

## 08 - EVALUATION OF PHYSICAL COMPOSITION OF ELDERLY FROM GUARULHOS CITY

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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

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

There were evaluated 450 woman and 46 men, totaling 496 elders. The study was made at the University of Guarulhos on the multidisciplinary physical education lab.

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

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's measurement precision being at millimeters utilizing the Pollock and Jackson protocol (POLLOCK; JACKSON, 1978)

The skin folds that were utilized on the 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.

### 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

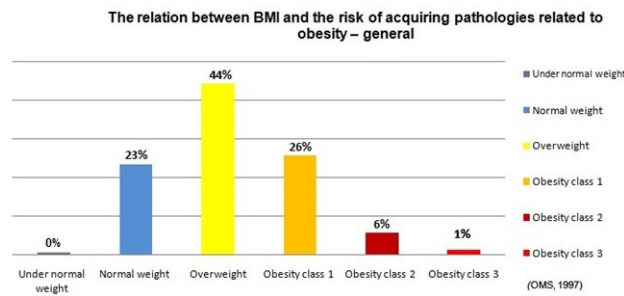
In relation to the age and body composition of the elders involved on the study, the data is better shown on the first table

Table 1: Distribution of the frequency of elders from the research according to age and body composition (General)

	Age	Weight(kg)	Height(cm)	BMI	Waistcircumference	Hip circumference	Hip-waistratio	Bodyfatpercentage%
<b>Average:</b>	67,68	67,36	1,55	28,26	88,34	100,99	0,89	30,59
<b>Normal deviation:</b>	6,21	11,81	0,07	5,03	10,63	9,81	0,31	6,13
<b>Minimal:</b>	60	36,75	1,34	18,23	47,5	72	0,57	14,79
<b>Máximum:</b>	90	118,6	1,81	85	128,5	131	7,43	43,51

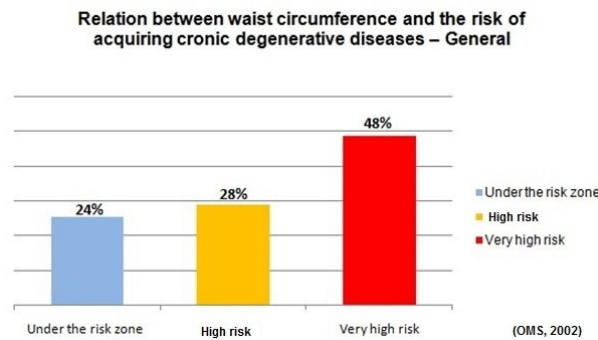
In relation to the BMI of the elders from both genders, 33% from the total of elders at the research were obese, presenting a clear risk of acquiring chronic degenerative pathologies associated with obesity according to the World Health Organization (WHO, 2002).

Figure 1: Distribution of BMI frequency among the elders who participated on the research



In relation to the waist circumference data, 48% of the total of elders from both genders were evaluated at very high risk, latter presenting a risk of acquiring chronic degenerative diseases according to the World Health Organization (WHO, 1997)

Figure 2: distribution of waist circumference frequency among elders who participated on the research



In relation to the hip-waist ratio from the elders from both genders, 34% of the total of elders who participated on the research were classified as very high risk, latter being more susceptible to acquiring chronic degenerative diseases related to obesity (BRAY; GRAY, 1988)

Figure 3: Frequency distribution of WHR from the elders who participated on the research

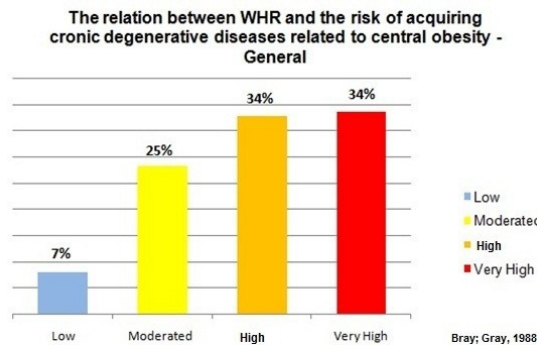
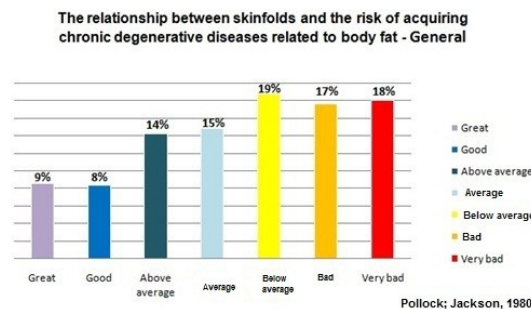


Figure 4: frequency distribution of the BF% test utilizing the technique of skin folds on the elders who participated on the research.



**Discussion**

Our findings have shown that elders from both genders presented a high percentage of obese among the BMI, 33% of the total, therefore presenting a risk of acquiring chronic degenerative diseases associated with obesity accordingly to the World Health Association (WHO, 2002).

In relation to the BMI data from the literature according to elders who practice physical activity, the data converges to our findings. The values of BMI from the researched literature presented 32% to 40% of obesity among elder’s (Santos;

SICHERI, 2005; REBELATTO et al., 2010).

Although the high rates of obesity observed in this study, these are still lower than the rates found among elder's who don't practice physical activities, as described by FRANCHI et al. (2010).

The WC test made on this work showed that 48% of elders, from both genders, were classified as very high risk of acquiring chronic degenerative diseases related to central obesity (WHO, 1995). Similar data was found on the researched literature (OLIVEIRA et al., 2013; DÓREA et al., 2015).

Even though our work hasn't correlated the WC with pathologies, the researched literature has shown a greater relation between the results of very high risk and the cardiovascular diseases (MARCOS; JACOB, 2001; TINOCO et al., 2006; OLIVEIRA et al., 2013).

The result of the current article has shown that elders from both gender were classified with WHR of 34% at very high risk, therefore having a higher chance of acquiring chronic degenerative diseases and other morbidities caused by such diseases (OMS, 1997; TINOCO et al., 2006). Similar data was found on the WHR test (MASTROENI et al., 2012).

The results from the tests of WHR and WC are described as the best tests on the relation to chronic degenerative non-transmissible diseases already present on elder's in comparison to the BMI (TINOCO et al., 2006; BENEDETTI et al., 2012)

We verified that elders from both genders were classified at the BF% at 18% (very bad), 17% (bad) and 19% (below average) similarly to the researched literature (ROSAB et al., 2006; BENEDETTI et al., 2012; OLIVEIRA et al., 2013; SILVA et al., 2015).

According to Pollock and Jackson (1978) these results (very bad, bad and below average) are considered for elder's as a risk at acquiring metabolic pathologies caused by a huge body fat accumulation.

On the data of elders who practice exercises in comparison to those elders who didn't practice physical activity regularly, the studies have shown that elders who practice exercises regularly have a lower percentage of body fat and successively a lower BMI, WC and WHR, and because of that a lower chance of acquiring chronic degenerative non-transmissible diseases (FRANCHI et al., 2010; OLIVEIRA et al., 2013; DÓREA et al., 2015; FRANCHI; CHEN et al., 2017). However, even though the anthropometric data is better in comparison to those who didn't practice physical activity regularly and they present a lower chance of acquiring chronic degenerative non-transmissible diseases, the data presented on the literature in relation to elder's who practiced physical activities have shown a great number of individuals that are classified as obese and at risk of health problems. Therefore, the obesity and it's health risks on elders is a public health question that must be addressed by interdisciplinary health teams in order to solve this condition

National studies to determine the body fat percentage on elder's are scarce, and because of it, it's necessary to expand the researches on the connection of the nutritional profile of such population, helping an early diagnose and intervention (MOREIRA et al., 2009).

### Conclusion

According to the presented work, it was concluded that there are inadequacies of the anthropometry of elders from both genders who were part of the physical activity group in the city of Guarulhos, showing a high prevalence of obesity, with most of the fat being stored on the abdominal area, being that the anatomic place that indicates a higher susceptibility on elders on developing chronic degenerative non-transmissible diseases, latter increasing the morbimortality.

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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:** in relation to the BMI, 33% of the elders were obese, being that 44% of them were overweight and only 26% of them were at normal range. The WC measure showed that 48% of them were at very high risk. Only 24% were classified as low risk subjects

In comparison to the waist-hip ratio (WHR) measurement, 34% of the elders were classified at very high risk. In the body fat percentage test (BF%) 54% were classified as below average, bad or very bad presenting risk of acquiring chronic degenerative diseases

**Conclusion:** There are inadequacies on the anthropometry of the subjects, showing a prevalence in obesity, and that most of the body fat is located at the abdominal region, being that indicates a higher susceptibility on elders on developing chronic degenerative non-transmissible diseases

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

### ÉVALUATION DE LA COMPOSITION CORPORELLE DES PERSONNES ÂGÉES DE GUARULHOS

#### 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, 33% des personnes âgées était obèse, sachant que 44% présentait de l'excès de poids et seulement 26% pesant normalement. L'essai CC a montré que 48% étaient classées ayant un risque très élevé. Seulement 24% ont été classés présentant risque bas.

Concernant RCQ 34% du total de personnes âgées étudiées dans la recherche, ont été classées ayant un très haut risque. Dans l'essai de % GC, 54% des personnes âgées ont été classées parmi-elles, au-dessous de la moyenne, mauvaise et très mauvaise condition, présentant risque d'acquérir des pathologies chroniques dégénératives.

**Conclusion:** Il y a des inadéquations de l'anthropométrie évaluées, montrant d'élévée prévalence de l'obésité, 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



**EVALUACIÓN DE LA COMPOSICIÓN CORPORAL DE ANCIANOS DE GUARULHOS**

## Resumen

Introducción: El aumento de los ancianos em Brasil trae a discusión el tema de la calidad de vida y de las enfermedades degenerativas em esta población.

Objetivo: Evaluar la composición corporal de los ancianos dentro de um programa de actividad física em la ciudad de Guarulhos.

Materiales y métodos: Las personas estudiadas fueron ancianos mayores de 60 años, siendo 450 del género femenino y 46 del masculino, totalizando 496 que realizan ejercicios físicos 2 veces por semana.

Las variables antropométricas de la composición corporal evaluadas fueron el índice de masa corporal (IMC), la circunferencia de la cintura (CC), la relación cintura cuadril (RCC) y el porcentaje de grasa corporal (%GC).

Resultados: Em relación al IMC, 33% de los ancianos eran obesos, siendo que 44% presentan sobrepeso y solamente 26% el peso normal. La evaluación CC mostró que 48% estaban clasificados como riesgo muy alto. Solamente 24% fueron clasificados como riesgo bajo.

Em relación a la RCC, 34% del total de ancianos de la presente investigación fueron clasificados como riesgo muy alto. Em la evaluación de % de GC, 54% de los ancianos fueron clasificados entre abajo del promedio, malo y muy malo presentando riesgo de adquirir patologías crónicas degenerativas.

Conclusión: Hay incompatibilidad de la antropometría de los evaluados, mostrando elevada prevalencia de obesidade, la grasa corporal fue mas localizada em la región abdominal, siendo el local anatómico que indica mayor susceptibilidad de los ancianos a las enfermedades crónicas degenerativas no transmisibles.

**Palabras-clave:** Servicios de salud para ancianos, antropometría, Evaluación de la discapacidad.

**AVALIAÇÃO DA COMPOSIÇÃO CORPORAL DE IDOSOS DA CIDADE DE GUARULHOS**

## 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 2 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, 33% dos idosos eram obesos, sendo que 44% apresentavam excesso de peso e somente 26% peso normal. O teste CC mostrou que 48% estavam classificados em risco muito elevado. Somente 24% foram classificados como risco baixo.

Em relação ao RCQ 34% do total de idosos da pesquisa foram classificados em Risco muito alto. No teste de % GC, 54% dos idosos foram classificados entre abaixo da média, ruim e muito ruim apresentando risco de adquirir patologías crónicas degenerativas.

Conclusão: Há inadequações da antropometria dos avaliados, mostrando elevada prevalência de obesidade, a gordura corporal foi mais localizada na região abdominal, sendo o local anatómico que indica maior susceptibilidade dos idosos às doenças crónicas degenerativas não transmissíveis.

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