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RELATION OF FAT AND NON-FAT BODY COMPOSITION IN WOMEN WITH X-LEG DEFORMITIES

1. INTRODUCTION

Obesity is a multi-factorial condition and includes genetic, lifestyle and socio-cultural factors (Bouchard, 1998).

Body composition is the term used to describe the different components that, when taken together, make up a person's body weight. The human body is composed of a variety of different tissue types including lean tissues (muscle, bone, and organs) that are metabolically active, and fat (adipose) tissue that is not (Brodie, D. A. 1988).

Many researchers warn that over adipose tissue represents a serious health risk. Fat metabolism disorders, increased triglyceride levels and decrease the level of cholesterol (HDLC), hypertension, diabetes type 2, cardiovascular diseases and some related diseases are associated with body overweight. Body overweight in most cases is associated with insufficient activity, which means that taken calories are not in correlation with spent calories. Also, some research suggests that excessive accumulation of fat at specific body sites may be an important health risk factor (Wilmore, Buskirk, DiGirolamo, & Lohman, 1986).

Despite the age, which is associated with significant changes in body composition, including the reduction of non-fatty body mass and adipose tissue during old-growing process, inadequate physical activity helps this change in favor of increasing the tissue adipose.

Physical deformities such as the inherited and obtained ones are also associated with the reduction of physical activities, where favorite conditions are created to cause the adipose tissue growth. Considering the deformities of the lower extremities with females are not rare deformities of the legs X. Considering this deformity the medial condoles of tibis and femur are voluminous that pushes the axis inside and compensatory leg removal. Women with such deformities should avoid long standing due to the knee pains and legs muscle fatigue. This phenomenon causes the reduction of daily physical activity which does not consume taken calories and storing them as fat in the body.

1.1. Aim of research

The purpose of this research is to determine the ratio of fatty and non-fatty quantity with women who have got the X legs deformity and comparing these parameters with the group of women without leg deformities.

2. METHODS OF WORK

2.1. Samples of students

To select a sample of 41 tested candidates with X legs deformities 2310 female students have been included in the research of five middle schools in Gjilan, such as; "Asllan Elezi", "Mehmet Isai", "Arbëria", "Marin Barleti" and Gymnasium "Zenel Hajdini.” In the research, 41 female students with X leg deformities and 41 female students without X leg deformities have been included. Total research included 82 students aged 18 and 19 years old.

2.2. The sample of variables

In the research, 6 anthropometric variables have been applied according to the International Biological Program (IBP): body weight (ABW), back skin fold (ABS), shank skin fold (ASHS), arm skin fold (AAS), lean body mass (LBM) and body fat mass (BFM). The relation between the fatty and non-fatty mass has been determined based on the formula which has been supported by many authors, like (Wilmore, J. H., E. R. DiGirolamo, M. & Lohman, T. G. 1986).

Measurement leg X is done with the millimetric ruler and the width between the feet joints, namely bimaleolar width >5cm (width bimaleolar medial >5cm) standing position, has been measured. For each anthropometric variable the following values have been calculated: 1 Central core parameters and distribution, 2. Distribution curve has been tested through asymmetry coefficient ("scewness"), and height of distribution through extension coefficient ("kurtosis"). 3. To determine whether there were differences in arithmetic averages between two the groups of women with and without deformities of legs in anthropometric parameters T-test (paired sample T-test) has been applied. Analyses were conducted by SPSS 8.0 program.

3. RESULTS AND DISCUSSION

Sample group with deformities of legs X consists of 41 women aged 18 and 19 years old. The results of the basic central, statistical and dispersive parameters are presented in table 1. The representation of the statistical-descriptive parameters in women with X leg deformities shows that from the anthropometric variables applied in this paper, body weigh (ABW), back skin fold (ABS) and lean body mass (LBM) have digression in proportion to the normal distribution.

Applied asymmetries of all the variables are positive (epicurtic), which means that the results tend to be higher. Researches of the degree of bending of the tip of the curve, represents the graph of frequency distribution functions, which means extension analysis or flattening (kurtosis - Kurt). It is obvious that most of the variables have distributions results close to the normal, mesokurtic distribution.

Table 1. *Central parameters and anthropometric variables distribution in women with deformities of legs X*

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
ABW	41	48.80	88.30	65.7634	11.01387	1.027	.288
ABS	41	6.40	34.20	15.3024	5.72671	1.208	1.793
ASHS	41	12.20	35.20	20.5732	4.31561	.807	2.394
AAS	41	6.50	27.20	14.8902	4.46272	.662	1.075
LBM	41	37.78	64.72	48.2814	7.81878	1.228	.516
BFM	41	11.62	26.78	17.9649	4.52030	.894	-.057

Table 2. *Central and distribution parameters of anthropometric variables with women with and without legs X deformities*

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
ABW	41	45.50	70.50	58.6610	6.16392	-.368	-.680
ABS	41	6.50	27.90	16.3171	4.41032	.517	.724
ASHS	41	10.40	30.10	19.9439	5.02718	.197	-.688
AAS	41	7.90	23.70	15.4195	3.74408	.217	-.070
LBM	41	34.94	50.72	43.0317	3.86875	-.290	-.573
BFM	41	9.96	19.91	15.6292	2.67112	-.279	-.671

Comparing to table 1, where the asymmetries of all variables are positive (epicurtic) which means that the results tend to be higher. In table 2 asymmetries of half of the variables are negative (hypocurtic) and it means that the values tend to be lower. Considering all the variables applied in this paper, none of them has a deviation from the normal distribution. Almost all variables that are used to determine the level of morphological development, it is seen a kind of platicurtic view of flattening - the top of the curve results.

To determine whether there is a statistically significant difference between the arithmetic average morphological parameters between women without and with deformities of legs X, the T-test for two independent groups have been applied (Table 3).

Table 3. *Differences in arithmetic average with anthropometric variables among women with and without legs X deformities*

				95% Conf. Interval of the Difference		t	df	Sig. (2-tailed)
	MeanX	MeanN	Difference	Lower	Upper			
ABWX - ABWN	65.7634	58.6610	7.10244	2.75532	11.44956	3.302	40	.002
ABSX - ABSN	15.3024	16.3171	-1.01463	-3.32687	1.29760	-.887	40	.380
ASHSX - ASHSN	20.5732	19.9439	.62927	-1.49622	2.75475	.598	40	.553
AASX - AASN	14.8902	15.4195	-.52927	-2.30295	1.24442	-.603	40	.550
LBMX - LBMN	48.2814	43.0317	5.24971	2.27329	8.22612	3.565	40	.001
BFMX - BFMN	17.9649	15.6292	2.33566	.52298	4.14834	2.604	40	.010

X= with deformities
N= without deformity

The down-mentioned research shows that difference between the two groups of X legs deformities in women is in the middle of the morphological variables especially in the variables which goal was to measure the body mass: ABW (Diff. – 7.10, t. – 3.30, df – 40, sig – 002); LBM (Diff. – 5.25, t. 3.56, df – 40, sig – 001); BFM (Diff. – 2.33, t.260, df – 40, sig – 010), as the differences in arithmetic average were in favor of women with X leg deformities, the result of the T test (df) show that women with X leg deformities differ from the women without X leg deformities in level $p < .01$ (Sig. (2 – tailed) body weight (ABW), lean body mass (LBM) and body fat mass (BFM).

Body composition is the term used to describe the different components that, when taken together, make up a person's body weight. The human body is composed of a variety of different tissue types including lean tissues (muscle, bone, and organs) that are metabolically active, and fat (adipose) tissue that is not. Assessing body composition in athletes is important for optimizing performance and evaluating the effectiveness of various training regimens.

The obtained results show that based on morphological dimension, mostly the body volume dimension and the under skin-fold match the different factors which are important for the maintenance and body stability. All processes that define the physical development are conditioned with mutual action of different endogenous and exogenous factors, (Kurelic, 1975).

Since deformation of legs X, medial epicondils of tibia and femur are voluminous and push the spinal inside and compensatory removal of legs, they enable normal movement and cause knee and muscle pain during long period standing on feet. This

obliges an individual to be adopted on these conditions, which are as a result of this deformity followed with decrease of activity, taking of many calories and insufficient consuming of them due to the lack of movements.

Physical activities, with dominated aerobe activity, keep their energetic balance in their body and herewith they prevent overweight (Hill and Wyatt 2005). However, life like that shows changes in the individual morphological characteristics.

Morphological development depends not only on internal and external biotic and social factors but also on legs deformation X, which indirectly have an impact on legs muscle stability decrease which play the key role in body activities.

4. CONCLUSION

Body Composition is a term used to describe the different components that together make up a person's body weight. "Lean" tissues, such as muscle, bone, and organs are metabolically active, while adipose (fat) tissue is not.

In this distinctive transversal research, differences between the two groups within the variable area have been analyzed in order to assess the body composition (lean body mass and body fat mass) with women with and without legs X deformities aged 18 and 19. Results show that deformations of legs X has a significant impact with women on their morphological development. This effect is manifested as a result of the reduction of leg muscle endurance, which plays the main role in physical activities.

Results of the research show that there have been changes in the structure of morphological characteristics among women in terms of under-skin fold and body volume increase and that there were no changes in body height. Women with legs X deformities should increase their kinesiology activities, along with specific exercises to increase their leg muscle strengthening. Despite this, overdose food calories should be taken into consideration.

5. LITERATURE:

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Influence of x-leg deformity in relation to fat and non-fat body composition in women was the goal of the paper. In this regards, the research included 41 female students with x-leg deformity and 41 female students without the deformity, while the total number of participants of the research was 82 aged from 18 to 19 years. 6 anthropometric variables have been used; one form measuring the body volme, three variables regarding the dimension of the sub skin fat tissue, one variable for measurement of non-fat body composition and one variable for measurement of fat body mass.

Anthropometric measurements were carried out according to International Biological Program (IBP).

Data collected demonstrates that x-leg deformity in women have significant influence on relation of fat and non-fat body composition. This relation is manifested as a result of decreased capacity of muscle endurance of leg muscles as main parts responsible for the physical activities, then consumption of calories and insufficient burning of fat as result of decreased capacity of movement.

Key words: *anthropometric variables, x-leg, female students, International Biological Program (MBP).*