DEVELOPMENT PROGRAMME MOTOR FUNCTION OF CHILDREN WITH MENTAL RETARDATION

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Annotation. *Purpose:* to study the rehabilitation program recovery of motor function of children with mental retardation. *Material-methods:* the study involved 19 students from primary diagnosis - mental retardation. Age of children was 8 - 9 years and 9 - 10 years. Motor speed detection reaction carried out using a falling line setting (in cm.) Determination of speed integral motor actions performed with running 30 meters to go. From cross-country test also used the shuttle run 4x9 meters. *Results*: a program of exercise for children with mental retardation. Exercises aimed at correcting the basic movements, flexibility correction, correction and development of coordination abilities, adjustment and development of physical fitness, correction and prevention of secondary fractures. *Conclusions*: it was found that the rehabilitation program for development and correction of motor function of children with mental retardation is an effective and affordable to adjust coordination abilities and flexibility.
Keywords: mental development, delay, function, movement, coordination, flexibility, recovery, correction.

Introduction

The problem of health protection, comprehensive and harmonious development of children, especially disabled children and children with mental-physical abnormalities, in order to ensure their full-fledged progress and future life in modern social-economic conditions – the task of the first importance of society, which can be solved by combined efforts of specialists in physical education, medicine, psychologists, speech pathologists [1, 2, 3].

Mentally defective children are characterized with polymorphous symptoms: immature of complex forms of behavior, defects of purposeful functioning against the background of increased exhaustion, reduced workability, encephalopathy disorders [9, 10, 11]. Such children have motor awkwardness, disorders of fine motor functions, unbalanced emotional tonus, characteristic sharp change of mood, tearfulness, bent to apathy [22, 24, 25, 26].

Such children have very complex process of inter-sensor links' formation, kinks, which ensure, in particular, such complex functions and reading and writing. Distortion of processes of perceiving and processing of sensor information condition disadvantages of imagination sphere, visual and especially hearing memory, difficulties in space orientation [4, 16, 17, 18, 19].

It is known [1, 2, 3, 24], that intensification of defective children's motion functioning permits to increase afferent impulses into centers of motion information's processing and in motion centers themselves up to appropriate norm. It facilitates full fledged formation of immature brain structures [20, 21]. Just owing to this fact development and implementation of rehabilitation program for defective children's motion functions is rather urgent.

The research was carried out as per "Combined plan of scientific & research works in sphere of physical culture and sports for 2011-2015" by topic 2.4. "Theoretical-methodic principles of individualization in physical education and sports" (state registration number 0112U002001), and by state financed by Ministry of education & science, youth and sports, scientific research work for 2013-2014 "Theoretical-methodic principles of application of informational, pedagogic and medical-biological technologies for formation of healthy life style" (state registration № 0113U002003).

Purpose, tasks of the work, material and methods

The purpose of the work is to give ground for rehabilitation program for defective children's motion functions.

The methods of the research: analysis and generalization of scientific-methodic literature; medical-biological methods of research; pedagogic observation; pedagogic experiment; methods of mathematical statistics.

Determination of motion response's quickness was carried out with the help of holding of falling rule (cm). Quickness in whole motion actions was determined with 30 meters' run. Among running tests there was also test "shuttle" run 4x9 meters.

Medical characteristics of schoolchildren's contingent, which was involved in pedagogic experiment is as follows. In 2011 we conducted pedagogic experiment ion the base of Snizhianska comprehensive boarding school for orphans and defective children deprived of parents' care in Donetsk region. The experiment covered 19 schoolchildren with main diagnosis "immature mental development" of 8-9 years old age (as on period of 2011-2012),; in 2012-2013 academic year children's was 9-10 years old. It should be noted that alongside with diagnosis F.81.3 (immature of mental development) the whole spectrum of diseases was found by medical doctors. In 2012-2013 two schoolchildren (S.B. and S.G.) left barding school in connection with their adoption. Their place was engaged by newly entered pupils Ya.P. and A.K.

In experimental group 11% of children were the members of 2nd health group, 67% - of 3rd and the rest – two pupils – formed the 4th health group. In control group 20% of pupils were the members of 2nd health group, the rest – 70% - the members of the 3rd health group. Among diseases, which accompanied main diagnosis "immature of mental development" there were diseases of respiratory system *(chronic adeno-tonsilitis, expressed tuberculosis test results);

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in control group 30% of pupils had eye diseases (far sightedness). Significant part of pupils suffers from bedwetting and diseases of cardio-vascular system. As per criterion "main features of behavior" 56% of experimental group pupils and 80% of control group were characterized by mobile type of behavior.

Results of the researches

Specificities of content of rehabilitation program for development and correction of defective children's motor functions are as follows. It was recommended to supplement physical education lessons at Snizhianska comprehensive boarding school for orphans and children, deprived of parents' care with exercises [5, 6, 7, 8, 11], which were oriented on correction of main movements; correction of flexibility; correction and development of coordination; correction and development of physical fitness; correction and prophylaxis of secondary disorders (see fig.1).

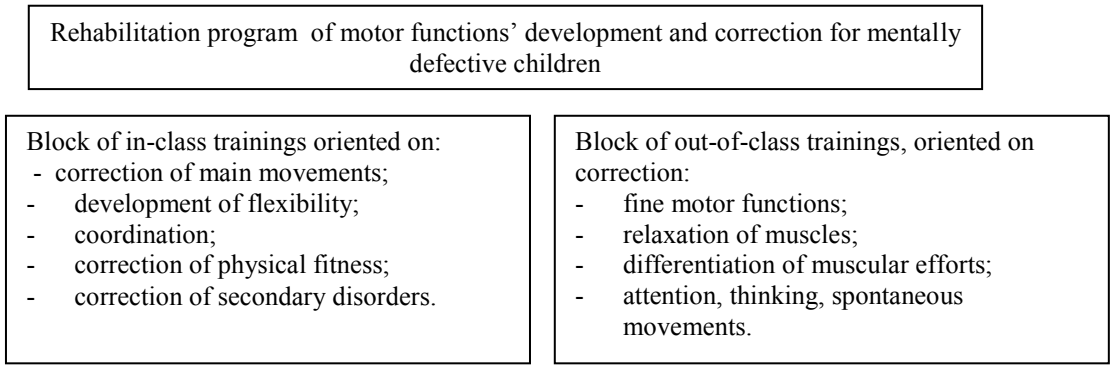

Fig.1. Diagram of orientation of program for motion functions' development and correction of mentally defective children

The recommended by us exercises were used at lessons of physical education, at out-of-class trainings during health related physical culture hour from 16-20 to 17-00 because targeted emotional game loads renders especially stimulating influence on organism of mentally defective child in comparison with other means of physical education [12, 13, 14, 15]. Outdoor game is not only a counter effect to hypokinesia, which accompanies a child with any disorders of development, but also facilitates recreation of health (speed of brain structures' mature increases), strengthening of all organism functions, prophylaxis of somatic diseases. Especially valuable these games because it can simultaneously influence on motor and mental components of trainees.

Health related-physical culture hour was planned in the following way: three times a week (Monday, Wednesday, Friday) we used correcting games, with breathing exercises at final part of every training. The last three times a week (Thursday, Tuesday, Saturday) health related-physical culture trainings included exercises for fine motor functions ("finger games"), with relaxation exercises at final part. In rehabilitation program we used games of type "Stop-exercise", which required from children to stop all movements, maintaining with it posture, expression of face, straining of muscles at the moment of game signal.

Evaluation of dynamic of motor functions' indicators with implementation of rehabilitation program in educational process.

It was determined that children of Snizhianska comprehensive boarding school for mentally defective orphans and children, deprived of parents' care, of Donetsk region have satisfactory physical condition. Indicators of body length, body mass, chest and head circumferences as well as calculated indices (with exclusion of Ketle's index for both groups) are in the range of satisfactory for healthy, normally developed children of 8-9 and 9-10 years old age.

Quickness of motion response was measured with the help of holding of a falling rule (cm). This indicator was characterized by significant amplitude and was in average 28.75±2.02 cm for experimental group of junior schoolchildren; 26.89±1.96 cm – for control group ($p>0.05$). As per the data of L.L. Kharchenko (2004) this indicators of junior mentally defective schoolchildren was 24.5±0.47 cm and as per literature data [11,12,16] indicator 22 cm is considered "excellent" and 33 cm – as "satisfactory". I.e. this indicators of Snizhianska comprehensive boarding school for mentally defective orphans and children, deprived of parents' care, of Donetsk region was in the range of "good".

Quickness indicator in whole motion actions in 2011 (30 meter run) was within from 5.0 sec (V.Sh.) to 8.8 sec. (S.B.)

In 2012 range of this indicator was 0.4 sec (0.5 sec – V.Sh.1 – 5.9 sec. – O.K.) With it, when passing control normative "30 meters run" results in 2008 distributed as follows: "high level" – 1 pupil (11%), "sufficient" – 1 pupils (11%), "middle" – 3 pupils (33%), "low" – 4 pupils (45%).

When passing this normative in 2012, results distributed as follows: 2 pupils, 22%, (D.K. and V.Sh.1) had "high level" (12 points), 6 pupils (67%) had "sufficient" level and 1 pupil (11%) – "middle" level.

In control group, in 2011, we noted a little bit less range of this indicator's variation: from 5.0 sec (M.Zh.) to 6.3 (D.P.). Though, in average of the sample it was 5.87±0.21sec. and confidently did not differ from experimental group ($p>0.05$).

In 2012, in control group (n=10) two pupils showed worsening of whole movements' quickness by 0,2sec. (M.Zh.) and by 0.5 sec. (D.P.). Much better results were shown by pupil O.K. (5.5 sec. against 7.0 sec in 2011). By level of competence, results of 30 meters run (sec) were the following in 2011: "high" – 3 pupils (30%), "sufficient" – 3 pupils (30%), "middle" – 3 pupils (30%), "low" – 1 pupil (10%).

In 2012 results of this normative distributed in the following way: "high" – 4 pupils (40%), "sufficient" – 5 pupils (50%), "middle" – 1 pupil (10%), "low" – no results.

With comparing of our results with data of other authors, who researched this indicator, testing mentally defective and healthy children, it was revealed that analogous data were obtained by G.M. Shamardina et.al. [17] – 6.5±0.06 sec. for children of comprehensive boarding school No.2 of Dnepropetrovsk. A little worse results were obtained at High North (comprehensive school No.4, Korotchayevo st., Novourengoyskiy district, Tumenska region) – 7.3±0.71 sec. (as per the data of T. A. Bobyliova, 2004). However, Zh.K. Kholodov (2002) gives value 5.1 – 7.1 sec. I.e. by this indicator mentally defective children lag behind normally developed peers by 40-45% and correspond to indicator, which is satisfactory for children of 7 years old age (M.A. Novikova, 1997); some of them, on the contrary, have higher level of quickness (5.4 -0 5.1) that corresponds to "high level" of healthy children.

The determined by us dynamics (average data of sample) of coordination of Snizhianska comprehensive boarding school for mentally defective orphans and children, deprived of parents' care, of Donetsk region for 2011-2012 witnesses that in experimental group in indicator improved by 1.88 sec, in control – by 1.59 sec., though percentage of pupils with "high level" results in control group was less after experiment: 50% against to 89% in experimental group ($p<0.05$).

Static balance – ability to keep stable posture- of junior schoolchildren, who participated in experiment, was lower in comparison with healthy people (20-22 sec). Indicator of static balance of experimental group after experiment was 18.6±1.42 sec.; in control it was 17.8±1.69 sec. ($p<0.05$). In experimental group this indicator was by 2.4 sec. better than in comparison with data of L.L. Kharchenko, in control group it was better by 1.6 sec. Though, comparing with healthy children it was worse by accordingly 2.4 and 3.2 sec.

Rather significant lagging in regulation of movements were found by us during Hed's test, which was conducted for mentally defective junior schoolchildren. For example, quantity of mistakes, which were made by pupils looking in mirror, reached, in average, in experimental group to 7.9±0.45 mistakes; in control group – 8.1±0.39 mistakes and was nearly at the same level that was noted by T.A. Bobyliova in her work for children from High North (8.1±0.62 mistakes). In 2012 this indicator improved by 7% ($p<0.05$) in experimental group and by 5% in control ($p>0.05$). Though literature data witness that for healthy children Hed's test resulted in 4.3±0.41 mistakes.

Indicator of flexibility, which was determined with forward torso bent from sitting position (cm), in average was for experimental group in 2011 3.55±0.99 cm, for control – 4.82±1.02 cm ($p>0.05$) that corresponds to average level of this indicator for healthy children (Zh.K. Kholodov, 2002).

In spite of the fact that average-sample indicator for experimental and control groups does not confidently differ ($p>0.05$), within separate sample (group of children), it has rather wide range of variation – up to 8-9 cm. In connection with rather low indicators of flexibility, in 2011, we recommended to physical culture instructor to practice differentiated approach in choosing of exercises for development of this physical quality.

It should be noted that during 2012 flexibility of experimental group children improved from 3.5 cm (average data of sample for 2008) up to 16.5 cm (2009), i.e. 4.7 times ($p<0.001$), or by 13 cm. achievements of children were also rather significant: from 9 to 17 cm. Confident improvement of this indicator was registered in control group as well: 2.7 times, or 7.5 cm ($p<0.01$). Thus, sensitive period of flexibility's development of mentally defective children coincides with the same period of healthy children (of 9 – 10 years old age). Targeted development of flexibility improved 2 and more times indicators of initial testing of 8-9 years old age children.

Thus, indicators of some motion functions of junior schoolchildren have confidently improved.

Conclusions:

1. The developed by us and recommended for implementation in educational process rehabilitation program for development and correction of motor functions of mentally defective children is effective and accessible for correction of coordination and flexibility.

2. Current control of some motor functions in the process of rehabilitation program's implementation in educational process permitted to determine confident improvement of such indicators as flexibility and coordination (on example of normative "shuttle run 4x9 m", sec.). It was determined that sensitive period of flexibility's development of mentally defective children coincides with the same period of healthy children (of 9 – 10 years old age). Targeted development of flexibility improved 2 and more times indicators of initial testing of 8-9 years old age children. It is connected with improvement of ability to relax muscles – an integral condition of optimal and more coordinated spontaneous movements.

The prospects of further researches imply improvement of rehabilitation program for motion functions' correction of mentally defective children.

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