

14 - EVALUATION OF BODY COMPOSITION IN ELDERS OF BOTH GENDER

BÁRBARA CAMPOS DE SIQUEIRA, AGNALDO DE OLIVEIRA CARDOSO JUNIOR,
RODRIGO EMMANUEL SABBAG DA SILVA,
AMANDA VERONICA SOUZA, GUILHERME RODRIGUES DOS SANTOS,
FÁBIO RODRIGUES JOSÉ, CRISTINA PROTA, EDUARDO VICTOR PIANCA,
DANIEL ROGÉRIO DE MATOS JORGE FERREIRA, ALEXANDRE SABBAG DA SILVA
Universidade Presbiteriana Mackenzie, São Paulo, São Paulo, Brasil,
email:basiqueira18@gmail.com

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Introduction

The increase of elders on the Brazilian population entices a discussion about life quality among that age range. The biological changes that are associated to aging represent a decrease in the autonomy associated to elders, making them more relying, due to a decrease in functionality of the musculoskeletal, cardiorespiratory, nervous and renal system's and endocrinal alterations as well as body composition changes. (ACSM, 2001; WHO, 2002).

The lack of investments on health promotion and physical activity promotion on elders can result in an increase on chronic degenerative diseases, being those the Coronary heart disease, hypertension, diabetes, osteoporosis, sarcopenia, malnourishment, obesity, anxiety, some types of cancer, depression and insomnia (MAZO, 2006).

The anthropometric indicator is essential for geriatric evaluation, even though some changes that happen with aging can compromise the precision of the anthropometric evaluation, if specific adaptations aren't made to minimize or neutralize these alterations over the evaluation (MCARDALE, 2011).

Therefore, even though it isn't diagnosing the nutritional state, the utilization of anthropometric measures to identify the distribution of body fat is fundamental on evaluating the risks of diseases associated with obesity (SEIDELL et al., 2001).

The waist-hip ratio (WHR) is a common and accessible form to estimate the distribution of bodyfat that indicates central obesity, which is the most prejudicial form of fat adiposity and the most common measure used to provide information to the cited diseases; WHR = measurement of the waist/ measurement of the hip (BRAY; GRAY, 1988).

The objective of the research was to evaluate the body composition of elders inserted in a regular physical activity program at the city of Guarulhos.

Materials and methods

This is a descriptive cross-sectional study, conducted at Guarulhos University in the Multidisciplinary Physical Education Laboratory. Approved by the Research Project Analysis Ethics Committee (CAPPesq) of the Clinical Board of Hospital das Clínicas and the School of Medicine of the University of São Paulo (FMUSP). All participants signed the Informed Consent Form (ICF).

We evaluated 450 female and 46 male elderly, totaling 496 elderly.

The studied population was constituted of elders from both genders over 60 years old who lives in the city of Guarulhos and were part of the physical activity program from the Sports secretaty, realizing physical activity twice a week. The exercises made stretches, running, Pilates, yoga, gymnastics, bodybuilding, postural exercises, dance, specific exercises for glutes and abdominals, judo, karate, kickboxing, adapted recreative volleyball and Zumba.

The anthropometric and body composition variables were: BMI (body mass exam), waist circumference (WC), waist-hip ratio (WHR), body fat percentage (BF%) utilizing the technique of 7 skin folds. (BRAY; OMS, 1995, 1997; JACKSON, 1978; GRAY 1988; POLLOCK)

In order to calculate the (BMI) the mass was assessed through a digital scale from the brand Kratos with maximum capacity of 150Kg. The height was measured in a wood stadiometer fixed to a wall and to the ground. The World Health Organization (WHO) grading was utilized, comparing the BMI to the diseases associated to obesity being those chronic degenerative diseases (WHO, 1997).

The measurement of WC has been proposed as one of the best anthropometric measurements of visceral fat (WHO, 1997; SEIDELL et al., 2001).

This measurement was made with an anthropometric tape measure from the brand Sanny, and was verified between the lower ribs and the iliac crests with the lower limbs (LL) adducted. The reading was made on the exhalation (WHO, 1997).

For the data analyzes it was utilized the grading indicated by the WHO, correlating the WC to diseases associated to obesity being those chronic degenerative diseases (WHO, 1997).

Another indicator that was broadly utilized on the evaluation of fat distribution was the waist-hip ratio (WHR) (SEIDELL, 1988). The measurement of the hip was made on the pubic symphysis level, with the tape scale around the hip on the biggest circumference in between the hip and the leg with the inferior limbs abducted and the individual wearing thin clothes, the reading was made on the closest millimeter (BRAY; GRAY, 1988).

On the waist-hip ratio the diseases associated to obesity being those the chronic degenerative diseases, was used the Bray and Gray Rating (BRAY; GRAY, 1988).

The BF% test was utilized on the skin folds, they were evaluated with an adipometer from the brand Cercof with it is measurement precision being at millimeters utilizing the Pollock and Jackson protocol (POLLOCK; JACKSON, 1978).

The skin folds that were utilized on evaluation were the suprascapular, pectoral, medial axillary, supra iliac, abdominal and thigh. There were made 3 of these measurements on each skin fold with a 1 minute break and for reference it was used the average of these measurements. The result was calculated by the Pollock and Jackson protocol equation calculating the body fat percentage.

A statistical analysis of the study deals with a descriptive analysis, a report using mean and standard deviation, frequency and percentage.

Results

A total of 496 elders were part of the research, being the 450 woman 91% of the total of elders on the study, and the 46 males made 9% of the total.

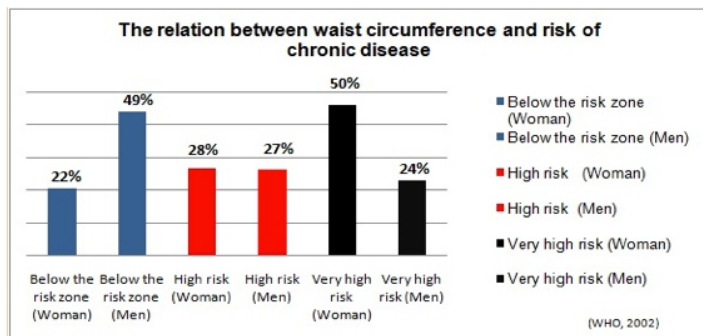
In relation to the age and body composition of the elders involved on the study, the data is better shown on the first table. Table 1: Age description and anthropometric of the elders entered in a exercise program at the city of Guarulhos.

	Woman M(dp)	Men M(dp)
Age (years)	67,1 (6,3)	69,9(6,6)
Body Mass (Kg)	66,8(11,5)	75,7(13,0)
Stature (cm)	154(0,07)	165(0,07)
BMI (kg/m²)	28,3(5,0)	27,7(4,4)
WC (cm)	87,8(10,3)	96,4(10,3)
HC (cm)	101,3(9,9)	98,7(7,5)
WHR (cm)	0,88 (0,3)	0,98(0,07)
Body Fat (%)	30,7(6,0)	28,3(6,4)

Subtitle: BMI – Body mass index; WC – Waist circumference; HC – Hip circumference; WHR – Waist hip-ratio.

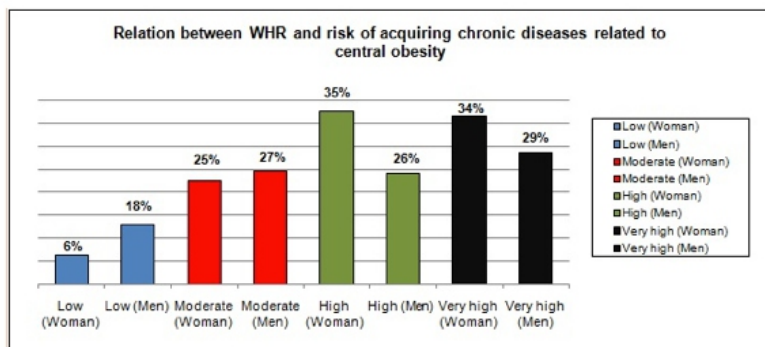
Regarding WC, women presented 50% of the total classified at very high risk and men 24%, presenting a risk of acquiring chronic diseases related to obesity according to the World Health Organization. (WHO, 1997). (Figure 1).

Figure 1: frequency distribution of WC and risk of chronic diseases in the elders.



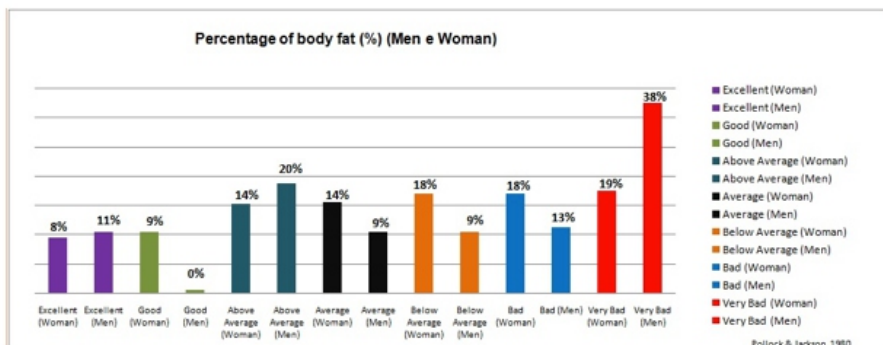
Regarding WHR, women presented 34% of the total classified as very high risk and men 29%, presenting a risk of acquiring chronic diseases related to obesity. (BRAY; GRAY, 1988). (Figure 2).

Figure 2: frequency distribution of WHR and risk of chronic diseases in the elderly.



Regarding the skin fold test, women presented 37% as inadequate, classified 18% bad and 19% very bad. Men presented 51% inadequate, classified 13% bad and 38% very bad, presenting a risk of acquiring chronic degenerative diseases related to obesity. (POLLOCK; JACKSON, 1980). (Figure 3).

Figure 3: frequency distribution of % body fat test using the skinfold technique in the elders.



Discussion

In our results, females had the worst BMI scores, being 34% obese and men with 26% obese, therefore, females are the most susceptible group to chronic diseases associated with obesity according to the World Health Organization. (WHO, 1995). According to the literature, in comparison with gender, the studies converge with our findings, with females having the

worst BMI score, with a percentage between 36% and 40% obese and men between 9% and 26%. (SILVA et al., 2013; DÓREA, 2015; SANTOS; REBELATTO; FALSARELLA et al., 2015; KIM et al., 2017).

Surveys of elders who do not exercise showed a worse score with women 50% to 60% classified as obese and men between 30% to 40%. (ROSAB; SOUZAC, 2006; MASTROENI et al., 2010; SILVA et al., 2013; DÓREA, 2015).

In the WC test, regarding gender, it was found that woman had the worst result with 50% of elders women classified as very high risk and men had 24%. According to the WHO waist circumference (WC) cut-off points (2002), half of the elderly women surveyed presented WC with a very high risk of acquiring obesity-related pathologies, corroborating the literature where WC measurements, comparing genders, showed similar data, and women had an inadequate result between 54% and 71% being classified as very high risk (FÉLIX; SOUZA, 2009; SANTOS; OLIVEIRA et al., 2013; DÓREA et al., 2015), which according to the researchers there is a higher risk of cardiovascular disease. (FÉLIX; SOUZA, 2009; OLIVEIRA et al., 2013).

In relation to the WHR comparing females to males showed the worst result for women with 34% presenting >0.90 and men obtaining 29% with >1.03 classified at very high risk (WHO, 1997). According to research that evaluated elderly physical exercise practitioners found results similar to ours, with women with a worst score between 29% and 48% classified as very high risk and men between 30% and 35% (SANTOS; MASTROENI et al., 2012; OLIVEIRA et al., 2013; SILVA et al. 2015). Surveys of elder people who do not exercise also found that women had the worst score with 50% to 71% rated very high risk and men between 30% to 50%. (BENEDETTI et al., 2012).

The results of the WHR and WC tests were better related to diseases already installed in the elders than the BMI test alone, being the best evaluation for disease diagnosis. (TINOCO et al., 2006; BENEDETTI et al., 2012).

One of the hypotheses for the increase of body perimeter in the central region, especially in women, refers to some behavioral changes that are characteristic in this population, such as the reduction in physical activity levels and an unbalanced diet, which contribute to the accumulation of fat. (MOREIRA et al., 2009; KROGH et al., 2017).

The evaluation of skinfolds to measure %BF comparing genders, men showed the worst score with 60% classified as inadequate and women obtained 55%. These values are high and are considered a risk of acquiring obesity-related pathologies. (POLLOCK; JACKSON, 1978).

Comparing studies regarding %BF between genders, the results were contrary to current findings, with women with a worst score between 40% and 50% classified as %BF inadequate and men between 30% and 45% classified as %BF inadequate (BENEDETTI et al., 2012; MASTROENI et al., 2012; FRAGALA et al., 2012; OLIVEIRA et al., 2013; FALSARELLA et al., 2015; SILVA et al., 2015). One justification for the %BF evaluation has shown a different result from the general data from the study in which females had the worst results is that the skinfold measurement technique to assess body fat in an elderly population is that fat is centralized and internalized over the years, and anthropometry is based on the principle that subcutaneous tissue fat is representative of total fat and may thus underestimate fat mass in these individuals. (LERARIO, 2002).

Limitations of the study are related to the multidimensional aspect that is obesity, but anthropometric parameters and body composition are important aspects to be measured and are the most evident, which may help to draw the attention of these elderly to self-care.

The clinical importance of the study is related to the increase in obesity worldwide even the active elderly presented better anthropometric data in relation to the elderly not practicing physical activity and consequently lower risk of acquiring chronic non-communicable degenerative diseases, the data described in the literature in relation to the elderly. Physical activity practitioners show a high number of individuals classified as obese and at risk of health problems. Therefore, the issue of obesity and its health risks in the elderly population is a public health issue that should be addressed by interdisciplinary health teams to better address this condition.

Conclusion

The elders had a self-index of obesity, especially of central fat, which offers a higher risk of acquiring noncommunicable degenerative chronic diseases, influencing the increase in morbidity and mortality. Although they are part of a physical activity program, other professionals need to act to prevent obesity and consequently chronic noncommunicable diseases.

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Abstract

Introduction: The increase of elders on Brazilian population enticed a discussion about life quality and degenerative diseases among this population. **Objective:** Evaluate the physical composition of elders who were put on a physical activity program at the city of Guarulhos. **Materials and methodology:** The population studied were elders over 60 years old, being 450 woman and 46 men, totaling 496 subjects who exercised twice a week. The anthropometric variables from the physical composition evaluated were the BMI (body mass index), waist circumference (WC), waist-hip ratio (WHR) and bodyfat percentage (BF%). **Results:** Regarding BMI, females had the worst scores, being 34% obese and men with 26% obese. The CC test found that women had the worst result with 50% of the elderly women at very high risk and men with 24%. Comparing females with males on the RCQ test, it showed the worst outcome for women with 34% classified at very high risk and men with 29%. In the % CG test comparing genders, men showed the worst score with 60% classified as inappropriate and women obtained 55%, presenting a risk of acquiring chronic degenerative pathologies. **Conclusion:** Females had the worst scores and body fat was more localized in the abdominal region, being the anatomical site that indicates the greater susceptibility of these elderly women to chronic non-transmissible degenerative diseases.

Key words: Health Services for the Aged, Anthropometry, Disability Evaluation.

ÉVALUATION DE LA COMPOSITION CORPORELLE D'HOMMES ET DE FEMMES ÂGÉES**Résumé**

Introduction: L'augmentation des personnes âgées au Brésil apporte la discussion concernant la qualité de vie et les maladies dégénératives dans cette population. **Objectif:** Évaluer la composition corporelle des personnes âgées insérées dans un programme d'activité physique dans la ville de Guarulhos. **Matériels et Méthodes:** La population étudiée a été âgée au-dessus de 60 ans, étant 450 appartenant au sexe féminin et 46 au sexe masculin, totalisant 496 réalisant des exercices physiques 2 fois par semaine. Les variables anthropométriques de la composition corporelle évaluées ont été l'indice de masse corporelle (IMC), circonférence de taille (CC), relation taille hanche (RCQ) et pourcentage de graisse corporelle (%GC). **Résultats:** Concernant l'IMC, les femmes avaient les pires scores (34% présentait de l'excès de poids) et les hommes 26% présentait de l'excès de poids. L'essai CC a montré que les femmes avaient le pire résultat avec 50% des femmes âgées étaient classées ayant un risque très élevé et les hommes avec 24%. Concernant RCQ, les femmes avaient les pires scores avec 34% ont été classées ayant un très haut risque et les hommes avec 29%. Dans l'essai de % GC, les hommes présentaient le score le plus défavorable avec 60% classés comme inadéquats et les femmes 55% présentant risque d'acquies des pathologies chroniques dégénératives. **Conclusion:** Les femmes présentaient les pires scores et la graisse corporelle la plus élevée a été localisée dans la région abdominale étant le lieu anatomique qui indique la plus grande susceptibilité des personnes âgées aux maladies chroniques dégénératives non transmissibles.

Mots-Clés: Services de Santé pour Personnes Âgées, Anthropométrie, Évaluation de l'Insuffisance

TEST DE COMPOSICIÓN CORPORAL DE PERSONAS MAYORES EN AMBOS SEXOS**Resumen**

Introducción: Con el incremento en la expectativa de vida de la población en el Brasil el número de personas mayores de 60 años ha aumentado, fomentando la discusión referente a la calidad de vida y enfermedades degenerativas en esta población. **Objetivo:** Evaluar la composición corporal de personas mayores en un programa de actividad física en la ciudad de Guarulhos. **Materiales y métodos:** Se estudiaron personas mayores de 60 años siendo 450 del sexo femenino y 46 masculino totalizando 496 personas. Éstos realizaron ejercicios físicos dos veces por semana. Las variables antropométricas de composición evaluadas fueron índice de masa corporal (IMC), circunferencia de cintura (CC), índice cintura cadera (IC-C) y porcentaje de grasa corporal (%GC). **Resultado:** En relación al IMC el sexo femenino presentó los peores resultados, 34% de obesas en comparación con 26% de hombres obesos. El test CC demostró que las mujeres obtuvieron el peor resultado con 50% clasificadas en riesgo muy elevado y los hombres con apenas 26% en esa clasificación. Comparando el sexo femenino y el masculino en el test RCQ, las mujeres registraron el peor resultado, con índices de 34%, clasificado un riesgo muy alto, en contraposición con los hombres que demostraron índices de 29%. En el test IC-C, comparando los sexos, los hombres demostraron los peores scores con 60% clasificados como inadecuados y las mujeres con 55%, presentando riesgo de adquirir patologías crónicas degenerativas. **Conclusión:** El sexo femenino demostró los peores resultados y la gordura corporal fue mayoritariamente localizada en la región abdominal, siendo este, un local anatómico que indica mayor susceptibilidad de esas señoras a enfermedades crónicas degenerativas no transmisibles.

Palabras clave: Servicio de salud para personas mayores, antropometría, prueba de deficiencia.

AVALIAÇÃO DA COMPOSIÇÃO CORPORAL DE IDOSOS DE AMBOS OS SEXOS**Resumo**

Introdução: O aumento de idosos no Brasil traz a discussão a respeito da qualidade de vida e doenças degenerativas nessa população. **Objetivo:** Avaliar a composição corporal de idosos inseridos em um programa de atividade física na cidade de Guarulhos. **Materiais e Métodos:** A população estudada foram idosos acima de 60 anos, sendo 450 do gênero feminino e 46 do masculino, totalizando 496 que realizam exercícios físicos duas vezes por semana. As variáveis antropométricas da composição corporal avaliadas foram índice de massa corporal (IMC), circunferência de cintura (CC), relação cintura quadril (RCQ) e porcentagem de gordura corporal (%GC). **Resultados:** Em relação ao IMC o sexo feminino apresentou os piores scores, sendo 34% de obesas e os homens com 26% de obesos. O teste CC verificou-se que as mulheres obtiveram o pior resultado com 50% das idosas classificadas em risco muito elevado e os homens com 24%. Comparando o sexo feminino com o masculino no teste RCQ, demonstrou o pior resultado para as mulheres com 34% classificados em risco muito alto e os homens com 29%. No teste de % GC comparando sexos, os homens demonstraram o pior score com 60% classificados como inadeguados e as mulheres obtiveram 55%, apresentando risco de adquirir patologias crônicas degenerativas. **Conclusão:** O sexo feminino apresentou os piores scores e a gordura corporal foi mais localizada na região abdominal, sendo o local anatómico que indica a maior suscetibilidade dessas idosas às doenças crônicas degenerativas não transmissíveis.

Palavras-chave: Serviços de Saúde para Idosos, Antropometria, Avaliação da Deficiência.