

Physical Development and Physical Ability of 12-13 Years Old Pupils with Mental Dysfunction

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The purpose of the present study is to explore physical development and physical ability of 12-13 years old pupils with mental disease, involved in a specialized APA program during school hours of physical education.

The research sample consisted of 21 pupils having mental dysfunction. Fourteen of them were involved in three APA sessions a week. The control group included 7 pupils, who do not take part in physical education and sports classes.

The involvement of pupils in a specialized APA program during physical education classes decreases the unfavorable consequences of hypodynamy, improves their physical development and physical ability, which is due to the faster physiological changes.

Key words: APA, physical development, physical ability, intellectual disabilities.

Kids with intellectual disabilities (ID) want to develop their skills to the best of their abilities. They want to go to school, play, and feel support from loving families and good friends. The problem of personality development through sports for children with developmental delay is especially acute as far as social attitudes towards these children are concerned. When external social influence is missing, the children with special needs cannot develop their normal capacities, their internal and external human nature. The control, monitoring and analysis of structural and functional changes in the child body is of primary importance for the sports pedagogue. The formative influence and dynamic structural changes under the influence of physical efforts can be observed through morphologic monitoring of physical development of children and adolescents.

The **purpose** of the present study is to explore physical development and physical ability of 12-13 years old boys with ID, involved in specialized APA program (experimental group) and to compare the obtained data with data about pupils of the same age without regular motor activities (control group).

Characteristics of the sample. The tests were carried out with 14 pupils, involved in three adaptive physical activity (APA) sessions a week (experimental group) and 7 pupils, who do not take part in physical education and sports classes (control group).

Methods: measurements were performed for 9 anthropometric and physiometric indicators and 3 skin folds (SF). Three resulting indicators and three indexes characterizing the form and structure of the body were calculated on the basis of these measurements. The measurements were done based on the standard methods of R. Martin and K. Saller.

The following basic anthropometric indicators have been evaluated: length measures, circumferences and physiometric indicators.

Anthropometric indicators

A. Length measures: *Body height; Upper extremity length; Arms span.*

B. Circumferences: *Chest circumference during respiratory pause; Arms circumference (Contracted and Relaxed arm); Thigh circumference.*

C. Physiometric measures: *Weight; Hand strength.*

Cutaneous folds (CF): *Of the triceps of the arm; Of the biceps of the arm; Of the thigh.*

Calculated anthropometric measures: *Contractile difference (CF); Arm muscle volume (AMV); Thigh muscle volume (TMV).*

Calculated indexes: *Index of the relative values of arm span to body height; Index of the difference between arms span and body height in absolute values (arms span - body height) in cm; Body – mass index (BMI).*

Physical ability testing: *Dash race 50 m – low start; Standing long jump with both legs; Standing high jump with both legs; Pushups until failure; Bending depth (flexibility); Highest number of squats for 20 sec.*

Results and Discussion

The extensive knowledge of physical development and age-related patterns in the development of physical qualities of children and adolescents is a precondition for building up adequate physical ability of pupils with ID for action in different situations. The sports training management for school age children and adolescents requires the study of these patterns in their age-related aspect.

The data from the study are processed using alternative analysis.

The body height as a basic anthropometric indicator describes not only the degree of physical development, but also determines body size (Tabl. 1). Endogenous factors – endocrine glands activity and heredity - play a leading role for the change in height during ontogenesis. Exogenous factors like physical activity, nutrition, climate and others have lower influence.

Table 1

Results from the anthropometric measurements

Sample Indicator	Experimental Group (n = 14)	Control Group (n = 7)	Difference
	\bar{X}_1	\bar{X}_2	$d = \bar{X}_2 - \bar{X}_1$
Body height	154,21	153,71	-0,5
Length of upper extremity	68,75	68,25	-0,5
Arms span	176,25	176,0	-0,25
Chest circumference	75,5	73,0	-2,5
Arm circumference, relaxed	22,28	25,78	3,5
Contracted arm circumference	25,11	24,28	- 0,83
Thigh circumference	52,5	49,25	-3,25
Body weight	59,5	63,5	4,0
Strength of the upper extremity	30,5	23,0	-7,5

Another basic anthropometric indicator, characteristic for physical development, is body weight. It depends to a higher degree on external factors – motor activity and nutrition, which makes it an important indicator for a healthy lifestyle. For our sample, the average body weight is 63,5 kg for the control group and 59,5 kg for experimental group.

Involvement in sports is of high importance for the development of the chest cage – not only for its higher circumference, but also for the improvement of the functional capacity of the respiratory system. Boys without motor activity have average chest circumference of 73 cm during respiratory pause, and for the experimental group of pupils, this indicator is 75,5 cm.

The lower extremity muscles are influenced not only by the process of growth, but also by the applied physical efforts. For the sample studied by us, we obtained values of 49,25 cm for control and 52,5 cm for experimental group.

The contractile difference between relaxed and contracted arm is much more expressed for pupils involved in APA – 2,83 cm. For the other group, the average value of this indicator is 1,5 cm. The difference of 1,3 cm shows the better capacity of brahium muscles of boys in experimental group, which can be ascribed to their better participation in classes of physical education and sports. Comparing the thickness of subcutaneous fat tissue of pupils with APA training and

without motor activity, we can note that it is higher for children in the control group, which also have higher body weight values.

Table 2

Results from the measurement of skin folds in mm

Sample	Experimental group (n = 14)	Control group (n = 7)	Difference
	\bar{X}_1	\bar{X}_2	$d = \bar{X}_2 - \bar{X}_1$
Triceps of the arm SF	8,78	9,75	0,97
Biceps of the arm SF	3,89	4,5	0,61
Thigh SF	11,5	12,25	0,75

The results of the six performed physical ability tests are presented in Table 3.

Pupils, involved in APA are faster. Their average time for 50 m race low start is 9,5 sec and it is better by 1,36 sec than the time of pupils of the same age that are not involved in sports.

Table 3

Results of physical ability tests

Sample	Experimental group (n = 14)	Control group (n = 7)	Difference
	\bar{X}_1	\bar{X}_2	$d = \bar{X}_2 - \bar{X}_1$
50 m race	9,5	10,86	1,36
Long jump	201,2	198,25	-2,95
High jump	50,0	48,75	-1,25
Pushups	18	9	-9
Bending depth	105,3	104,5	-0,8
Squats per 20 sec	17,7	14,5	-3,2

The average value of the pushups test for pupils in experimental group is 18 times and this is higher by 9 than the achievement of the control group. The generally better training of pupils in experimental group is also expressed in the results of the test for squats per 20 sec. They made 17,7 squats compared to 14,5 for the control group. The higher speed and explosive strength of

the lower extremities leads to a natural difference of 1,2 squats per 20 sec in favor of pupils involved in APA.

Conclusion

The negative consequences of increasing hypodynamy and the need for harmonious physical development require the stimulation of motor activities of pupils beyond school hours by participation in new and interesting sport forms. The physical education programs should be revised with a view to achieve higher quality of real communication with pupils with different impairments in order for them to participate more actively in physical education classes and to achieve the development of their potential capacities of high efficiency in the motor activities. It is important to ensure that the children have an optimal schedule of intellectual and motor activities, which would result in their correct physical development, in strengthening their health and increasing their overall work ability.

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