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Arben Osmani, University Educational Institution AAB (Prishtina, Kosovo)

*Mamaj Driton, Kosovo Education Center – Shkolla Milleniumi i Tretë
(Prishtina, Kosovo)*

DIFFERENCES IN THE MOTORIC ABILITIES OF STUDENTS DUE TO THE BODY MASS INDEX (BMI)

Introduction

In kinesiology we can find many articles that discuss the motoric abilities as a major subject of their research.

According to the goal set, namely concerning the motoric abilities or the relations between them, there are completed researches that have determined the following: differences, comparisons, relations, changes, effects, structure, and measure characteristics (established through motoric ability tests).

On the basis of the latest data of Matthiesen & al. (2008), there is an increase of the number of fat children at the adolescent or pre-adolescent age.

According to Biro & Wien (2010) children have a tendency or predisposition to remain in that category as adults as well.

According to Wrotniak & al. (2006) overweight and fat children have weaker motoric abilities.

The research has been conducted in order to establish differences in the motoric abilities determined by the body mass index (BMI) with students tested at the eighth grade of primary education (Barlow, & the Expert Committee, 2007).

Methods

During this research we have tested 160 male students aged 14. On the basis of (BMI) they were divided into 3 groups (normal, overweight, and with obesity). They were tested with 6 motoric tests for following: explosive power - standing a long jump (SLJ); repetitive power - a deep bend on the bench (DBB); coordination – running in eight (RE8); equilibrium – balancing with eyes open (BEO); precision– target shooting with a short stick (STS); and flexibility – inclination forward on the bench (IFV).

Along with basic statistic parameters, the differences between the groups were established through analysis of variance (ANOVA), multivariate analysis of variance (MANOVA) and least significance test (LSD-tests).

Results

The obtained results are presented in following tables.

Results of the basic statistic parameters for each group (table 1, 2 and 3) of the respondents are relatively homogeneous. No discrepancies are noticed with relation to asymmetry and grouping of the results.

On the base of the results in tables 4 and 5 (ANOVA and MANOVA), a statistically significant difference in favor of the group of normal body mass index is recorded

in the following tests: standing a long jump, running in eight and balanced in eyes open. This suggests that the groups of normal weight maintain the characteristics of better explosive power, coordination and balance (equilibrium).

Table 1. Descriptive Statistics - students with normal BMI (N=60)

	Mean	Minimum	Maximum	Std.Dev.	Skewness	Kurtosis
1. SLJ	1,56	1,05	2,20	0,20	-0,49	1,32
2. DBB	19,07	1,00	79,00	13,95	0,58	3,48
3. RE8	20,40	17,34	27,01	2,26	0,82	0,09
4. BEO	5,73	1,10	20,00	3,74	1,12	2,95
5. STS	56,33	32,00	68,00	7,05	-1,05	1,63
6. IFV	43,04	26,00	55,00	7,39	-0,38	0,10

1. SLJ – standing a long jump; 2. DBB – a deep bend on the bench; 3. RE8 – running in eight; 4. BEO – balancing with eyes open; 5. STS – target shooting with a short stick; and 6. IFV – inclination forward on the bench.

Table 2. Descriptive Statistics - students with overweight BMI (N=50)

	Mean	Minimum	Maximum	Std.Dev.	Skewness	Kurtosis
1. SLJ	1,48	0,80	1,85	0,23	0,20	0,12
2. DBB	18,88	0,00	69,00	14,59	1,27	2,36
3. RE8	21,55	16,29	24,75	1,94	-0,22	-0,20
4. BEO	4,81	1,10	18,30	4,34	1,68	1,97
5. STS	57,04	32,00	66,00	6,39	-1,77	4,54
6. IFV	35,62	18,00	51,00	11,02	0,92	0,55

Table 3. Descriptive Statistics – obesity students (N=50)

	Mean	Minimum	Maximum	Std.Dev.	Skewness	Kurtosis
1. SLJ	1,46	0,80	1,85	0,20	-0,46	0,83
2. DBB	14,82	0,00	63,00	14,43	1,58	2,40
3. RE8	22,65	16,00	29,92	3,00	0,72	0,30
4. BEO	4,38	1,00	34,10	5,01	0,63	2,94
5. STS	55,08	24,00	67,00	8,62	-1,65	3,51
6. IFV	46,58	16,00	35,00	15,40	0,56	2,99

Table 4. Multivariate analysis of variance (MANOVA) between three groups of students (normal, overweight and with obesity)

	Wilks'Lambda	Rao's R	df 1	df 2	p-level
1	0,68	5,44	12	304	0,00

Table 5. Analysis of variance (ANOVA) between three groups of students (normal, overweight and with obesity)

	Mean sqr Effect	Mean sqr Error	F	p-level
1. SLJ	0,15	0,04	3,48	0,03
2. DBB	298,18	204,54	1,46	0,24
3. RE8	81,43	5,90	13,81	0,00
4. BEO	1741,35	132,54	13,14	0,00
5. STS	49,42	54,59	0,91	0,41
6. IFV	2,68	18,99	0,14	0,87

Discussion

The results obtained in this research indicate that obesity and overweight cause negative effects and results in lower performances concerning some motoric abilities.

On the basis of the obtained results, it can be concluded that the group of students with the normal body mass index achieved the best results in the motoric abilities when assessing the following: explosive power, coordination, and equilibrium. As for the motoric abilities concerning precision, repetitive power, and flexibility, there have not been established statistically significant differences between the three groups.

The obtained results correspond with some of the earlier researches (Milanese, et al., 2010; Zhu, Sheng, Wu, & Cairney, 2010), while with some other disagree (De Toia, et al., 2009).

References

Barlow, S.E., & the Expert Committee (2007). Expert committee recommendations regarding the prevention, assessment, and treatment of child and adolescent overweight and obesity: summary report. *Pediatrics*, 120, 164–192.

Biro, F.M., & Wien, M. (2010). Childhood obesity and adult morbidities. *American Journal of Clinical Nutrition*, 91(5), 1499–1505.

De Toia, D., Klein, D., Weber, S., Wessely, N., Koch, B., Tokarski, W., Dordel, S., Strüder, H., & Graf, C. (2009). Relationship between Anthropometry and Motor Abilities at Pre-School Age. *Obesity Facts – The European Journal of Obesity*, 2(4), 221–225.

Zhu, Y.C., Sheng, K., Wu, S.K., & Cairney, J. (2011). Obesity and motor coordination ability in Taiwanese children with and without developmental coordination disorder. *Research in Developmental Disabilities*, 32(2), 801–807.

Milanese, C., Bortolami, O., Bertucco, M., Verlato, G., & Zancanaro, C. (2010). Anthropometry and motor fitness in children aged 6-12 years. *Journal of Human Sport & Exercise*, 5(2), 265–279.

Wrotniak, B., Epstein, L.H., Dorn, J.M., Jones, K.E., & Kondilis, V. (2006). The Relationship Between Motor Proficiency and Physical Activity in Children. *Pediatrics*, 118(6), 1758–1765.

Matthiesen, J., Velsing, G.M., Fagt, S., Biloft-Jensen, A., Stockmarr, A., Andersen, J.S., & Trolle E. (2008). Prevalence and trends in overweight and obesity among children and adolescent in Denmark. *Scandinavian Journal of Public Health*; 36(2), 153-160.

DIFFERENCES IN MOTOR ABILITIES OF STUDENTS DUE TO THE BODY MASS INDEX (BMI)

Introduction: The research has been conducted in order to establish differences in motoric abilities due to the body mass index (BMI) with the tested students at the eighth grade (Barlow, & the Expert Committee, 2007). *Methods:* During the research 160 male students aged 14 were tested. On the base of (BMI) they were divided into 3 groups (normal, overweight, and with obesity). They were tested with 6 motor tests for: explosive power, repetitive power, coordination, equilibrium, precision, and flexibility. Along with basic statistic parameters, the differences between the groups are established through: ANOVA, MANOVA and LSD-tests. *Results:* The obtained results are presented in 5 tables. On the base of the results, a statistically significant difference in favor of the group of normal body mass index is recorded in the following tests: standing a long jump, agility on the ground and keeping balance on one leg. *Discussion:* The results obtained in this research indicate that obesity and overweight cause a negative effect and result in lower performances concerning some motoric abilities. On the base of the obtained results, it is concluded that the group of students of normal body mass index achieved the best results in the motoric abilities with assessing the following: explosive power, coordination, and equilibrium. As for the motoric ability concerning: precision, repetitive power, and flexibility, there are no established statistically significant differences between the three groups. The obtained results correspond with some former researches (Milanese, et al., 2010; Zhu, Sheng, Wu, & Cairney, 2010), and some do not (De Toia, et al., 2009). *References:* Barlow SE et al. (2007). *Pediatrics*, 120, 164–92. De Toia D, Klein D, Weber S, Wessely N, Koch B, Tokarski W, Dordel S, Strüder H, Graf C (2009). *European Journal of Obesity*, 2(4), 221–5. Zhu YC, Sheng K, Wu SK, Cairney J (2011). *Research in Developmental Disabilities*, 32(2), 801–7. Milanese C, Bortolami O, Bertuccio M, Verlato G, Zancanaro C (2010) *Journal of Human Sport & Exercise*, 5(2), 265–79.