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RELATION OF BODY MASS INDEX (BMI) TO STUDENTS' ACHIEVEMENTS AND PERFORMANCE REGARDING THEIR MOTOR ABILITIES

INTRODUCTION

When we talk about children ,who are 14-15 years of age ,we can freely say that this is one of the most sensitive and the most intense periods of their growth and development. Time and period where the physical activity and the proper / improper diet can have a significant impact on the proper building of the individual, but also a period in which , not doing enough care can easily lead to the emergence of various irregularities, so often and bodily deformities.

The improper nutrient consumption is one of the most acceptable habits in children at this period. Childhood which is characterized by different habits with the most sensitive influence on the development of the individual. The proper nutrient consumption represents a certain parameter of weight maintenance, which in turn reduces the risk of acute and chronic diseases related to obesity and malnutrition. The continuous physical activity through the established curricula have goals to meet the necessary requirements necessary to provide proper growth and development of students. Acquired motor habits and sport technical knowledge, which students receive by curricular and extra curricula contents and activities precondition and have a significant impact on the individual's biomotor abilities and the morphological characteristics.

A subject of our research were the eighth grade students from the R. Macedonia, R. Albania, and R. Serbia, who regularly attended classes in the academic year 2011. Our goal was to establish the kind of connection that was present between the obtained index of subcutaneous fat with the achievements' assessing and the performance of motor skills among students.

THE SAMPLE OF SUBJECTS AND METHODS OF WORK

The survey was conducted at the total number of 192 male respondents of age 14-15 years (±3 months) in three Balkan countries (R . Macedonia, R. Albania and R. Serbia). Firstly was executed a determination among respondents according to the index of subcutaneous fat tissue, where were defined three subsamples of respondents. The first subsample consisted of 119 students with normal nutrition, the second subsample consisted of 57 students who by their gained index were determined as slim and the third subsample consisted of 16 students who by their gained index were determined as obese.

Variables for assessing the achievements and performance:

♣ **The grade from the school's registry** (in the account was taken, the determined semi-annual grade as a result of the extracted grades during the teaching in the first semester.

♣ **Assessment of the performance of motor skills and habits** (the assessment was made on the technique and habits of gaining elements of certain sports' disciplines which in accordance with the curriculum of the three countries were examined during the school's year):

- Basketball - running the ball and entry towards the basket using two-step;
- Handball - running the ball and a goal shot from a jump shot;
- Athletics - high and low start
- Gymnastics - a handstand and a forward roll).

♣ **Assessment of the motor skill's performance** (the evaluation was performed on thirteen motor tests):

- Assessment of the legs' explosive power - long jump forward from a place and a triple jump;
- Assessment of the sprinter's speed - running 20 meters from a high start and running 50 meters from a high start;
- Assessment of the repetitive power - push-ups and raising the trunk from the ground;
- Assessment of the body's absolute power – dynamometric of the stronger arm and upwards knuckle;
- Assessment of the accuracy - darts and shooting horizontal goal with the ball;
- Assessment of flexibility - deep bent on the bench;
- Assessment of the body's balance- balance using one leg with closed eyes and
- Assessment of the hands' frequency speed and the shoulder's belt - hand taping.

In the tests' evaluation was used a five degrees numerical scale. At all variables, and at the end from all gained grades was extracted one summative grade.

Data from all variables was processed by the basic descriptive statistical parameters. The determination of the association between the criteria, BMI - index (coefficient of subcutaneous

fat) with the achievements of the students were determined by regression analysis.

RESULTS AND DISCUSSION

In table no. 1 and 2 are shown the basic descriptive parameters of the morphological characteristics and scores from the performed test (a grade from the school's registry, estimation of the performance of motor skills and habits and assessment from the performance of the motor abilities) at the three groups of subjects. Defined were the number of respondents (Valid N), arithmetic means (Mean), minimum and maximum score (Minimum, Maximum), distance (Rang), variance (Variance), standard deviation (Std. Dev), Skewness (Skewness) Kurtosis (Kurtosis).

Values of the Skewness according to the indicators obtained from the morphological measures are considered moderately asymmetric. There is a noticeable deviation from normal at the variable BMI - index sample at the subsample of slim students of -1,14 (Skewness = -1.142).

The obtained values of Kurtosis from the morphological indicators are below the limit of 3.00, therefore according to these results are considered platikurtichni.

The distribution of the obtained values of Skewness in the assessment indicate on a moderate asymmetry with the exception of variables: grade from the school's registry of 1.11 and grade from the motor skills and habits of 1.19 at the normally nourished students, (Skewness = -1,114 and Skewness = -1,193) and variables: a grade from the school's registry of 1.13 and assessment of motor skills and habits of 1.37 at the malnourished students, (Skewness = -1,134 and Skewness = -1,367).

The obtained values of Kurtosis' evaluation indicators are below the limit 3.00, therefore according to these results are considered platikurtichni. Exception makes the indicator for the assessment of motor skills at the subsample of slim students that got values of 4.27 (Kurtosis = 4.270), directing on leptokurtichnost.

Looking at the indicators from the executed assessment of achievements among students can be noted that the best results in all three variables reached students who according to this definition were classified with normal nutrition. Worst scores compared with the other two determined groups of the three variables were noticed at students who according to the performed determination were classified as obese students.

Worst scores among all three groups of subjects were observed in the variable for assessment of motor skills.

After processing the data with basic statistical parameters and determining the differences, was performed a regression analysis in the manifest space, in which as the criterion was taken the test for assessing subcutaneous fat (BMI - index) at all three subsamples and as predictors were taken the results of the conducted assessment of achievements in the executed performance at variables: a grade from the school's registry ,a grade of motor knowledge and habits and a grade of motor skills.

From the inspection of table 3, can be seen that the coefficient of multiple correlation, i.e. the correlation of the system of obtained grades with the criterion, the index of subcutaneous fat (BMI - index) in the determined sample of students with normal nutrition is R = .31, and the coefficient of prediction is R^2= .09, meaning it explains the common variability of about 09%. This association was significant at the level of p= 007. The remaining 91% of in the explanation of the total variability remains on some other features and capabilities of the respondents who were not a subject of this research (e.g. other morphological measures, motor variables, conative, cognitive, motivational, functional, etc.). Although the whole system of morphological variables noted statistically significant association of low level with the criteria, a single negative statistically significant association of very low level was observed only at the variable grade from the motor skills (BETA = 0,184), which is significant at the level of p-level = .047.

From the inspection of table. 4 and 5, can be seen that the criteria, index of subcutaneous fat (BMI - index) among groups of students who according to the performed determination were classified in the group slim and obese, with the predictor (a grade from the school's registry ,a grade of motor knowledge and habits and a grade of motor skills) are not observed statistically significant associations.

CONCLUSION

♣ Statistically significant impact of low level, was noted on the system of applied variables for assessing the achievements of the students on the criteria - subcutaneous fat (BMI - index) only at the group of normally nourished students, according to the completed determination that is not the case in the other two groups .

♣ From the executed assessment of the derived variables ,best results achieved students who according to the performed determination were classified as normally nourished students, while the worst scores were recorded in the group of obese students.

♣The worst results at all three determined groups of subjects were noted at the variable for assessment of motor skills.

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RELATION OF BODY MASS INDEX (BMI) TO STUDENTS' ACHIEVEMENTS AND PERFORMANCE REGARDING THEIR MOTOR ABILITIES

The research has been conducted on 192 school boys, aged 15 ($\pm$3 months). All of them were regular attenders in the class of Physical Education and Sport at primary school. According to BMI (the coefficient of fat), there were determined three subsamples of entities. The aim of the regressive analysis is to establish how the obtained index of fat is related to the students' achievements and demonstration of their motor abilities.

Key words: *class, Physical Education, success, 15-year old school boys*