170 - RELATION BETWEEN FAT BODY, WAIST, BMI, AND AGE

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Antropometrics index such as Bomdy Mass Index (BMI), waist circumference (WC), and Fat Body (FB) have use for analise an association between adiposity and risk factor cardiovascular (MAFFEIS et al., 2001; THOMAS et al., 2007). The standard of distribution of adiposity tissue, independent of body fat total, alter the risks for a health induce for obesity (BERNARDES et al., 2003). Researchs introduce to the distribuition of fat is very important to predict an risks factors which an fat % (DANIELS et al, 1999).

To measure na abdominal adiposity have if use WC. Any studies have show that individuals with high values of WC and BMI have high risks of to develop cardiovasculars and metabolics diseases (LEE et al., 2006; ZHU ET al., 2004). Studies suggest what WC can be best predict of cardiovascular diseases as to BMI (LEE et al, 2006). In according of KUK et al (2005) an age and a sex can to have influence on the fat body distribuition.

Several studies presence significant correlation between BMI and some antropometrics variables (Sami et al, 2006). Correa et al (2003) present in your study, to analise adults of both sex, that BF have positive correlation with BMI (r= 0,71; p= 0,000) and WC (r= 0,49; p= 0,001). In research with olders demonstration to a BMI and WC present strongh correlation with a total fat % (r=0,73; $p < 0,05$; r=0,61; $p < 0,01$, respective) and with trunk fat % (r=0,71; $p < 0,05$; r=0,64; $p < 0,01$, respective)(GOMES et al., 2006).

In schoolchilds at 6 and 10 years old, Guigliano e Melo (2004) find significant correlation between BMI and BF in boys ($p < 0,02$; r = +0,843) and girls ($p < 0,02$; r = +0,774); and between BMI and WC in boys ($p < 0,02$; r = +0,884) and girls ($p < 0,02$; r= +0,892).

This study have for objective to analise a relation between BMI, BF, WC, and age in adults and childrens of both sex.

METODOLOGY

Subject:

They were appraised 438 subjects, of these 284 they were adult and 154 children. Of the adult group they understood 188 individuals female and 96 male, they were included in that group all of the individuals with superior age or same to 18 years. Of the group child they understood 108 girls and 46 boys, they were included in that group all of the individuals with inferior age to 18 years. The adult subjects varied in the age between 18 and 70 years and the children among 5 to 17 years, already for BMI the adults varied between 15 and 42 and the children between 13,6 and 31,6. the sample was composed by individuals of two evaluations accomplished by the Project of Evaluation and Prescription of Physical Exercise of UFPR, 208 individuals of the evaluation accomplished with swimmers of Barra of the South in Santa Catarina in the summer of 2007 and 249 of the evaluation accomplished in the Fair of Courses and Professions of UFPR in the years of 2005 and 2006.

Antropometrics Measures:

The stature was measured in centimeters (cm), with a fastened measuring tape the wall, the measurement was made at the end of a maximum inspiration, the barefoot individual and with the united feet, the head in the horizontal plan of Frankfurt. They were obtained three measures and considered the medium value among them.

The weight was checked with the use of a Full digital scale, accurately of 100g, the barefoot subject and with bath clothes, it arose in the scale with the two parallel feet. Three measures were accomplished and calculated her measured among the values. BMI was defined about weight / height^2 and expressed in Kg/m^2.

To check the cutaneous folds it was used adjust Cescorf. In adults the following folds were measured: triceps, subescapular, suprailíac, abdominal and thigh. In children the triceps folds, subescapular, suprailíac and leg were measured. Three measures were accomplished and considered the medium value.

For the calculation of the percentile of fat Faulkner's protocol was used (1968) for men and Jackson et al (1980) for women, and protocol of Slaughter et al. (1988) for the children.

For the measure of the waist circumference a measuring tape of the type was used Gulik, tends as anatomical reference the positioning of the ribbon on the umbilical scar.

Analyze statistics:

All of the statistical analyses were accomplished in the program STATISTICA software version 6.0. The variables were described as group, it measured and deviation pattern. The relationship among the variables was investigated through the correlation of Pearson with significative level in $p < 0,05$

RESULTS

Table 1. Sujects' caracteristics of adults group for sex.

Group	Age	Heigth	Weight	Waist	BMI	% Fat
Women (n=188)	31,5 ±12,7	1,61 ±0,07	59,8 ±10,2	81,2 ±11,7	23,1 ±3,8	25,9 ±6,1
Men (n=96)	29,2 ±12,5	1,74 ±0,06	74,1 ±12,1	85,2 ±11,0	24,6 ±3,5	15,7 ±4,5

As it can be verified in the table 1 the indicators antropométrics appear for values considered normal and appropriate for the pattern of the Brazilian adult population so much for the masculine sex as feminine.

Table 2. Sujects' caracteristics of children group for sex.

Group	Age	Heigth	Weight	Waist	BMI	% Fat
Girls (n=108)	14,7 ±2,8	1,58 ±0,11	50,7 ±10,8	72,1 ±7,4	20 ±2,7	21,2 ±6,8
Boys (n=46)	15,6 ±2,6	1,71 ±0,14	65,8 ±13,6	78,7 ±7,3	22,1 ±3,2	19,3 ±10,1

A little different from the adult population, the children's group and adolescents presented indicators of corporal composition a little high for the age group. The prevalence of the overweight seems to be more concentrated among the male individuals, corroborating with tendencies observed in the Brazilian population.

Table 3. Pearson's correlation for group women.

	Age	Waist	BMI	% Fat
Age	1	0,61235	0,533384	0,358923
Waist	**0,61235**	1	0,869169	0,65258
BMI	**0,533384**	**0,869169**	1	0,730076
% Fat	**0,358923**	**0,65258**	**0,730076**	1

A little different from the adult population, the children's group and adolescents presented indicators of corporal composition a little high for the age group. The prevalence of the overweight seems to be more concentrated among the male individuals, corroborating with tendencies observed in the Brazilian population.

Analyzing them fixing tables 3 and 4 is verified that the largest correlations were observed among the indicators antropométrics in the men, although you value very significant they were found in the women. Among them a correlation medium, but also significant was verified when associates the indicators antropométrics with the age. Association a little weaker it was also found for the men.

Table 4. Pearson's correlation for group men.

	Age	Waist	BMI	% Fat
Age	1	0,5444764	0,40964695	0,430772588
Waist	**0,544476**	1	0,90570699	0,845787258
BMI	**0,409647**	**0,90570699**	1	0,808656389
% Fat	**0,430773**	**0,84578726**	**0,80865639**	1

Unlike the adult population, among the girls it was not observed such strong, although significant correlation values. When associated the age to the indicators of corporal composition, the observed correlations were very weak, as it can be observed in the table 5.

Table 5. Pearson's correlation for group girls.

	Age	Waist	BMI	% Fat
Age	1	0,330903	0,336124	0,197902
Waist	**0,330903**	1	0,73583	0,333129
BMI	**0,336124**	**0,73583**	1	0,535589
% Fat	**0,197902**	**0,333129**	**0,535589**	1

Among the boys the results were very different from the other groups. No association was found for age, meantime in what it concerns to the indicators antropometrics, strong and significant correlations were observed, besides in a very similar proportion to the adult men's group.

Table 6. Pearson's correlation for group boys.

	Age	Waist	BMI	% Fat
Age	1	-0,01696139	0,15749277	-0,258266414
Waist	-0,01696	1	0,85321568	0,743215342
BMI	0,157493	**0,85321568**	1	0,659879554
% Fat	-0,25827	**0,74321534**	**0,65987955**	1

CONCLUSION

It is concluded observing that the indicators antropométrics should be used with certain caution and such use owes if to give the objective of the approach accordingly as well as according to the group.

Among the men a larger tendency is observed the prevalence of the overweight and obesity, besides with associations with the age, unlike the feminine population that, when it presents this association the same feels in a weaker intensity.

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RELATION BETWEEN FAT BODY, WAIST, BMI, AND AGE

ABSTRACT

The objective of this work was to analyze the relationship among waist circumference (WC), percentile of fat (%F), age and body mass index (BMI) in adults and children of both sexes. It is a study descriptive correlacional, where they were appraised 438 subjects, of these 284 they were adult and 154 children. The variables of corporal mass (kg), stature (cm), perimeter of the waist (cm), cutaneous folds were measured and later it was calculated BMI, WC and %F using Faulkner's protocol (1968) for men, Jackson et al. (1980) for women and for children the protocols of Slaughter et al. (1988). To identify the relationship among the variables antropométrics the correlation of Pearson it was used, being adopted a level of significative of p <0,05. The results demonstrated that BMI presented a strong correlation with the %F, WC and age in the adults' group. For the children's group, the girls presented significant correlation among all the variables away as high as in adults, already in the boys there was significant correlation just between BMI and WC and %F and WC and% G. Like this, is ended that BMI and WC can be used in the diagnosis of excess of corporal fat, because they presented a good correlation with the% G and another measured antropométrics.
KEY-WORDS: antropometrics indicators, overweight, body composition

RESUMÉ

L'objectif de ce travail était analyser le rapport parmi circonférence de la taille (CT), centile de graisse (% G), âge et index de masse corps (IMC) dans adultes et enfants des deux sexes. C'est une étude correlacional descriptif où ils ont été estimés 438 sujets, de ces 284 ils étaient adultes et 154 enfants. Les variables de masse du caporal (kg), taille (centimètre), périmètre de la taille (centimètre), les plis cutanés ont été mesurés et plus tard il a été calculé IMC, CT. et %G qui utilise le protocole de Faulkner (1968) pour les hommes, Jackson al de l'et. (1980) pour les femmes et pour les enfants les protocoles d'al de l'et de la Tuerie. (1988). identifier le rapport parmi l'antropométrics des variables la corrélation de Pearson il a été utilisé, être adopté un niveau de significative de p <0,05. Les résultats ont démontré ce IMC a présenté une corrélation forte avec le %G, CT et âge dans le groupe des adultes. Car le groupe des enfants, les filles ont présenté loin la corrélation considérable parmi toutes les variables aussi haut que déjà dans les garçons il y avait la corrélation considérable dans les adultes, seulement entre IMC et CT et %G et CT et %G. Like ce, est terminé que IMC et CT peuvent être utilisés dans le diagnostic d'excès de graisse du caporal, parce qu'ils ont présenté une bonne corrélation avec le % G et un autre antropométrics mesuré.
MOTS CLES: antropométrics mesuré, composition du corps, obésité

RESUMEN

El objetivo de este trabajo era analizar la relación entre la circunferencia de cintura (CC), percentil de grasa (%G), edad y índice de masa de cuerpo (IMC) en los adultos y niños de ambos sexos. Es un estudio correlacional descriptivo dónde ellos se estimaron 438 asuntos, de estos 284 ellos eran adultos y 154 niños. Las variables de masa corpórea (el kg), estatura (el centímetro), perímetro de la cintura (el centímetro), los pliegues cutáneos eran moderados y más tarde era IMC calculado, CC y %G que usa el protocolo de Faulkner (1968) para los hombres, Jackson et al. (1980) para las mujeres y para los niños los protocolos de al de et de Matanza. (1988). identificar la relación entre el antropométrics de las variables la correlación de Pearson él fue usado, adoptándose un nivel de significative de p <0,05. Los resultados demostraron ese IMC presentó una correlación fuerte con el %G, CC y edad en el grupo de los adultos. Porque el grupo de los niños, las muchachas presentaron la correlación significante lejos entre todas las variables tan alto como en los adultos, había correlación significante ya en los muchachos sólo entre IMC y CC y %G y CC y %G. Like esto, se acaba que pueden usarse IMC y CC en el diagnóstico de exceso de grasa corpórea, porque ellos presentaron una correlación buena con el% G y otro antropométrics moderado.
PALABRAS CLAVE: antropométrics, corporal del composicion, obesidad

RELAÇÃO ENTRE GORDURA CORPORAL, CIRCUNFERÊNCIA DE CINTURA, IMC E IDADE.

RESUMO

O objetivo deste trabalho foi analisar a relação entre circunferência de cintura (CC), percentual de gordura (%G), idade e índice de massa corporal (IMC) em adultos e crianças de ambos os sexos. Trata-se de um estudo descritivo correlacional, onde foram avaliados 438 sujeitos, destes 284 eram adultos e 154 crianças. As variáveis de massa corporal (kg), estatura (cm), perímetro da cintura (cm), dobras cutâneas foram mensurados e posteriormente calculou-se o IMC, a CC e o %G utilizando o protocolo de Faulkner (1968) para homens, Jackson et al. (1980) para mulheres e para crianças o protocolo de Slaughter et al. (1988). Para identificar a relação entre as variáveis antropométricas utilizou-se a correlação de Pearson, adotando-se um nível de significância de p < 0,05. Os resultados demonstraram que o IMC apresentou uma forte correlação com o %G, CC e idade no grupo de adultos. Para o grupo de crianças, as meninas apresentaram correlação significativa entre todas as variáveis embora não tão alta como em adultos, já nos meninos houve correlação significativa apenas entre IMC e CC e %G e CC e %G. Assim, conclui-se que o IMC e a CC podem ser utilizados no diagnóstico de excesso de gordura corporal, pois apresentaram uma boa correlação com o %G e outras medidas antropométricas.
PALAVRAS-CHAVE: indicadores antropométricos, sobrepeso, composição corporal.