

MAINTAINING FUNCTIONAL HEALTH AND POSTURE DURING DISTANCE EDUCATION FOR PRIMARY SCHOOL CHILDREN

Liudmyla Shuba¹, Victoria Shuba²

¹«Zaporizhzhia Polytechnic» National University, Zaporizhzhia, Ukraine, mila.shuba@gmail.com

²Prydniprovsk State Academy of Physical Culture and Sports, Dnipro, Ukraine, shubaV14@meta.ua

<https://doi.org/10.29038/2220-7481-2021-02-107-111>

Abstracts

The modern rhythm of life requires from the body well-coordinated work and respond to changes in various spheres of life. The COVID-19 encourages distance education, which contributes to the sedentary life style of children. The success of a pupil's education is determined by his level of health, especially for primary school children. One of the main aspects of the body normal functioning is the correct posture. This special aspect became the subject of research. **The Purpose of the Study is** – experimentally test the method of using carriage exercises and maintaining the optimal level of functional status for primary school children during distance education. **Research Organization.** The study was performed from March 2020 to June 2020 at the premises of collegium «Elint», Zaporozhye. It was attended by 71 boys aged 7–8 who were divided into experimental (n=36) and control (n=35) groups, all boys were classified in the main medical group. **Results.** The data obtained during the research revealed both positive (shoulder index and Kettle index) and negative (Ruffier's functional test) dynamics in students during distance learning. But the best result was shown by the experimental group, due to the fact that during the construction of the methodology, we took into consideration not only sensitive development, but also those aspects that would motivate the children before classes. **Conclusion.** The established problem of the researched question allowed to develop a method of using carriage exercises and maintaining the optimal level of functional status for primary school children during distance education. Noticed that the developed method has really positive influence, easy to use and can be applied by all members of society.

Key words: correct posture, pupils, distance education, method.

Людмила Шуба, Вікторія Шуба. Збереження функціонального здоров'я та постави під час дистанційного навчання учнів початкової школи. Сучасний ритм життя потребує від організму чіткої роботи та вміння реагувати на зміни в різних сферах життя. Пандемія COVID-19 спонукає до дистанційного навчання, що сприяє малорухливому життю учнів. Успішність навчання школяра за багатьма чинниками визначається рівнем стану його здоров'я, особливо це стосується дітей початкової школи. Одним із головних аспектів нормального функціонування організму є правильна постава. Цей особливий аспект і став нашим дослідженням у рамках дистанційного навчання учнів початкової школи. **Мета дослідження** – експериментально перевірити методику використання вправ формування правильної постави та підтримки оптимального рівня функціонального стану в дітей початкової школи під час дистанційного навчання. **Організація дослідження.** В експерименті брав участь 71 хлопчик 7–8 років (експериментальна група – 36, контрольна група – 35), діти за станом здоров'я віднесені до основної медичної групи. Дослідження проводили на базі Запорізького колегіуму «Елінт». **Результати.** Отримані дані протягом дослідження виявили як позитивну (плечовий індекс та індекс Кетле), так і негативну (проба Руф'є) динаміку в учнів під час дистанційного навчання. Але найкращий результат показала експериментальна група, це пов'язано з тим, що під час побудови методики ми врахували не лише сенситивний розвиток, але й ті аспекти, які б мотивували дітей до занять. **Висновки.** Установлена проблемність досліджуваного питання дала змогу розробити методику формування правильної постави та підтримки оптимального рівня функціонального стану в учнів початкової школи під час дистанційного навчання. Відзначаємо, що розроблена методика дійсно має позитивний характер, легка в застосуванні та може використовуватися всіма представниками соціуму.

Ключові слова: правильна постава, учні, дистанційне навчання, методика.

Людмила Шуба, Вікторія Шуба. Сохранение функционального здоровья и осанки при дистанционном обучении учащихся начальной школы. Современный ритм жизни требует от организма четкой работы и умения реагировать на изменения в различных сферах жизни. Пандемия COVID-19 располагает к дистанционному обучению, способствует малоподвижной жизни учеников. Успешность обучения школьника по многим факторам определяется уровнем состояния его здоровья, особенно это касается детей начальной школы. Одним из главных аспектов нормального функционирования организма является правильная осанка. Этот особый аспект и стал нашим исследованием в рамках дистанционного обучения учащихся начальной школы. **Цель исследования** – экспериментально проверить методику использования упражнений формирования правильной осанки и поддержания оптимального уровня функционального состояния у детей начальной школы при дистанционном обучении. **Организация исследования.** В эксперименте участвовал 71 мальчик 7–8 лет

(экспериментальная группа – 36, контрольная – 35), дети по состоянию здоровья были отнесены к основной медицинской группе. Исследование проводилось на базе Запорожского колледжума «Элинт». **Результаты.** Полученные данные в ходе исследования обнаружили как положительную (плечевой индекс и индекс Кетле), так и отрицательную (проба Руфье) динамику у учащихся при дистанционном обучении. Но наилучший результат показала экспериментальная группа, это связано с тем, что при построении методики мы учли не только сенситивное развитие, но и еще аспекты, мотивирующие учащихся к занятиям. Установлена проблемность изучаемого вопроса позволила разработать методику формирования правильной осанки и поддержания оптимального уровня функционального состояния у детей начальной школы при дистанционном обучении. Отмечаем, что разработанная методика действительно имеет положительный характер, легкая в применении и может использоваться всеми представителями социума.

Ключевые слова: правильная осанка, ученики, дистанционное обучение, методика.

Introduction. A child's health the resistance expression of the growing organism to extreme and painful influences. At each stage of ontogenesis, stability is determined by achieving optimal compliance with the basic physiological functions of the body [3; 4; 9].

Children's health can be considered as a dynamic and functional state and as an indicator of effective vital function. It can also be a reflection of the child's lifestyle and interests [1; 2; 12].

It is well-known that the child's and teenager's health is formed with a number of important factors. Experts [3; 5; 9] identify four groups of factors which influence on the children's health formation: lifestyle – 50 %; genetic background – 20 %; environment – 20 %; health intervention – 10 %.

Today introduces new requirements for modern life. The COVID-19 is forcing for distance education. Taking into account that the child is constantly studying using the computer, the posture begins to change, which negatively influence for the normal functioning of the musculoskeletal system and internal organs. This effect is especially observed in primary school children. The child's body at each stage of development is a complex biological system, the formation of which is a natural prerequisite for studying and education [1, 3, 4]. According to scientists [2; 8; 9; 11], the primary school age is a responsible period of a child's development, when character is formed, worldview is expanded, and the foundation of health for the future life.

An important biological feature in the children's development is that the formation of functional systems occurs much earlier than required. The precautionary principle aimed at the development of all functional systems and organs is a kind of «insurance» that nature gives to man in case of unforeseen circumstances. These questions are important for understanding the development of mechanisms for the physiological functions regulation and nervous activity. Physical development of children is associated with the improvement of their mental health, so a decrease in physical health often affects the ability to study [1; 5; 6; 10].

In our opinion, health is a combination of the physical, emotional, social, intellectual and spiritual world of a person, and the ability to use it to fight the negative effects of the environment.

In this regard, the problem of developing is a scientifically sound method of using exercises for the formation of correct posture and maintaining the optimal level of functional status during distance studying for children of primary school age.

Material and Methods. *The purpose of the study is* – experimentally test the method of using carriage exercises and maintaining the optimal level of functional status for primary school children during distance education.

Participants. The study was performed from March 2020 to June 2020 at the premises of collegium «Elint», Zaporozhye. It was attended by 71 boys aged 7–8 who were divided into experimental (n=36) and control (n=35) groups, all boys were classified in the main medical group.

Organization of Research

When constructing the method in the experimental group, we used exercises that leveled the one-sidedness' development, associated with the specifics of learning curve at the computer.

The developed method consists of four sets, which were conducted in the form of games with child's favorite music and changed every three weeks. But in order for the child to feel comfortable when changing the set of exercises, we left a few exercises from the previous set.

It is important to remember that sitting for primary school children is not a rest, but an act of static charge. Wherethrough the extensor muscles in a child's body are still weak, the child gets tired quickly from sitting and has a desire to change posture or run. Lack of fresh air and constant stress on the back during longtime sitting are harmful to posture. During longtime sitting, the child's head presses on the spine and the intervertebral cartilages are compressed. It hurts the spine and the pupil scrunches. Children who lead an active lifestyle do not have such problems. Therefore, taking into account the specific of distance education,

we focused on the choice of exercises that helped maintain the correct posture in pupils of the experimental group:

- exercises near the vertical surface – the child performs various dynamic exercises (arms retraction and legs abduction in the different sides, rise on toes, two-leg squat) or isometrics (toughen muscles 3–6 seconds, and relax muscles 6–12 seconds);
- over-grip hanging (in the standing and sitting position, the spine is under pressure, and to reduce it, you should hang on the chinning bar);
- exercises near a mirror or with a mirror surface if on the street;
- exercises to movement co-ordination – «swallow stand scale», tight-rope walk, head-balance walk, pivot, crouch stand, all these exercises pupil can do with or without equipment;
- exercises with a skipping-rope, stick or hoola hoop.

That's why, a pupil was positive about the changes in the complex and always ready to perform the following proposed exercises. But the selected physical exercises were appropriate not only in terms of physiological and functional orientation, but also in terms of education and aesthetic. Due to the large number of exercises in physical education, the developed complexes could be performed at indoor and outdoor [7]. Special equipment and a lot of space are not needed.

Systematic training of the spine and abdominal muscles has delivered the result.

The pupils in the control group performed standard exercises, which did not take into account the emotional state, the features of distance education and sedentary lifestyle in the exploration period.

Taking into account that in research was involved the children from primary school who were interested and dreamed of studying as much as possible that we prepared a theoretical part, where we told interesting facts about each exercise. This helped stimulate pupils' motivation and attention during the exercises. It was proposed to perform complexes every day of the week in order to make it a positive habit that will promote a quality life.

The visual method and the measurement technique were used to determine the posture condition [13]. During simple examination was checked: the height of the shoulder lines and its location, the lower corners of shoulders and their lag from a thoracic cage, the form of the gleams formed by internal surfaces of arms and a trunk. In research, to assess the correct posture, the pivotal role was calculating the shoulder index (measured shoulder width and shoulder arches). Measurements were done every month. This test was chosen because in the country was non-standard situation (March-May 2020 – distance education and limited communication), so that parents themselves could check and record their own child's index. And also in order to draw attention to the positivity of using simple but effective exercises for the correct posture. In research calculated the mass-growth index of Kettle (IK), which was used to assess the level of physical development of children [13].

To determine the level of physical performance and function of the cardiovascular system, we offered parents a Ruffier's functional test. The peculiarity of this test is that after a relatively small load is determined cardiac rate in different reduction period. To perform the test, the cardiac rate of the child was measured for 15 seconds (P1) in a sitting position. After that during 45 seconds the pupil performed 30 squats, bringing his hands forward. Following the exercise in the sitting position, the cardiac rate was calculated for the first 15 seconds (P2) and the last 15 seconds (P3) of the first minute of the reduction period. Also, due to the personal conduct of the selected test, parents were able to determine to which group their child's health belongs.

Statistical analysis of data was carried out using the SPSS Statistics program.

Results. One of the important tasks of children's physical culture is to teach them to breathe properly during exercise. The main condition for proper breathing is the correct position of the body when sitting at a desk, standing, walking, it means correct posture. Spine breaks down normal activity of lungs, as consequence less air, and oxygen is absorbed. That's why, proper posture is very important at every stage of life.

Analyzing obtained data of the experimental and control groups, respectively: March – 90,2 % and 90,3 %; April – 93,6 % and 91,1 %; May – 95,8 % and 91,2 % note that they correspond to the norm in terms of «correct» posture (norm of 90–100 % of the values of the shoulder index). But the experimental group significantly improved the result, which will contribute to better work of the musculoskeletal system and internal organs.

Analyzing obtained data of the Kettle mass-growth index, we note that the coefficients of variation V up to 7,36 % fluctuations in the results were insignificant. According to the obtained data, we can say that the groups are homogeneous.

The analysis of the obtained data revealed that before the experiment all groups had a low level of the Kettle index. After the experiment, the data increased to the average, both in the experimental and in the control, respectively: 16,72 % and 8,51 % ($p < 0,05$). But in the experimental group the data was higher due to the use of the developed method.

For high-quality and productive research of the child's body, we determined physical performance. Physical performance is an integrative expression of human capabilities, refers to the concept of health and is characterized with a number of objective factors. But in a narrower sense, physical performance is considered as a functional state of the cardiovascular and respiratory systems. This approach is fully justified by people who do not go in for sports.

Assessment of children's physical performance by Ruffier's functional test before the experiment characterizes the average level of indicators in both control and experimental groups. This indicates that all children who take part in our research were classified in the main medical group.

According to the results of re-testing of physical performance, the Ruffier's functional test, obtained the next results after the introduction of the experimental method. The results in the experimental group remained positive. Test data were confidently placed at the position of the average 71,58 % and above the average 28,42 % levels for assessing physical performance ($p < 0,05$). The control group also showed changes, but unfortunately the data displace to the position of the average 55,62% and below the average 44,38 % level for assessing physical performance ($p < 0,05$). Such data changes indicate that the children of the experimental group had more active lifestyle due to the introduction of the developed method, which they performed every day, despite distance studying and limited communication.

The health-improving effect of physical exercises is observed only in those cases when they are rationally balanced in terms of orientation, power and volume in accordance with the individual capabilities of children. Exercise activates improve metabolism, improve the activity of the central nervous system, ensures the adaptation of the cardiovascular system, respiratory and other systems to the conditions of muscular activity, accelerates the entry into operation and functioning of the circulatory and respiratory systems, and reduces the duration of functional recovery after variation caused by exercise.

Discussion. The deterioration of the health of children in Ukraine largely depends on such factors as economic instability in the country, environmental pollution, poor nutrition, lack of health intervention. A particularly important factor is lifestyle [1; 4; 10].

The formation of a child's health is known to be a controlled process, so the health can be purposefully influenced by physical education. But this requires a deep knowledge of functional and age-specific features [3–6].

Shoulder index data taken during the experiment were in the experimental and control groups, respectively: March – 90,2 % and 90,3 %; April – 93,6 % and 91,1 %; May – 95,8 % and 91,2 % note that they correspond to the norm in terms of «correct». But in our opinion, if the research lasted longer, the data of the control group could easily go beyond the «correct» posture given the sedentary lifestyle at that time.

In our research, the data obtained by the Kettle index after the implementation of the developed method were arranged as follows – in the experimental group the indicators increased by 16,72 % ($p < 0,05$), and in the control group only by 8,51 % ($p < 0,05$). His difference in data growth corresponds to research in the chosen direction – L. Lopes, R. Santos, B. Pereira, V. Lopes, (2013); M. Schmidt, F. Egger, V. Benzing, K. Jäger, A. Conzelmann, C. Roebbers, C. Pesce (2017); L. Shuba (2016). Because for primary school children, movement is very important, which has a positive effect on weight and height.

According to scientists – A. Gaetano (2016); A. Ghyppo, S. Tkachov, O. Orlenko (2016); N. Khan, C. Hillman (2014); A. Van der Niet, E. Hartman, J. Smith, C. Visscher (2014), only schoolchildren with a high level of physical fitness have a safe level of somatic health, which guarantees the absence of diseases, the decrease of which is accompanied by a progressive increase in morbidity and a decrease in the body's functional reserves.

Physical performance testing before and after the research unfortunately confirmed our concerns.

The data of the Ruffier's functional test in the control group became lower (position average 55,62 % and below average 44,38 % level for the assessment of physical performance ($p < 0,05$) under the influence of distance learning, because it led to a sedentary lifestyle. On the contrary, the data of the experimental group improved due to the developed method – the position of the average 71,58 % and above the average 28,42 % level for the assessment of physical performance ($p < 0,05$). The data obtained indicate that we not only confirmed the research of scientists – J. Best (2010); A. Ghyppo, S. Tkachov, O. Orlenko (2016); D. Kirk (2010); M. Schmidt, F. Egger, V. Benzing, K. Jäger, A. Conzelmann, C. Roebbers, C. Pesce (2017), but also supplemented them.

One of the ways to solve situation may be the possibility to increase the body's resistance to the unfavorable environment by means of physical education.

Conclusion. The analysis of the literature revealed that leading native and abroad physiologists, educators, doctors and other experts believe that physical activity is one of the main factors influencing health, physical perfection and development, helps to optimize the adaptive properties of pupils. The use of various methods and means of physical culture is the main direction in the scope of physical education.

It should be noted that in the primary school age the foundations of a person's character, his attitude to work and sports, attitude to moral, ideological and cultural values are formed. That's why, at this time, it is very important to instill a child's love for physical culture, learn to move properly and beautifully, be able to perform various exercises, develop and become a physically strong person. The child should be brought to this gradually: by properly selected means and methods of developing certain motor abilities according to the existing sensitive periods, constantly monitor how the child perceives and performs the exercises, how these exercises affect its further development and interest in their implementation.

Of great importance is the team working with parents, who for the first time in their lives took indicators for each test and performed exercises with their children. This experience contributed to a more positive attitude towards the means of physical education.

The results presented in the article testify to the effectiveness of our developed method of using carriage exercises and maintaining the optimal level of functional status for primary school children during distance education.

Conflicts of interest. The authors declare that there is no conflict of interest.

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Стаття надійшла до редакції 07.05.2021 р.