

IMPACT OF RECREATIONAL SWIMMING ON PHYSICAL CONDITION OF THE VISUALLY IMPAIRED JUNIOR PUPILS

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Abstract

In the article the comparative analysis of physical development and physical preparedness of visually impaired schoolchildren of junior age comes true after application of the health swimming and his influence on the bodily condition of children. An important problem in the period of development of the functional systems of organism is strengthening of health of children of midchildhood, as general bases of health are mortgaged exactly in this period of life, that it is especially important for children that have defects of sight, as at the marked pathology functional possibilities of organism and level of capacity below, than in healthy. Basic motions provide the health of children, their normal development and physical perfection. A correction and in deminification of lacks of physical development and physical preparedness of visually impaired children adequately influenced the health swimming on the bodily condition of children, to what indexes testify got during an experiment. On questioning of parents and teachers, application of the health swimming influenced also on reduction of catarrhal diseases among children, that was marked on the visit of school lessons. The results of our researches testify to the necessity of application of the health swimming, that must take the important place in the complex of measures on the aim of strengthening of health of children, improvement of motive internalss, prophylaxis of secondary diseases of visually impaired students of midchildhood.

Key words: health swimming, physical development, physical preparedness, visually impaired junior schoolchildren.

Тетяна Цюпак, Юрій Цюпак, Фелікс Філак. Вплив оздоровчого плавання на фізичний стан слабозорих школярів молодшого віку. У статті здійснюється порівняльний аналіз фізичного розвитку та фізичної підготовленості слабозорих школярів молодшого віку після застосування оздоровчого плавання і його впливу на фізичний стан дітей. Важливою проблемою в період розвитку функціональних систем організму є зміцнення здоров'я дітей молодшого шкільного віку, оскільки саме в цей період життя закладаються загальні основи здоров'я, що особливо важливо для дітей, які мають вади зору, оскільки при зазначеній патології функціональні можливості організму і рівень працездатності нижчий, ніж у здорових. Забезпечують здоров'я дітей основні рухи, їх нормальний розвиток і фізичне вдосконалення. Корекція та компенсація недоліків фізичного розвитку і фізичної підготовленості слабозорих дітей оздоровчим плаванням адекватно вплинула на фізичний стан дітей, про що свідчать показники, отримані в ході експерименту. За опитуваннями батьків і вчителів, застосування оздоровчого плавання вплинуло також на зменшення застудних захворювань серед дітей, що відзначилося на відвідуванні шкільних уроків. Результати наших досліджень свідчать про необхідність застосування оздоровчого плавання, яке повинно зайняти важливе місце в комплексі заходів із метою зміцнення здоров'я дітей, поліпшення рухових якостей, профілактики вторинних захворювань слабозорих учнів молодшого шкільного віку.

Ключові слова: оздоровче плавання, фізичний розвиток, фізична підготовленість, слабозорі молодші школярі.

Татьяна Цюпак, Юрий Цюпак, Феликс Филак. Влияние оздоровительного плавания на физическое состояние слабовидящих школьников младшего возраста. В статье осуществляется сравнительный анализ физического развития и физической подготовленности слабовидящих школьников младшего возраста после применения оздоровительного плавания и его влияния на физическое состояние детей. Важной проблемой в период развития функциональных систем организма является укрепление здоровья детей младшего школьного возраста, так как именно в этот период жизни закладываются общие основы здоровья, что особенно важно для детей, имеющих недостатки зрения, поскольку при указанной патологии функциональные возможности организма и уровень работоспособности ниже, чем у здоровых. Обеспечивают здоровье детей основные движения, их нормальное развитие и физическое совершенствование. Коррекция и компенсация недостатков физического развития и физической подготовленности слабовидящих детей оздоровительным плаванием адекватно влияли на физическое состояние детей, о чем свидетельствуют показатели, полученные в ходе эксперимента. По опросам родителей и учителей, применение оздоровительного плавания повлияло также на

уменьшение простудных заболеваний среди детей, отметились на посещениях школьных уроков. Результаты наших исследований свидетельствуют о необходимости применения оздоровительного плавания, которое должно занять важное место в комплексе мероприятий с целью укрепления здоровья детей, улучшение двигательных качеств, профилактики вторичных заболеваний слабовидящих детей младшего школьного возраста.

Ключевые слова: оздоровительное плавание, физическое развитие, физическая подготовленность, слабовидящие младшие школьники.

Introduction. At the present stage of life the burden on all the sense organs, and especially vision increased. This led to a large number of people with impaired vision (myopia, hyperopia, nystagmus, etc.). There is a large number of children of primary school age among them. According to statistics, 3 % of children in the early years of training already have visual impairment. Till 3–4th form, this indicator rises to 10 %.

The drawbacks in physical development of impaired people are explained by functional abandonment of motor analyzer and by methodological imperfection of teaching children such physical exercises [6].

Analysis of the scientific and methodological literature showed that the works of researchers are devoted to the question of visual correction and rehabilitation usage in the classes with visual impaired children [4; 9]. A number of works of contemporary scholars devotes to the impact of different types of motor activities such as swimming [8] dancing [5], outdoor games [3], music and gaming activities [1] on the health of blind and visually impaired children.

There was found by numerous studies that methodically properly organized classes with special tools usage contribute largely to correct and compensate movement disorders and drawbacks of physical development of visually impaired children [4; 8; 10]. Experts offer several methods of process optimization for learning new exercises and using all sorts of technical devices [7].

Indeed, an important issue during the development of functional organism's systems is to strengthen children's health, because in this period of life lay the foundations of general health.

Purpose of assignment is to study the impact of recreational swimming on the physical conditions of the visually impaired junior pupils.

Results of the Research. Discussion. Recreational swimming is an effective means of hardening against sudden temperature fluctuations and colds, to improve the functionality of the organism. The usage of recreational swimming on purpose to correct the physical condition of children with visual impairment has preventive and healing effect.

Several authors note the favorable properties of water as the effective means of rehabilitation and improvement of physical fitness [6; 8]. Water reduces weight, lows the load on the joints and spine. In addition, it creates pressure on the human body in all directions, fights back during the person's movement, making them smoother, and relieves pain in muscles during exercises. According to some authors [9; 10], one of the most effective means of influencing the human body in health purposes should be considered in terms of motor activity of the aquatic environment. With swimming dosage one can increase stability of organism's biosystems to a variety of diseases, and especially to acute respiratory infections.

Scientists M. M Bulatova and K. P. Sahnovskyy [2] note that swimming influences positively on the condition of blood vessels. During the swimming the elasticity of the lungs increases, bronchi and alveoli are trained, the size of the chest, lung and vital capacity also increases. Water environment has a great tonic effect on the nervous system.

Several authors [2; 9; 10] investigated the role of medical swimming in the cardiovascular and nervous systems, bronchi and lungs diseases have developed the technique using a set of exercises in the water, which helps to prevent disease and improve the body.

In turn, this contributed the adaptation of organism not only to swimming, but also to other types of physical activity. Classes in the pool with a temperature of 27 ° C cause positive changes in thermoregulation system, contributing the adaptation to cold.

Despite the considerable number of scientific works to study features of development, movement disorders' structure, teaching methods, forms of correction, their effects on motor activity of impaired people require further scientific study of problems of improvement and correction of physical development, physical fitness, formation and development of all functional systems, corrections of other deviations in young students with visual impairments, because this is the age when physical qualities develop the most. Therefore, early rehabilitation of the child's development defects is considered particularly important, and

the usage of recreational swimming as a prophylactic and healthful means of young children with visual impairments very relevant.

In the study, which lasted 6 months, children with visual impairments took part in it. Due to ungraded classes, in which students of one class are combined with others with varying degrees of vision loss and different age, experimental results are presented without division by year and sex.

Recreational swimming classes were conducted by the standard method twice a week and included three parts. Preparation of the lesson was conducted ashore and consisted of general development exercises, special and simulation ones. The main part was held in the pool and included exercises at the banking board, swimming with recommended methods and styles to influence the functional systems of the organism, games in order to make an impact on the emotional and mental health of children. The final part of the session consisted of loosening up exercises and relaxation.

Anthropometric indicators are commonly used to control the state of health. The constitutional characteristics of the body are the external reflection of the functional relationship systems.

The results of our studies found that body length of primary school children with visual impaired analyzer was $127, 1 \pm 2, 08$ cm before using the recreational swimming. During the experiment the growth rate of students increased to $129, 1 \pm 2, 81$ cm.

As seen from the data presented in table 1, the average body weight of children with visual impairment amounted to $25, 4 \pm 0, 83$ kg before the experiment and $26, 9 \pm 0, 80$ kg after it.

Table 1

Indicators of Physical Development in junior Pupils with Visual Impairment (n=15)

Indicators	Before Experiment			After Experiment			P
	\bar{X}	s	m	\bar{X}	s	m	
Weight, kg	25,4	0,83	0,21	26,9	0,80	0,21	<0,001
Height, cm	127,1	2,08	0,54	129,1	2,81	0,72	<0,01
Chest circumference, cm	61,07	0,86	0,22	63,24	0,81	0,21	<0,001
VC, ml	1537,0	61,81	15,96	1774,0	121,1	31,26	<0,001
HR beats. / min	91,13	3,11	0,80	83,67	2,82	0,73	<0,001
Dynamometry of right hand, kg	10,33	1,11	0,28	12,5	0,71	0,18	<0,001
Dynamometry of left hand, kg	9,70	0,99	0,26	11,07	0,68	0,17	<0,001
Strength index, %	40,67	0,47	0,15	46,47	1,06	0,33	<0,001
Life index, ml / kg	60,51	1,11	0,35	65,95	1,31	0,42	<0,001

Averages of chest circumference before the experiment were $61, 07 \pm 0, 86$ cm; after – $63, 24 \pm 0, 81$ cm; the difference of indicators was 2,17 cm.

It is known that an important indicator of external breathing is vital capacity (VC), which is determined to characterize the functional ability of the pupils' respiratory system of children at rest. It depends on the sex, age, body size and fitness. As the researchers D. O. Sylantsev, N. H. Baykina [8] point out, visually impaired children have vital capacity 10–20 % less than healthy ones.

As a result of the experiment, indices of functioning of the cardiovascular and respiratory systems of the examined students have changed.

The study found that the average VC of the primary school children with visual impairments amounted to $1537,0 \pm 61,81$ ml before the experiment. After a six-month health – improving swimming lessons the average VC of the primary school children with impaired vision amounted $1774,0 \pm 121,1$ ml, indicating improvement of these indicators on the average of 237,0 ml.

One of the most important parameters to characterize the functional state of the respiratory system is to determine its reserve capacity. These capabilities we tried to predestined according to ratio of the VC – indexes up to body weight (life index).

According to our information, this index of children in the primary school who are visually impaired was $60,51 \pm 1,11$ ml / kg before the experiment and $65,95 \pm 1,31$ ml / kg - after the experiment; difference forms 19,28 ml / kg. This difference in marks of life index, in our opinion, can be explained by the fact that children with vision disorders began to lead a movable lifestyle during the experiment.

Average heart rate at baseline of the experiment was $91, 13 \pm 3, 11$ beats / min. As a result of children's recreational swimming lessons this index decreased to $7,46$ beats / min and at the end of study was $83,67 \pm 2,82$ beats / min, indicating the adaptation of children's organism for adequate regular physical activities.

An important feature that is included in the assessment of children's physical development is an indicator of muscle strength. We found that the average power of left and right hands after the experiment increased to $2,17$ kg and $1,37$ kg respectively.

However, absolute characteristics of muscle strength are not informative enough, because examined children differ in mass and physique. Therefore, to assess the reserve capacity of the muscle system there was used the relative value of a stronger hand to body weight – power index. According to our results, average power index of primary-school children with visual impairments amounted to $40, 67 \pm 0, 47$ % before the experiment and $46, 47 \pm 1, 06$ % after the experiment, the difference is $5,8$ %.

So due to the evaluated point for physical development and physical training of junior children with disorders of the visual analyzer after recreational swimming, positive changes are marked. Recreational swimming adequately influenced on the level of children's somatic health that indicates the necessity for further implementation of health events with them.

There were used tests for studying the physical readiness of primary-school children with visual impairments, with the help of which the most important movable qualities of children were determined – speed, flexibility, agility and endurance.

On the advice of a specialized boarding – school doctor for pupils with vision disorders the test duration should not exceed 30 seconds. Therefore, the test for determining strength, which is performed by from a prone position for 1 minute, we did not use in our research.

Table 2 shows the results of motive tests that characterize the physique of junior pupils with disorders of vision.

Table 2

Indicators of Physical Fitness of junior Pupils with Visual Pathology ($n = 15$)

Motive Test	Before the Experiment			After the Experiment			P
	\bar{X}	s	m	\bar{X}	s	m	
Running on the spot for 5 sec, motions/min	14,11	1,15	0,30	15,96	1,01	0,26	<0,001
Shuttle run 4×9 m, sec	13,49	0,80	0,21	12,36	0,79	0,20	<0,001
Throwing the ball in the goal, times	4,53	0,99	0,26	5,93	0,88	0,23	<0,001
Body incline from sitting position, sm	0,71	0,64	0,17	1,93	0,78	0,20	<0,001
Rufje's Test, y. o.	8,31	0,87	0,22	7,07	0,88	0,23	<0,001

Results of our research indicate that the level of development of the basic physical qualities of the junior students with visual impairments, which were conducted before and after the experiment, had positive upheaval. Thus, after the implantation of the recreational swimming on purpose to improve the physical condition of the visually impaired children, running on the spot – indicators for 5 seconds improved to $1,85$ movements / min.

Many authors note that age period from 7 to 12 years is the most favorable for the skills development. Shuttle run 4×9 m children performed $1,13$ sec. faster than before the experiment; indicators of the throwing the ball in the goal improved by $1,3$ times. Particularly significant improvements were observed in the flexibility development. Body incline from sitting position children improved to $1,22$ cm.

Although due to Rufje's test indexes of endurance improved after the experiment for $1,24$, but index evaluation corresponds to the meaning of the average productivity before and after the experiment.

Besides, in consequence of a survey of parents and teachers, the children began to have less respiratory-viral aches, which recorded on the school absence because of illness.

Thus, the results of our research indicate a necessity for recreational swimming purposely to afforce children's health, disease prevention, improvement movable qualities with impaired primary-school children.

Conclusions. After applying health-improving swimming intentionally to improve the physical condition of primary-school children with disorders of the visual analyzer improvements of indexes of physical development are marked: the average VC increased by 237,0 ml; difference of circumference indicator of the chest after the experiment was 2,17 cm; indicators of strength of right and left hands increased by 2,17 and 1,37 kg respectively.

Also are marked positive changes in characteristics of physique, so indicators of the running on the spot for 5 seconds improved to 1,85 motions. / min. Particularly significant improvements were observed in the development of flexibility, children improved body incline up to 1,22 cm.

Although due to Ruffe's test indexes of endurance improved after the experiment for 1,24, but index evaluation corresponds to the meaning of the average productivity before and after the experiment.

During the autumn and spring periods when an increase of catarrhal sickness is remarked, was recorded the reduction of the number of missing lessons almost doubled.

So, recreational swimming adequately impact on the level of physical health and physique of primary - school children with visual disorders and indicates the feasibility of its implementation in complex of corrective events with these children.

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