

The relationship between indicators of physical growth and motor and intellectual abilities with seven- year- old children

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Abstract: In this research we investigated and evaluated the anthropometric and the anthropomotor status complexity of the children of the first grade of the first grade of primary school. The relationships between anthropometric dimension indicators and anthropometric abilities of children were estimated, on the one hand, and indicators of Type 1 test, as the test of composite type of general abilities tests, on the other hand. Indicators of children's physical growth, including the anthropometric dimensions and anthropomotor functions were in most of the cases linked with the indicators 135 determined by the standard method for investigation of general nature, actually readiness of children for school enrolling. This result suggests that physical growth is a component of the general growth that should not be neglected during this evaluation of the maturity level for seven- year-old children.

Keywords: physical readiness, anthropometric dimensions, anthropomotor functions.

Research

The object of the research

The object of the research was the relations between the physical growth indicators and the motoric abilities and the intellectual abilities indicators at the seven years old children .The relation between the anthropometric dimension indicators on one side and the standard

method for investigation of general maturity, actually readiness of children for the school enrolling.

The aim, tasks, and hypotheses of the research

The aim of the research was to collect the scientific data based on which one could answer the following questions:

- Was there a connection, and what was it like, between the anthropometric dimension indicators and anthropomotoric abilities and the general method of investigating the general maturity indicators, apropos the actual readiness of children for the school enrolling.

By making the aim of the research clear and operative, one could come to conclusion of the following investigational tasks:

1. Collecting the data by measuring

- the anthropometric dimension indicators of the morphological growth: height, weight, the body components (bone, muscle and fat tissue);

- anthropomotoric abilities indicator of the speed, strength of the arms and legs as well as the total body strength

2. Collecting the results of the standard method for investigating of general maturity, actually readiness of children for the school enrolling.

3. Getting the collected data into mutual relation.

The study of the growth and motoric abilities indicators should able:

- seeing the condition of the basic physical growth and development of the physical abilities indicator

- seeing the level of the connection between the investigated parameters and the intellectual abilities indicators

- comparing the shown results with the other investigators that investigated the prior phenomena as the part of the other tasks and on the other types of the population

Hypotheses

Based on the defined object of this work, considering the need and the importance of the research, the following hypotheses came out:

1. There is a consumption that there was a connection between the anthropometric dimension indicators on one side, and on the other, the indicators that came out of the standard method for investigation of general maturity, actually readiness of children for the school enrolling,

2. There is a consumption that there was a connection between the anthropomotoric abilities indicators on one side, and on the other,

the indicators that came out of the standard method for investigation of general maturity, actually readiness of children for the school enrolling.

Methods, techniques and the instruments of the research

We used the descriptive method of the research was to describe the actual appearances, interpretation of the shown results, and the conclusions, too. We used the statistic procedure for finding out the actual size of the particular appearances and the investigated relation.

The used, kinetic investigating techniques:

- the technical evaluation of the morphological status – anthropometric measurement of the morphological dimensions
- the techniques for the anthropomotoric status evaluation – motoric tests
- studying the pedagogically –psychological documentation

The examinee sample

The samples for this research were the seven years old children, four preschool groups from two different kindergartens. Considering the average presence of the children, the sample was 141 children.

The variables sample for the evaluation of the morphological development

This research considered directly measured and secondary anthropometric parameters.

There were 16 directly measured: TV- height; TM-weight; DiLa-elbow diameter; DiRu-hand wrist diameter; DiKo-knee diameter; DiSt- ankle diameter; ONI-upper arm circumference; OPI-forearm circumference; ONk-upper leg circumference ;DKNBi- skin wrinkle biceps; DKNPI-skin wrinkle forearm; DKNNk-skin wrinkle upper leg; DKNPk-skin wrinkle under leg; DKNT-skin wrinkle stomach.

There were five secondary anthropometric parameters as the components of the body structure (0- absolute mass of the bone tissue and %0-relative mass of the bone tissue; D-absolute mass of the fat tissue and %D-relative mass the fat tissue; M-absolute muscle mass and %M-relative muscle mass; LMB- relative value of the nonfat component, R-dry remainder (the component of the body structure that includes the organs, brains, fluid...))

Measurement

The battery of the tests, for the age of the children between five and seven, used for the estimation of the development level of the motoric tasks based on which one could estimate; explosive strength of the leg muscle; the strength of the arms and the endurance; the general strength; general speed ability. In all five tests, the motoric tasks are complexed and include tests of psychophysical characteristics that develop the most during the preschool period.

Data processing

The research data were preceded by the computer. The complete statistic data processing were done on PC computer with the statistic program SPSS.

Results and discussion

The goal of all investigated variables was the each variable calculation of the primary characteristics of frequency distribution: average measurement (arithmetic mean-M), variability measurements (standard deviation- δ), measurements for the deviation of empiric distribution from the normal (skjunis-SK, kurtosis-KU). As well as that, there was a minimum and maximum result in each variable.

Based on the results, received and interpreted, one could conclude that from the total body weight of the children age 6; 3; 6. to 7; 4; and 3 on certain tissues and organ systems their representation of certain components of the body structure in percentage.

The estimation of the developmental level of the morphological status of the children, showed that the average values of the investigated parameters were around the expected level, which represented the fact that the average values did not deviate much from the recent similar research results in our and foreign literature.

The average values of the investigated morphological status dimensions gave the important information about the morphological status of the seven years old children.

Research determined the average values of mentioned age children, so the author of this particular research, for the first time (there is no similar research in any kind of literature), gave the data of the body structure value (children age 6 to 7).

So, the children that were from the town had the average: height 124,07 cm; weight 23,55 kg; bone tissue 4951,51 g or 21,16%; muscle tissue 9555,6 g or 40,61% and 4129,67g fat tissue or 16,98% .

Based on the given average values, we can conclude that the investigated morphological characteristics, at the examined sample, are very much average and above average, that the children are morphologically mature, with the observation that 9,9 – 15,6% of the children, are under the average, and 14,9% have the increased fat tissue values, which can be negative for their growth and development and certainly can influence on their success in upper classes at the school.

As the indicator of the general maturity and readiness of children for the school enrolling, the test Tip 1, as the test of the general abilities of the composite type.

Tip 1. is a test of the general intellectual ability used for founding out the readiness of children for school enrolling and prediction of their school success in lower classes at the primary school. This test had five types of the tasks:

I – Knowledge, II- Memory, III-Perceptive conclusion, IV- Verbal abilities and V-Logical operations

Considering the goal of the test was used in analysis.

One could see 141 children were doing the test Tip1. The results went from 19 to 55 points, arithmetic mean 37, 51 point, standard deviation 8, 51 points and all that corresponded the results of the sample on which the test had been standardized.

The relations between the physical growth and the motoric abilities indicators, and the intellectual abilities indicators of the seven years old children.

Based on already mentioned research, we searched for the answers to the following questions: How can you see the connection between the anthropometric dimension indicators and the anthropomotoric abilities (as the physical maturity indicators) and the general maturity of the children, test Tip 1; is it enough just to investigate only one maturity and readiness, and based on a result how can one predict anything.....?

The results showed that there was a connection between the motoric indicators and test Tip1. results.

Body weight ($p=0,20 \pi 0,05$), bone tissue ($p=0,21 \pi 0,005$), as the indicators of the morphological maturity of the children, statistically connected with the results at the test Tip 1 as the general abilities of the composite type indicators. Correlations are positive, low but statistically significant. The results are equal to the results V.Grahovac (1998.) ,that showed the connection between the Filipino test of the children research results and the first grade children (Tip 1 test $p=0,25 \pi 0,01$).

The results showed that there was a connection between the motoric indicators and the results of the children on the test Tip 1. The tasks for the evaluation of the legs ($p=0,17 \pi 0,05$), general strength ($p=0,16 \pi 0,05$) flexibility evaluation ($p=0,24 \pi 0,01$) had the significant statistically connection with the results of the children at the test Tip 1. Correlations are low, positive, but statistically significant.

Based on the analysis of the connection of all the investigated parameters of each and every component of the children physical growth with the results of the general abilities composite type (Tip 1) test, one could conclude that the hypothesis were confirmed. The anthropometric dimensions and the anthropomotoric abilities of the children are very much connected with the results of the children at the test Tip 1. That means that, without the physical indicators of the maturity and readiness, one cannot have the whole picture of the general maturity of the seven years old children.

Considering the contribution of the physical education in certain aspects of the development, as well as in the personality development, it seems that the acceptable proposition of F. Williams (one should rather talk about the "education through physical education" than about the "physical education"), starting from the term of the organ unity between the spirit and the body, mutual dependence of the organism and the environment, and the contribution of the physical activities to the social, emotional and physiological development (Williams, Kamenov 1999, 2009).

Conclusion

The results, their analyses and discussion, show the significant conclusions based on which one can estimate and justify the given hypotheses.

The estimated data that came from the anthropometric dimensions of the seven years old children, showed similar to the prior research on the samples from the foreign and our children, speaking of the weight and height indicators. The components of the body structure: bone, muscle and fat tissue (investigated for the first time with the 6-7 years old children) and the values, complete the estimation of the morphological status of the investigated children.

Speaking of the motoric abilities estimation, it was concluded that the strength of the arms, with the investigated children, was week. That

showed the factor of insufficient maturity of this function, but the insufficient activities that could improve the development. On the other hand, the characteristic data was the one that the strength of the legs had been developed, which could be presented as the maturity of the function and the better opportunity for its improvement by the spontaneous and organized exercise.

The research of the general strength and speed gave the average results, and the flexibility, actually plasticity of the children development had been well developed.

Finally, by the statistical methods, there was a connection between the physical growth indicators and the results of the test Tip 1, which is the standard procedure for examining the general maturity, actual readiness for the school enrolling. Speaking of the anthropometric parameters, beside the height, the positive but low connection of the rest parameters (weight, bone, fat and muscle tissue) to the success at the test Tip 1. There was a low, positive and statistically significant connection between the motoric abilities indicators and Tip 1 test results, when the tasks for the estimation of the legs` strength, general strength and the flexibility were done.

The children physical development indicators (anthropometric dimensions and anthropomotoric abilities, in many cases, most of the components are connected with the standard procedure for estimating the general maturity indicators, actually readiness of the children for the school enrolling. This implicates that the physical development components that should not be neglected during the estimation, could reflect the estimation of the maturity level of the seven years old children.

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