with study involving adults attending a nutritional evaluation laboratory of a University Center of Minas Gerais, where 85,3% of people who received nutritional care were female.[11] This is a current trend, justified in part by the fact that women prove to be more concerned about their health and aesthetics.

In relation to socioeconomic data, a study conducted in northeastern Brazil with university adults with a mean age of 37,5 years, showed that 66% were unemployed, 23% were illiterate and 82,6% had income below the minimum wage.[12] Work in the city of Ribeirão Preto-SP with adult residents showed that more than half of the study population had eight or more years of schooling, had formal work and said living with a partner at the time of interview.[13] These results are partially different from those found in this study, in which adults reported they were living with a partner and had completed high school, although most stated they had no income. The results in Teresina may be related to the fact that many users of the Clinical School are undergraduate courses of higher education institution, which is linked to clinic.

The measurement of waist circumference is a parameter widely used to identify the distribution of body fat.[14] Findings of this study show an association between increased and very increased waist circumference and the male, which was 1,98 times more frequent. Similar results were found in a study developed with employees of a private university in São José do Rio Preto (SP) in 2009, where the frequency of increased waist circumference was 1,96 times higher among men.[15] Differently, in a study of workers at a Bahia hotel, increased waist circumference in about a third of adults of both genders.[12]

The circumference of the waist found in Teresina can be explained partly by the fact that most of the sample is composed of young women, who often are more concerned with their appearance. Furthermore, it is known that there is a natural tendency to occur an increase in waist circumference as time goes by, with the aging of the individual, due to changes in body composing.[16]

Overweight and obesity has been observed frequently in adults of all income groups and in all regions. According to data from the Family Budget Survey (POF) 2008-2009, the prevalence of malnutrition has declined, and obesity has increased in Brazil, setting early in the population, creating serious risks for the emergence of non-transmissible chronic diseases (NTCD).[1]

In adults of the urban area of Teresina-PI, study evaluating overweight and central adiposity in 464 adults showed prevalence of overweight and obesity according to BMI, respectively, 30% and 7,7%, with the highest proportion of overweight and obesity among men.[17] In the present study were identified higher overweight and obesity ratios. It seems that the difference in results is justified by the fact that they constitute different samples, and the study mentioned included the adult population of the capital of Piauí, while the present study addressed a group of adults who received nutrition service of a medical school, possibly motivated by dissatisfaction with body weight.

It is important to notice that, although the BMI above 30 kg/m² serve as a criterion to define obesity in populations, their use should be cautious, because this index actually does not measure the excessive fat mass.[18]

To enable more accurate evaluation of the study, in addition to the use of anthropometric parameters weight, height and BMI, was also carried out assessment of body composition by BIA, which revealed that approximately three-quarters of adults had fat percentage classified as "high risk" obesity. These results can be explained, at least in part, by the consumption of energy, lipids, carbohydrates and proteins above the recommended, found in most of the participants. Thus, in this study it was observed that the average daily energy intake was 1.926 kcal, being classified as above the recommended for more than two-thirds of the participants.

By comparing the results obtained with those found in other studies, it was perceived that a survey conducted in São Paulo-SP, with teachers of both genders, found excessive consumption of lipids and proteins in both genders and carbohydrate intake below the recommended level.[19] Although this study has not been conducted with teachers, we tried to make a comparison taking into account some similar characteristics between participants of both studies, such as age and the methodology for assessment of food consumption. On the other hand, in a study developed in São Paulo-SP, involving 1,660 individuals with average of 37,8 years, in which 43,2% of participants were male, carbohydrate intake was within the recommended amount, while consumption lipids and proteins was above recommended.[20]

It is important to highlight, as limitations of this research: the sample size, the fact that most of it was made up of women, and also the level of physical activity to assess the adequacy of food consumption has not been considered. Furthermore, in relation to the characteristics of the participants, it is understood that, in the case of adults who sought for care nutrition possibly have had any dissatisfaction with body image and/or health concerns.

Thus, there is the need to develop other studies to deeper analyze the aspects related to nutritional status and dietary intake of adults, which may include the assessment of biochemical parameters and qualitative assessment of the consumption of macronutrients and micronutrients.

CONCLUSION

Among the participants of the study there was no relation of food consumption with overweight, although the analysis of the adequacy of consumption has shown that this was above recommended for energy and macronutrients for most participants. However, considering the inadequacies found in food consumption, there is the need for continuous education actions, to correct bad eating habits and promote a healthy lifestyle, based on proper eating habits and regular physical activity, in order to promote weight control and body adiposity.

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