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BODY COMPOSITION IN SEDENTARY ELDERLY WOMEN AND THE CORRELATION BETWEEN ADIPOSE TISSUE AND DEPRESSIVE SYMPTOMS

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Abstract

Twenty-five sedentary women (52 ± 4.5 years) had their body composition measured using the Tanita MC-780MA, and then completed the Depression Scale of the Center for Epidemiological Studies (CES - D). The purpose of the article was to observe if there are correlations between adipose tissue and the level of depressive symptoms. At the end of the study a positive correlation was also found between depression scale and metabolic age, $r = .75$, $p < .001$. A positive correlation was found between depression scale and visceral fat, $r = .79$, $p < .001$, and the same was found between depression scale and trunk fat ($r = .75$, $p < .001$), right arm fat ($r = .82$, $p < .001$), right leg fat ($r = 82$, $p < .001$), left leg fat ($r = .82$, $p < .001$).

Introduction

Determining body composition is an area of interest in sports science. Thus, body composition can be a good indicator for the subject's level of fitness and an indicator that can predict his health. Following a measurement of body composition, results can be obtained regarding body mass, free fat mass, muscle mass, fat mass, skeletal muscle mass, intracellular watter, extracellular water, the ratio between intracellular water and extracellular water, muscle mass in the trunk, upper limbs and lower limbs, adipose tissue of the torso, upper limbs and lower limbs [1]. When it comes to body fat (adipose tissue), it should be noted that both too low a level (less than 14% for women and less than 8% for men) and too high a level of body fat (more than 32% for women and over 25% in men) have negative effects on health. Thus, when body fat is too low, reproductive function disorders can occur and mortality can even increase among older women [2]. An increased level of body fat increases the risk for cardiovascular disease, metabolic diseases, diabetes, stroke and even osteoarthritis [3 - 7]. It is important to perform lifelong body analyzes in order to follow the evolution of the above-mentioned parameters. As previously mentioned, excess body fat increases the risk of developing cardiometabolic diseases such as obesity and type 2 diabetes, but also of cardiovascular diseases (stroke, myocardial infarction, atherosclerosis etc.). Obesity is assessed on the basis of body mass index (BMI), proposed by the World Health Organization and then adopted by the National Institutes of Health [8]. A BMI of 25.0 to 29.9 defines overweight, 30.0 to 34.9 defines class I obesity, 35.0 to 39.9 defines class II obesity and 40.0 and higher defines class III obesity (extreme) [9]. Although BMI is the most common measure of obesity, the distribution of adipose tissue is more directly related to medical comorbidities than total adipose tissue or BMI [10]. Specifically, central (abdominal) obesity, which promotes visceral adipose tissue, is more closely linked to cardiovascular disease, type II diabetes, metabolic syndrome, and hypertension than BMI or buttock / femoral adiposity [11].

Material-method

Twenty-five sedentary women (52 ± 4.5 years old) participated in the study. Subjects included in the study have not practiced exercise programs in the past 2 years. Body composition was analyzed using Tanita MC-780MA. The study participants also completed the Center for Epidemiologic Studies Depression Scale (CES - D) in order to determine the level of depressive states. The questionnaire contains 20 questions with 4 possible answers, and the results obtained for each question are collected to obtain the final score. Possible range of scores is zero to 60, with the higher scores indicating the presence of more symptomatology.

The data obtained were analyzed using SPSS v.26. The Pearson correlation was used to analyze whether there are correlations between all the parameters obtained with TANITA MC-780MA and Center for Epidemiologic Studies Depression Scale scores.

Results

A positive correlation was found between weight and fat (%), $r = .85$, $p < .001$, between weight and fat mass (kg), $r = .96$, $p < .001$. Also, a positive correlation was found between weight and FFM (free fat mass), $r = .85$, $p < .001$. A positive correlation was found between weight and muscle mass (kg), but the correlation was not statistically significant, $r = .32$, $p < .13$, but a statistically significant positive correlation was found between weight and SMM (skeletal muscle mass), $r = .69$, $p < .001$.

Table 1. Descriptive Statistics

	Min.	Max.	Mean		SD	Variance
			Statistic	Std. Error		
Age (years)	47	61	51.96	.934	4.477	20.043
Weight (kg)	51.2	110.0	80.970	3.3980	16.2962	265.565

Fat%	10.6	48.6	35.661	1.8846	9.0380	81.685
Fat Mass	5.5	51.9	30.091	2.4828	11.9071	141.778
FFM	37.7	59.6	50.917	1.1807	5.6626	32.065
Muscle Mass	26.6	54.7	47.022	1.4074	6.7498	45.560
Bone Mass	1.9	3.0	2.591	.0583	.2795	.078
BMI	19.9	43.3	31.165	1.2860	6.1675	38.038
SMM	19.8	26.9	23.500	.4160	1.9952	3.981
Metabolic Age	30	75	55.43	2.486	11.923	142.166
TBW (kg)	27.7	40.8	34.048	.7234	3.4693	12.036
TBW (%)	35.9	54.1	42.987	1.0753	5.1569	26.594
ECW	11.7	20.8	16.513	.4942	2.3703	5.618
ICW	1.8	20.1	16.883	.7514	3.6036	12.986
Visceral Fat	1	15	8.57	.751	3.603	12.984
Trunk Muscle	20.9	32.2	28.126	.6348	3.0444	9.268
Left Arm Muscle	1.6	2.9	2.339	.0656	.3144	.099
Right Arm Muscle	1.6	3.0	2.387	.0684	.3279	.108
Trunk Fat	1.0	26.4	14.483	1.3271	6.3646	40.508
Left Arm Fat	.4	11.3	2.313	.4403	2.1117	4.459
Right Arm Fat	.4	3.4	1.865	.1645	.7889	.622
Left Leg Muscle	5.8	9.2	7.713	.1831	.8782	.771
Right Leg Muscle	5.9	9.6	7.761	.1936	.9287	.862
Left Leg Fat	1.9	10.0	5.926	.4197	2.0127	4.051
Right Leg Fat	1.9	10.2	5.939	.4240	2.0333	4.134
Depression Scale	20	47	32.09	1.708	8.190	67.083

Also, a positive correlation was found between weight and bone mass, $r = .84$, $p < .001$. The higher the body weight, the higher the metabolic age tends to be, confirmed by the Pearson correlation, $r = .83$, $p < .001$. A positive correlation was also found between weight and TBW (total body water), $r = .96$, $p < .001$. A positive correlation was found between weight and ECW (extra cellular water), $r = .98$, $p < .001$, but there was no statistically significant correlation between weight and ICW (intra cellular water), $r = .35$, $p = .11$. A positive, statistically significant correlation was found between weight and visceral fat, $r = .86$, $p < .001$. Also, positive correlations were found between weight, muscle trunk, left arm muscle, right arm muscle, $r = .79$, $p < .001$, $r = .88$, $p < .001$, respectively, $r = .88$, $p < .001$. Interestingly, a correlation was found between weight and trunk fat ($r = .96$, $p < .001$), right arm fat ($r = .96$, $p < .001$), left leg fat ($r = 97$, $p < .001$).), right leg fat ($r = .96$, $p < .001$), but no correlation was found between weight and left arm fat ($r = .11$, $p = .61$). Correlations were also found between weight and trunk muscle, right arm muscle, left arm muscle, right leg muscle, left leg muscles, all correlations being statistically significant, $p < .001$. A positive correlation was also found between weight and depression scale ($r = .77$, $p < .001$).

The same was observed between fat mass (kg) and depression scale, $r = .79$, $p < .001$, which suggests that depressive states tend to be more pronounced in people who have higher fat mass.

Between depression scale and fat (%), fat mass (kg) and BMI were found positive correlations, statistically significant, $r = .71$, $p < .001$, $r = .79$, $p < .001$, respectively, $r = 85$, $p < .001$. A positive correlation was also found between depression scale and metabolic age, $r = .75$, $p < .001$. A positive correlation was found between depression scale and visceral fat, $r = .79$, $p < .001$, and the same was found between depression scale and trunk fat ($r = .75$, $p < .001$), right arm fat ($r = .82$, $p < .001$), right leg fat ($r = 82$, $p < .001$), left leg fat ($r = .82$, $p < .001$).

Conclusions

There appears to be a correlation between depressive symptoms and body fat percentage, between depressive symptoms and metabolic age, and between depressive symptoms and trunk fat, lower limb fat and upper limb fat.

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