

# DIFFERENTIATION OF BODY COMPOSITION IN STUDENTS OF THE UNIVERSITY OF VINCENT POL IN LUBLIN, POLAND

Grzegorz POPEK

*The University of Vincent Pol in Lublin, Poland*

## Key words:

- Body composition,
- university students

## Abstract:

Differentiation of body composition may be observed in each ontogenetic stage. The aim of this study is to compare body composition and daily metabolic demand in female students of Physical Education in the Department of Tourism and Physical Education. The research was conducted during the 2011/2012 summer in-course camp. The results are presented in tables and diagrams.

## INTRODUCTION

A common belief that human biological nature has remained unchanged for thousands of years is definitely true. It should be, however, remembered that the environment we live in has been going through a number of drastic changes, especially over the last decades. People tend to neglect the importance of physical activity, which results in hypokinesia since they undertake too little physical activity compared to their needs. This phenomenon is nowadays often described as suicide on an installment plan or “death spiral”. Human muscular system, which constitutes around 40-45% of adult body weight (about 1500 muscles), requires physical activity.<sup>1</sup>

One of today's most serious problems is obesity often resulting from the lack of activity. Obesity is considered to be a pathological state of excessive accumulation of body fat and concerns about 20-30% of adult population. According to Tatoń, a conventional boundary for obesity is when the body weight reaches the level of 120% of standard weight.<sup>2</sup>

There are cases where obesity does not have to result in overweight. Such cases include athletes involved in weightlifting, wrestling or bodybuilding. Their overweight cannot be considered obesity. Contrary situations should be taken into account as people with proper body weight may also be obese. Obesity is believed to be independent of body weight and is defined as a state when body fat constitutes more than 25% of body mass in men and more than 30% in women. Proper body fat percentage is 15-16% in men and 19-22% in women.<sup>3</sup>

Furthermore, it is believed that there are strong connections between the development of excessive metabolic syndrome and increased premature mortality.<sup>4</sup>

<sup>1</sup>. Starosta Wł., *Znaczenie aktywności ruchowej w zachowaniu i polepszeniu zdrowia człowieka*, wyd. Lider, 1997, nr 4, s.3

<sup>2</sup>. Tatoń J., *Związki między otyłością, a cukrzycą typu II*, Tygodnik Lekarski T.L. 1995 Supl. 1, s. 56-62

<sup>3</sup>. Szypuła Z, Pilch W. Borkowski Z. Ł. Bryła A., *Wpływ terapii dietetyczno ruchowej na skład ciała u średnio otyłych kobiet i mężczyzn {w}* Roczniki państwowego zakładu higieny tom 57 nr 3 2006, s. 283

<sup>4</sup>. Bonnefoy M, Jauffret M, Kostka T, Jusot JF: *Usefulness of calf circumference measurement In assessing the nutritional state of hospitalized elderly people*. Gerontology, 2002;48: s. 162-169

Human physique i.e. somatic composition is presently a popular subject of research and complex studies for many scientists.<sup>5</sup> Research is very often carried out on students who are the final element in education system. At the same time students constitute a significant group of selected individuals right before taking their future professional and social positions.<sup>6</sup>

The present academic paper investigates body composition in female students from the Department of Tourism and Physical Education at the University of Vincent Pol in Lublin, Poland and allows to answer the following questions:

1. What differences can be observed in body composition in female students from the Department of Tourism and Physical Education at the University of Vincent Pol in Lublin, Poland at the beginning and at the end of their summer in-course camp?
2. Does the character of the summer camp have impact on body composition in university students?

## RESEARCH MATERIAL AND METHODS

The research was conducted during the summer in-course camp in academic session 2011/2012 and involved 61 male and female students from the Department of Tourism and Physical Education. The research investigated the percentage of body composition (the measurements were taken with the use of „TANITA” Body Composition Analyzer SC 330): body fat percentage, total body water percentage, muscle tissue percentage, and basal metabolic rate in the female students.

## RESULTS ANALYSIS

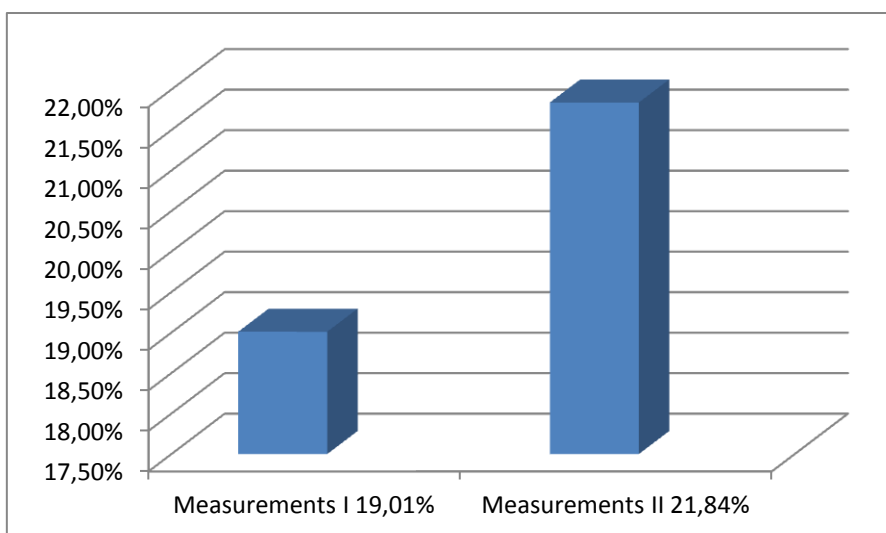
The results of 2 body fat percentage measurements in female students are presented in Table 1. The average of students' body defatting at the beginning of the camp reached the level of 19.01% which was over 2.83% less compared to the second measurement, however, the difference in the number of the measured students must be taken into account (I-16,II-13). As far as Table 1 is concerned, the minimum and maximum values are worth noticing as the minimum value increased by 0.7% during the second measurement, whereas the maximum value decreased by 2.4%.

**Table 1.** Comparative characteristics of body fat percentage in year I female students from the Department of Tourism and Physical Education

Measurements	Body fat percentage in female students						
	N	x	Sx	Me	Min	Max	Variance
First measurement – (at the beginning of the camp)	16	19,01%	6,28%	18,6%	13,3%	35,6%	39,47%
Second measurement – (at the end of the camp)	13	21,84%	5,78%	21,3%	14%	32%	33,46%

<sup>5</sup>. Szopa J., Mleczek M., Żak S., *Podstawy Antropomotoryki*, AWF Kraków 1996.

<sup>6</sup>. Zandecki A. *Struktura społeczna młodzieży akademickiej*. Poznań, UAM, 1989

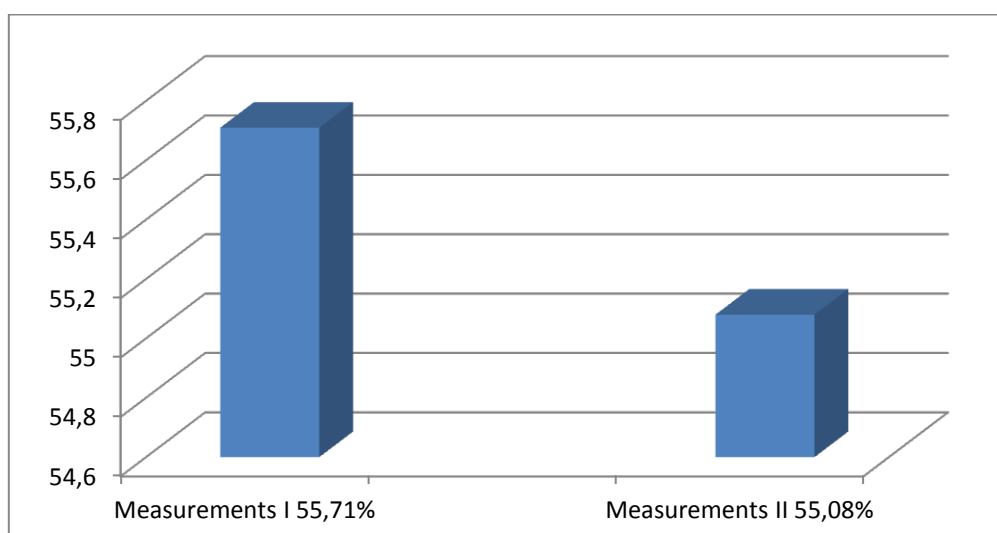


**Diagram1.** Comparative characteristics of body fat percentage in year I female students from the Department of Tourism and Physical Education

As far as total body water percentage is concerned, both measurements turned similar results. The smallest differences are observed in the results of maximum values of total body water percentage.

**Table 2.** Comparative characteristics of total body water percentage in year I female students from the Department of Tourism and Physical Education

Measurements	Total body water percentage in female students						
	N	x	Sx	Me	Min	Max	Variance
First measurement – (at the beginning of the camp)	16	55,71%	4,55%	55,85%	46,6%	62,2%	20,78%
Second measurement – (at the end of the camp)	13	55,08%	4,03%	55,2%	48,4%	61,7%	16,26%

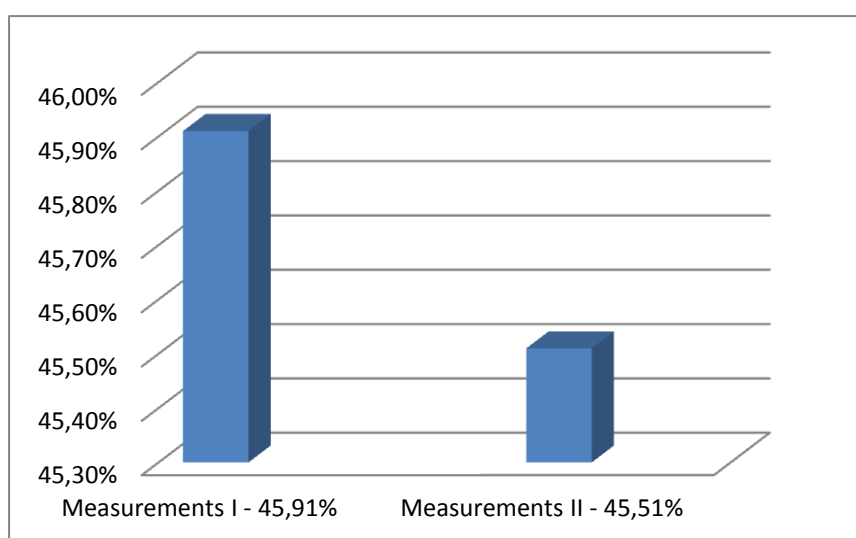


**Diagram 2.** Comparative characteristics of total body water percentage in year I female students from the Department of Tourism and Physical Education

The results of 2 body muscle tissue percentage measurements in female students are presented in Table 3. The obtained results show that arithmetic mean equals 45.91 % in the first measurement and 45.51 % in the second measurement. It is worth emphasising that the minimum value decreased by 0.7% whereas the maximum value increased by 2%.

**Table 3.** Comparative characteristics of muscle tissue percentage in year I female students from the Department of Tourism and Physical Education

Measurements	Muscle tissue percentage in female students						
	N	x	Sx	Me	Min	Max	Variance
First measurement – (at the beginning of the camp)	16	45,91%	5,25%	45,75%	39,6%	57,5%	27,62%
Second measurement – (at the end of the camp)	13	45,51%	5,32%	44,3%	38,9%	59,5%	28,30%

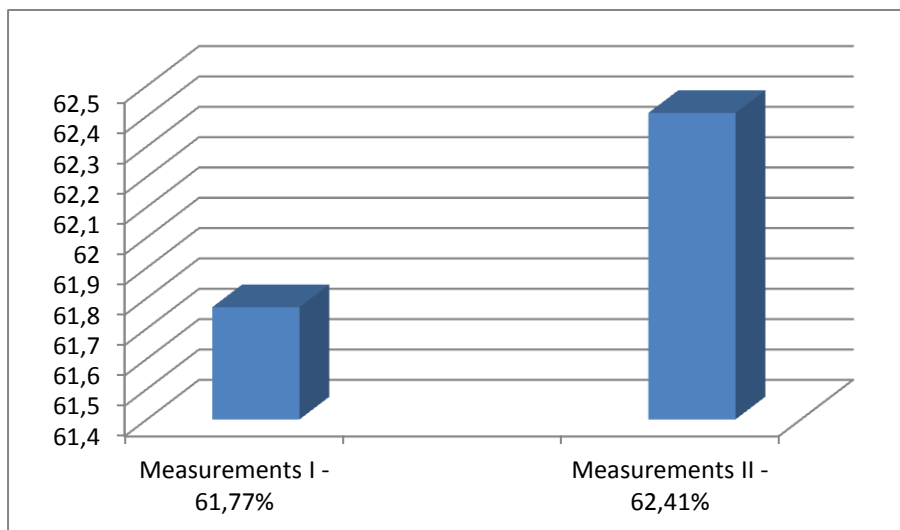


**Diagram 3.** Comparative characteristics of muscle tissue percentage in year I female students from the Department of Tourism and Physical Education

Table 4 presents the results of body mass measurements in female students. The obtained data show that both minimum and maximum values increased by 0.5kg.

**Table 4.** Comparative characteristics of body mass in year I female students from the Department of Tourism and Physical Education.

Measurements	Body mass characteristics						
	N	x	Sx	Me	Min	Max	Variance
First measurement – (at the beginning of the camp)	16	61,77	10,17	60,2	48,5kg	85,7kg	103,59
Second measurement – (at the end of the camp)	13	62,41	10,05	59,3	49kg	86,2kg	101,06

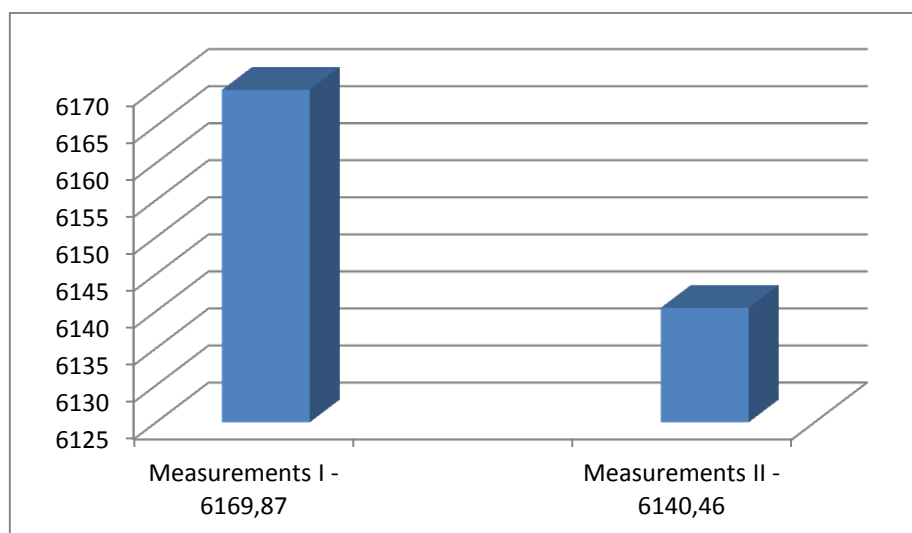


**Diagram 4.** Comparative characteristics of body mass in year I female students from the Department of Tourism and Physical Education

Basal metabolic rate measurements in female students turn similar results in both measurements. A noticeable increase in maximum value of basal metabolic rate can be observed.

**Table 5.** Comparative characteristics of basal metabolic rate in year I female students from the Department of Tourism and Physical Education.

Measurements	N	x	Sx	Me	Min	Max	Variance
First measurement – (at the beginning of the camp)	16	6169,87	668,35	6169,5	5314	7531	446695,31
Second measurement – (at the end of the camp)	13	6140,46	693,46	5979	5314	8004	480899,10



**Diagram 5.** Comparative characteristics of basal metabolic rate in year I female students from the Department of Tourism and Physical Education

Number of students according to age : I – under 25 years of age, II – over 25 years of age.

I	II
20 years – 7 persons.	27 years - 1 person.
21 years – 3 persons.	
22 years – 2 persons .	
23 years – 3persons .	

## RESULTS ANALYSIS AND FINDINGS

The analysis of the conducted research has enabled to answer the stated research questions. Students who decide to start a Physical Education course present, regardless of sex, better height and greater body mass compared to average population members. In majority of female Physical Education students greater than average body mass is caused by the prevailing amount of the fat-free tissue in their body composition, however in particular cases relatively high amounts of body fat tissue were also observed. The analysed university students proved to have similar body composition. The observed differences are too small to draw conclusions concerning significant differences in both measurements.

## WORKS CITED AND CONSULTED LIST

1. Bonnefoy M, Jauffret M, Kostka T, Jusot JF: Usefulness of calf circumference measurement In assessing the nutritional state of hospitalized elderly people. *Gerontology*, 2002;48: p. 162-169.
2. Starosta Wł. The importance of physical activity in maintaining and improving human health, ed. Leader, 1997, No. 4, p.3
3. Szopa J., Mleczko M., Żak S., Basics Anthropometrics, AWF Krakow 1996.
4. Szypuła Z., Pilch W.L., Borkowski Z.L., Bryła A. The influence of diet and physical therapy on body composition in obese average men and women {at} Annals of National Institute of Hygiene Volume 57 No. 3 2006 s 283.
5. Tatoń J. The relationship between obesity and type II diabetes. *T.L. Weekly Medicine*. 1995 Supl. 1, s. 56-62.
6. Zandecki A. Social Structure students. Poznań, Adam Mickiewicz University, 1989.