BODY WEIGHT AND BODY HEIGHT OF PRESCHOOL CHILDREN

(Preliminary communication)

Živorad Marković and Sandra Milanović

University of Kragujevac, Faculty of Pedagogical Sciences, Jagodina, Serbia

Abstract

Body weight and body height are measures of the international biological programme which are measure every three months during physical education of preschool children. The goal of this research was to determine eventual differences for two researched anthropometric characteristics of preschool children in relation to their age and sex. The research had transversal character and it was realized in kindergarten "Decija Radost" in Svilajnac, Republic of Serbia in October 2012 with the sample of 180 children. For the processing of the data the following methods were used: descriptive statistics and T-test for independent samples. Descriptive indicators indicate differences in favor of boys for both variables in all three age groups. There is statistically significant difference in body weight for older group and it is in favor of boys. For all "processes" the most decisive element is natural dynamics of growth and development.

Keywords: *physical education, anthropometric characteristics, t-test for independent samples,*

INTRODUCTION

Anthropometry (somatometry) is a method of measuring human body, i.e. certain body parts by which certain morphological characteristics of the body are determined and by which the objective image of the state of children's growth or constitutional type is acquired.

The results of anthropometric characteristics of pre school boys and girls have theoretical but even more practical significance. The significance is presented in organization of work with children in kindergartens and organized ways of directed activities. The basic problem in organization and work with children in kindergartens is in the question: is it necessary at that age to adapt and organize motor activities in relation to eventual differences between boys and girls or to apply it in the form which is relevant for all.

It is known that body height is mostly the best and the most stabile indicator of growth and development as a measure of skeleton bone tissue, which is taken as the best indicator of longitudinal dimension of a skeleton. Body weight is an indicator which represents a mixture of different tissues and it can vary during growth and development, so it is less reliable and useful measure in the evaluation of growth and development of preschool children. But with the combination of fat indicator in a body, which is evaluated by characteristic measures of subcutaneous fat tissue, than with bosy weight, aan im-

age of children's constitution can be acquired. It is necessary if we want to see motor behaviors of small children, because we can expect positive relation between harmonic biological growth and development and motor functioning of children.

Factor structure of anthropometric variables is not the same for all members of human race, but depends on age, sex, genetic and ecosocial components.

Momirović, Medved, Horvat, & Pavšić-Medved, (1969), recognized four anthropometric factors indicated as latent morphological dimensions: longitudinal skeleton dimension, transversal skeleton dimension; mass and volume of the body and subcutaneous fat tissue.

All isolated latent anthropometric dimensions are interrelated. The relation is greater in women than in men.

Measuring of anthropometric characteristics in pre schools is realized every three months and it consists of height measure and body mass measure. Having anthropometric characteristics is veru important for planning of activities, coice of methods and organizational ways of work and in the choice of physical exercises.

On the basis of this the goal of this research was to determine eventual differences in height and body mass of preschool children in relation to their age and sex.

METHODS

The research was realized in preschool "Decja Radost" in Svilajnac, Republic of Serbia in October 2012. The research included 180 children divided into 6 sub samples – according to the criteria of sex and age: 28 boys of younger age group, 32 girls of younger age group, 35 boys of medium age group, 25 girls of medium age group, 31 boys of older age group and 29 girls of older age group.

Two anthropometric characteristics were applied in the research: body weight and body height. Anthropometric characteristics were measured by the method of International biological programme. Apart from descriptive statistics for the processing of the data t-test was also applied for independent samples.

RESULTS

On the basis of the results in Table 1 it can be said that the values do not differ from the results for the certain age (Bala, 2004; Marković, 2008; Marković and Sekeljić, 2008). The average body mass of boys is 147.71 dk, and fro the girls 148.56 dk. The average body height for boys is 953.75 mm, and for girls 961.40 mm.

The boys and girls have similar body weight, and

Table 1. Descriptive indicators of anthropometric characteristics of boys and girls in younger age group

Variables	N	Mean	Sd
Body weight - 1	28	148.71	29.52
Body height - 1	28	953.75	49.56
Body weight - 2	32	148.56	19.82
Bodu height - 2	32	961.40	47.13

girls are for 6 mm on average taller than boys at this age.

Standard deviation with the value of 29.52 for boys and 19.82 for girls indicates heterogeneity of the results for body weight.

By looking at the Table 2. it can be stated that there

Table 2. The significance of differences of anthropometric characteristics for boy s and girls in younger age group

Variables	df	t-test	p
Body weight	58	.024	.981
Body height	58	.613	.542

is no statistically significant difference between boys and girls for the researched variables. The level of statistical significance for body weight is p=.981, and for body height p=.542.

On the basis of the results in Table 3. it can be stated that the average body weight of boys is 172.71 dk and for girls 177.76 dk. The average body height of boys is

Table 3. descriptive indicators of anthropometric characteristics of boys and girls of medium age group

Variables	N	M	Sd
Body weight - 1	35	172.71	19.05
Body height - 1	35	1055.14	60.94
Body weight - 2	25	177.76	18.28
Body height - 2	25	1049.20	45.88

1055.14 mm, and for girls 1049.20 mm.

What we can see is that girls have on average bigger body weight than boys for 0.5kg, and that boys are taller on average for 6mm.

Standard deviation with the value 60.94 for boys and 45.88 for girls indicates heterogeneity of the results for body height.

By the insight in the Table 4 we can say that there

Table 4. Significance of differences of anthropometric characteristics of boys and girls in medium age group

Variables	df	t-test	p
Body weight	58	1.028	.308
Body height	58	1.070	.683

is o statistically significant difference between boys and girls in the researched variables. The level of statistical significance for body weight is p=.308 and for body height p=.683.

The average body weight of boys is 231.03 dk, and

Table 5. Descriptive indicators of anthropometric characteristics of boys and girls in medium age group

Variable	N	M	Sd
Body weight – 1	31	231.03	52.95
Body height - 1	31	1147.09	83.11
Body weight - 2	29	202.79	30.41
Body height - 2	29	1127.93	75.07

girls 202.79 dk. The average body height of boys' is 1147.09 mm, and girls 1127.93 mm. The thing that can be seen is that the boys have bigger body weight in relation to girls on average for 28.23 dk and body height on average for 19.16 mm.

Standard deviation with the value of 52.91 for boys and 30.41 for girls indicates heterogeneity of the results for body height.

By the insight in Table 6. it can be said that there is no statistically significant difference between boys and girls in body weight, with the level of statistical signifi-

*Table 6. Significance of differences of
anthropometric characteristics for
boys and girls in oldeage group*

Variables	df	t-test	p
Body weight	58	2.509	.015
Body height	58	.935	.354

cance p=.015. There is no statistically significant difference in body height, because the level of statistical significance is p=.354.

CONCLUSION

On the basis of the results it can be stated that there is statistically significant difference only for body weight for older age group and it is in favour of boys.

The differences are the result of coincidences and constitutional differences which are provoked by different influences of social factors.

REFERENCES

Bala, G. (2004). Kvantitativne razlike osnovnih antropometrijskih karakteristika i motorićkih sposobnosti dečaka i devojčica u prdškolskom uzrastu. [Quantitative differences of basic anthropometric characteristics and motor abilities of boys and girls in preschool age. In Derbian.] *Glasnik antropološkog društva Jugoslavije,* 39, 219-227.

Kahrović, I., Murić,B., & Bogdanović, Z. (2011). Effects of physical activities on adult's obesity. *Activities in Physical Education and Sport, 1* (1), 29-33.

Kurelić, N., Momirović, K., Stojanović, M., Šturm, J., Radojević, Đ., & Viskić-Štalec, N.. (1975). *Struktura i razvoj morfoloških i motoričkih dimenzija omladine.* Structure and development of morphological and motor dimensions of youth. In Serbian.] Beograd: Institut za naučna istraživanja Fakulteta za fizičko vaspitanje Univerziteta u Beogradu.

Marković, Ž. (2008). Uticaj celodnevnog i poludnevnog boravka na antropometrijske karakteristike i motoričke sposobnosti predškolskog uzrasta. [The influence of a whole day stay and a half day stay on anthropometric characteristics and motor abilities of preschool children. In Serbian.] *Uzdanica*, (1), 104–117, Jagodina: Pedagoški fakultet u Jagodini.

Marković, Ž., & Sekeljić, G. (2008). Uticaj boravka u predškolskim ustanovama na fizički razvoj i fizičke sposobnosti. [The influence of stay in preschools on physical development and physical abilities. In Serbian.] *Compilation of works*, (9), 79–94. Užice: Učiteljski fakultet u Užicu.

Marković, Ž., Bpgdanović, Z., Ignjatović, A., & Milanović, S. (2011). Effects of two models of planning of teaching physical education on anthropometrical characteristics of secondary school female students. *Activities in Physical Education and Sport, 1* (2), *1451-149.*

Momirović, K., Medved, R., Horvat, V., & Pavšić-Medved, R. (1969). Notmativi kompleta antropometrijskih varijabli školske omladine oba spola u dobi od 12-18 godina. [Norms of a compilation of anthropometric variables of school youth of both sexes between the age 12 to 18. In Serbian.] *Fizička kultura, 23*(9–10), 263-278.

Ugarković, D. (2004*). Biomedicinske osnove sportske medicine*. [Biomedical bases of sport medicine. In Serbian.] Novi Sad: FB PRINT.

Correspondence:
Živorad Marković
University of Kragujevac
Faculty of Pedagogical Sciences
Milana Mijalkovića 14, 35000 Jagodina, Serbia
Republic of Serbia
E-mail zimarkovic@yahoo.com