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Influence author methodic teaching swimming on coordination quality of children 6–10 years old with hearing disabilities

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Purpose: *to determine the influence of the author's methodic of teaching swimming on coordination skills of children with hearing disability of primary school age.*

Material & Methods: *in 20 deaf children's who are studies in special school of Lviv region we make experimental and control groups, and defined the level of static balance by methodic of Romberg and Bondarevskyy, preserve the active balance while walking on the increase by test «Walk on gymnastic beam» and comprehensive display of coordination skills we used test «Three somersaults forward». The survey was conducted before and after the implementation of our methods of teaching swimming.*

Results: *revealed low level of capacity to preserve static balance and ability to preserve the active balance while walking on the increase at the beginning of research.*

Conclusion: *the defined positive impact of the methodic of teaching swimming in deaf children of experimental group according to results of static balance.*

Keywords: *deaf, coordination, primary school age, swimming*.

Introduction

The younger school age is the period of formation and development of intellectual, mental and physical properties of organism of a child. For this reason this period is important for the creation of motive compensations and correction of the broken functions of organism which arose in consequence of a defect. The analysis of references showed that pathological processes which arise in the acoustical system change the function of vestibular mechanism, which in turn, influences the formation of the motive sphere of children with defects of hearing, and, as a result, such children are characterized by low indicators of vestibular firmness (that is brightly shown in lag in the development of coordination qualities) [1; 2; 8; 9; 11]. Besides, it is established by the numerical pedagogical researches and supervision that, except the main defect, children with defects of hearing, often have available and associated diseases [1; 3; 9].

Classes by systematic physical activity promote the harmonious development and creation of compensations in children with disability [3; 5; 7; 11; 12]. The problem of motive correction of coordination qualities of deaf children of younger school age was considered on examples of use of game sports, outdoor games, kinds of gymnastics (H. E. Gurinovich (2007), S. M. Fedorchak, L. K. Kozhevnikova and M. Yu. Korzhevsky (2009), A. A. Ivakhnenko (2011) [6]. Swimming as improving means, which action is connected with specific properties of the water environment, is the powerful component of physical education of children including children with violation of the acoustic analyzer as promotes the development of all physical abilities, and also develops ability of organism to opposition to adverse factors of environment [10]. The efficiency of use of swimming in work with children with disability is proved by experts on physical education. So, D. F. Mosunov, A. V. Kubasova, L. Ya. Kovalyova (2004) lead up the efficiency of swimming in work with children with deviations of mental and physical health. The positive influence on cardiovascular, respiratory systems, musculoskeletal system and mental processes of deafs, are lead up researches and supervisions of D. F. Savkin (2010), O. V. Revyakina (2012), O. M. Fetisov (2013) and others [5; 6] in work with children with defects of hearing signal, use of swimming is not allocated as means of correction of vestibular mechanism and correction of coordination abilities however.

Purpose of the research

To define influence of the author's technique of study of swimming on coordination qualities of children of younger school age with defects of hearing.

Material and Methods of the research

The researches were conducted on the basis of specialized educational institutions (SEI) for children with defects of hearing of the Lviv region, in which 20 deaf children of younger school age took part. Children were divided into two groups: experimental and control, about 10 deaf pupils, in whom there were no associated diseases, from which on 2 girls and 8 boys in everyone entered each of which. Pupils who were included into the experimental group attended swimming classes twice for a week, and children of the control group two times for a week – classes on game sports (soccer, volleyball, basketball). All children couldn't to swimm for the beginning of the research. Methods: analysis, generalization, synthesis of references, medicobiological.

We did statistical processing of results of researches by means of standard package of the SPSS for Windows 13 application program, using the standard statistical methods.

Results of the research and their discussion

The analysis of scientific sources showed that pathological the processes which arise in the acoustical system change function of vestibular mechanism, than influence the formation of the motive sphere at children with defects of hearing [1; 2; 3; 7; 9 but other]. So, the specific development of the motive sphere of children of this category what is shown in lag at the development of all physical qualities, and also small motility, coherence of movements separate body elements in time and space, switching of movements, differentiation and rhythm of movements, relaxations by difficulty of preservation of static and dynamic balance that generally is the lag in development of coordination qualities, are shown in the pedagogical researches, which have got the generalization in the works of B. Sermeyev (1982), L. Shapkova (2003), S. Evseyev (2005) and others [4; 8; 9].

We used the following tests: Romberg and Bondarevsky's difficult test, tests «Warking on the gymnastic balance beam», «Three somersaults forward» for the definition of level of development of coordination qualities. The choice of these tests and functional tests is predetermined by their availability and clearness to performance for deaf children.

We carried out these tests at the beginning of the research and through 20 tainings after physical education.

We used the test «Warking the gymnastic balance beam» for the purpose of determination of ability to store active balance when walking on increase.

For the results of our research, the output data at children of EG were on average estimated at 1,9±1,1 points, and children of CG had 1,9±0,9 points ($p>0,05$).

Apparently from the table 1, 40% of children of EG and 30% of pupils of CG showed result which answers assessment in 3 points by the beginning of trainings in the pool. 10% of pupils in each of groups could not perform this task at the beginning of our research. 30% of pupils of EG and 20% of pupils of CG did not perform task up to the end, and 20% of pupils of EG and 40% of pupils of CG showed very unstable walking at which almost fell from the block and did from 2 to 4 stops at distance, such result was estimated then at 2 points.

The average point of the test «Warking on the gymnastic balance beam» improved on 1,2 points after swimming classes at pupils of EG and makes 3,1±0,73 points ($t=–6,00$; $p<0,01$) which is still characterized as unstable walking on the gymnastic balance beam and need to stop when passing distance.

Analyzing the absolute measures after swimming classes, we found out that 30% of pupils of EG performed this task with assessment 4 points after swimming classes, that is walking on the balance beam was a little not accurate, at the same time they did not carry out any stop.

Half of pupils (50%) of EG performed this task for 3 points where pupils still carried out stops during the test, 20% of pupils of EG showed result which is estimated at 2 points, however, it should be noted that these pupils could not execute this test in general by the beginning of classes swimming, at the same time falling from the balance beam having hardly begun task, and such actions were estimated at 0 points.

The repeated inspection of walking on the gymnastic balance beam at pupils of KG showed that the gain makes 0,2 points, and average value makes – 2,1±0,7 points ($t=1,96$; $p>0,05$). 50% of children of younger school age with defects of hearing which were included into the control group could perform this task with result in 2 points at the repeated inspection, in 30% of children of younger school age with defects of hearing in CG we observed unstable walking on the balance beam which is estimated at 3 points. Another 20% of children of CG for the period of completion of research could not reach the end of the balance beam. And though generally the test «Warking on the gymnastic balance beam» after 20 classes remains still difficult to performance for 20% of children of younger school age of EG and for 70% of pupils of CG, and it is difficult for these children to store active balance when walking on height, nevertheless according to this test we can see the best indicators concerning ability to store active balance during walking on height at pupils of EG, than in CG ($t = 9,00$; $p<0,01$).

We carried repeatedly out the test "Three somersaults forward" for identification of changes of rather complex manifestation of coordination abilities. If the average value at pupils of EG made 11,42±6,3 s at the beginning of our research, but was defined as the low level of complex manifestation of coordination abilities, then now, after carrying out twenty classes in the pool, pupils spend on 2,5 s less that makes 8,9±2,4 s ($t=1,92$; $p>0,05$), it is also characterized as the average level of manifestation of coordination abilities.

We observed the low level of manifestation of coordination qualities as at them average time on performance of this task made 12,4±6,7 s in the control group for the beginning of the research. The repeated indicator of the test "Three somersaults forward" is on 1,8 s smaller day off, and the average time of its performance by children of the control group makes 10,8±2,9 s now ($t=1,85$; $p>0,05$), it is also characterized as the low level of manifestation of coordination qualities. And though here we do not observe the reliable changes at children of both groups, nevertheless the tendency to improvement of complex manifestation of coordination qualities at children of EG is more expressed.

Having carried out repeatedly the difficult test of Bondarevsky after 20 swimming classes, we found out at children of EG that indicators of static balance according to this test at the examined children improved as when standing with opened and blindly a little. Actually, we obtained the data which spoke about low manifestation of coordination qualities at pupils both groups by the beginning of our research. So, the indicator of test of Bondarevsky made 4,5±2,5 s, and on left – 3,4±2,3 s at contents of the provision with open eyes on the right leg at children of EG. Blindly on the right leg, children could stay 1,4±1,7 s, and on left – 1,0±1,2 s. Besides the analysis of absolute measures by the beginning of study of swimming in this group of children showed that 40% of pupils could not perform this task blindly and 10% of pupils of EG by the beginning of study of swimming, could not perform this task with open eyes.

The standing indicator on the right leg with EG with opened

Table 1

Change of indicators of the test "Warking on gymnastic balance beam" in EG and CG (n_1=n_2=10)

Points and meanings	Before		After	
	EG	CG	EG	CG
0 – the child falls from the balance beam, having hardly begun the task	1/10	1/10	0/0	0/0
1 – The pupil falls from the balance beam, without having reached the end	3/30	2/20	0/0	2/20
2 – Very unstable walking on the balance beam. The pupil almost falls. 1 or more time can stop. On execution of the test more than 6 seconds are allotted	2/20	4/40	2/20	5/50
3 – Unstable walking on the balance beam. 1 or more time stops. To end of the test requires more than 6 seconds	4/40	3/30	5/50	3/30
4 – Something unstable walking on the balance beam. He finishes the test within 6 seconds	0/0	0/0	3/30	0/0
5 – Perfect walking on the balance beam. Balance is not necessary to check. The pupil finishes the test till 6 seconds	0/0	0/0	0/0	0/0

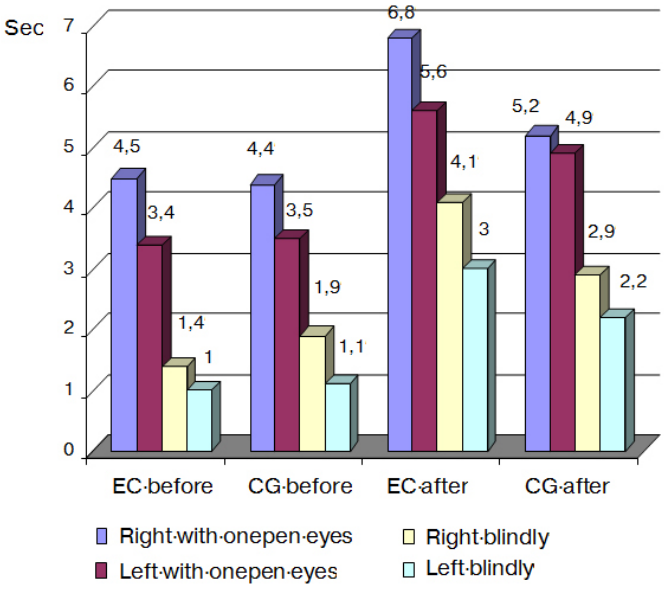
Note. *In numerator – the number of pupils, in denominator – percentage ratio.*

eyes at children improved on 2,3 s and made 6,8±2,1 s (t=–6,73; p<0,01) after study to swimming, and the indicator of maintenance of motionless position on the left leg improved also on 2,2 s that makes – 5,6±1,7 s (t=–8,82; p<0,01). Also indicators of maintenance of the provision on one leg blindly improved. The indicator on the right leg increased on 2,7 s, and now made – 4,1±1,4 s (t=–10,37; p<0,01), and the indicator at contents of the provision on the left leg increased on 2 s and made 3,0±1,05 now s (t= –9,48; p<0,01). Children of CG for the beginning of the research when performing the test of Bondarevsky held situation with open eyes on the right leg 4,4±2,3 s, and at repeated inspection this indicator improved on 0,8 s and made 5,2±1,7 s (t=–2,05; p>0,05). These could stay 3,5±1,9 s on the left leg with open eyes by the beginning of the researches, and this indicator improved on 1,7 s and made 5,2±1,7 s in 20 classes (t=–5,25; p<0,05). At children of CG we also observed improvement of results at contents of the provision on one leg blindly. So, they could stay 1,9±1,2 s on the right leg by the beginning of the research, and the result of the repeated research improved on 1 s, and makes – 2,9±1,1 s (t= –3,87; p<0,05). When standing on left, the initial indicator made 1,1±0,9 s, and the repeated one improved also – on 1, 2 s, and makes–2,1±0,7 s (t= –4,74; p<0,05). Besides 30% of pupils could not carry out the test of Bondarevsky blindly and in CG for the beginning of carrying out our research (pic. 1). That is all children began to carry out the difficult test of Bondarevsky after classes.

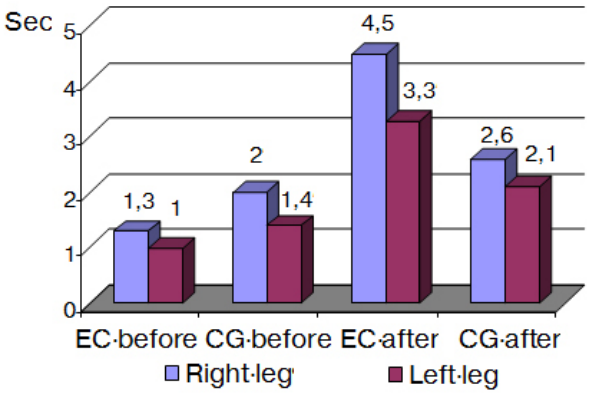
And though the data, which are obtained by us during the repeated inspection, still speak about the low manifestation of static balance at children of both groups, however we observed the bigger gain of these indicators when performing the test of Bondarevsky at children of EG, than at children of CG.

The average value of test of Romberg on the right leg made 1,3±1,25 s, and on left – 1,0±0,8 s by the beginning of swimming classes at pupils of the experimental group that is estimated at 2 points and answers assessment «unsatisfactorily» as children could not hold motionless situation over 2 seconds.

The gain at contents of the motionless provision on the right leg at pupils of EG makes 3,2 s, and average value of this test makes 4,5±1,26 s (t=–9,79; p<0,05) after carrying out swimming classes. The improvement of result makes 2,5 s, and the average value – 3,3±1,5 s (t=–8,35; p<0,05) on the left lower extremity (pic. 2).



Pic. 1. Change of indicators of the difficult test of Bondarevsky at children of younger school age with defects of hearing of both groups



Pic. 2. Change of results of the test of Romberg at children with defects of hearing of both groups

Rather the control group, the average value of the difficult test of Romberg made 2,0±1,1 s on the right leg and on left – 1,4±0,8 s by the beginning of our research. The repeated inspection of pupils of CG showed that the gain at contents of the provision on the left leg makes 0,7 s, therefore the value of the test of Romberg makes 2,1±0,7 s now (t=–3,28; p>0,05), and on the right leg – 0,6 s, and standing on this leg averages 2,6±0,8 s (t=–2,25; p>0,05). Thus, such results in the experimental and control groups on data of the difficult test of Romberg, as well as by the beginning of our research, are estimated further at 2 points and answer assessment «unsatisfactorily» as pupils could not hold motionless situation over as 5 s. However we observe the best indicators of the gain of static balance and according to the difficult test of Romberg, at the same time it is smaller at pupils of CG.

Conclusions

As a result of the carrying out research, it was established that the offered author's technique of study swimming of deaf children of younger school age has the positive effect concerning ability of preservation of static balance according to Romberg's test ($p<0,01$) and to the manifestation of coordination abilities by the result of the test «Walking on the gymnastic balance beam» ($p<0,01$).

The prospect of the subsequent researches consists in deeper studying of influence of means of swimming for physical condition of children with defects of hearing.

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