

Publication date: 01.12.2022

DOI: 10.51871/2782-6570_2022_01_04_5

UDC 769.922; 612.062

THE EFFICIENCY OF RECOVERY MEASURES IN THE REHABILITATION OF 7-9 YEARS OLD CHILDREN WITH RESPIRATORY DISEASES IN SANATORIUM CONDITIONS

V.V. Kostyaeva, N.A. Chulyukova

Russian State University of Physical Culture, Sports, Youth and Tourism, Moscow, Russia

Annotation. The article describes the use of restorative measures in a sanatorium in 7-9 years old children with respiratory diseases, the effectiveness of which is expressed in improving the performance of the respiratory system. Positive changes were noted in the study of lung capacity and peak expiratory flow, indicating the effectiveness of the measures used in the study population with bronchopulmonary pathology at the stage of sanatorium treatment.

Keywords: rehabilitation, recovery measures, respiratory system, children, respiratory diseases, sanatorium conditions.

Introduction. Among diseases of respiratory organs in children of different age groups bronchopulmonary diseases account for about 30-40% of cases of the detected pathology [1-2]. In recent years, there has been an increase in the number of patients in the patient group of frequently ill children (FIC) and children with bronchial asthma (BA) [1-3].

There is also an increase of not only in the incidence of respiratory allergic diseases, but also in a number of children with severe allergic diseases [3]. Moreover, the clinical profile has a tendency for progression, which, as the child grows up, would significantly undermine physical and psychoemotional health on further stages of ontogenesis [3-5]. It serves as a factor of social limitation, reduces the quality and entirety of life.

The abovementioned indicates the relevance of applying recovery measures at earlier age possible with the inclusion of subsequent and systemic recovery at all stages of the process, considering the resort potential of sanatorium treatment [6-7].

The purpose of this study – assess the effectiveness of therapeutic physical culture measures in the recovery of 7-9 years old children with respiratory diseases.

Methods and organization. In order to achieve the goal, we have implemented research methods that evaluate the effectiveness of natural and preformed physical factors in the treatment of children with respiratory

allergic diseases: analysis of scientific and methodological literature, pedagogical observation, spirometry (identification of lung capacity – LC, l), peak expiratory flow (PEF), math-and-stats methods. The statistical data processing was made with the Statistica 7.0 software. We have calculated mean values ($\bar{X}$) of the indicators, as well as derivation values (σ). Significance of results obtained was identified with the Student T-test when $p < 0.05$.

The study was conducted in the S.M. Kirov Sanatorium, located in Kislovodsk, during the “Child’s health” program.

The study included 16 children of both genders, aged 7-9 years, who had a history of respiratory diseases. When selecting the participants, we have excluded children with severe bronchial asthma, signs of asthmatic state or asthma attacks during arrival for sanatorium treatment.

Results and discussion. Duration of sanatorium treatment for these children varied from 21 to 30 days. Due to the difference in the length of stay in the sanatorium, a single period for conducting the study was determined – 20 days.

Sanatorium treatment was conditionally divided into 3 stages: initial, main and final.

The initial stage (3-5 days) included the study of the functional state of the respiratory system. We have applied the dose-sparing regimen, taking into account the adaptation of children to the effect of natural and climatic

factors of the resort area, with the inclusion of natural and preformed physical factors and means of therapeutic physical culture.

The second stage (12-14 days) included application of the whole set of sanatorium treatment exercises, the regime of physical activity was gradually expanded, the effectiveness of rehabilitation in improving the health of children with respiratory diseases was tested. From the 5th to the 10th day, the children were transferred to a tonic motor mode, and subsequently, as health was restored, in the second half of the treatment course – to a training motor mode. At the same time, the choice of the physical activity regime was carried out differentially, depending on the period of sanatorium treatment, the individual features of the child, their state of health and physical fitness level, taking into account the ongoing processes of adaptation of the child's body to the natural and climatic conditions of the resort.

Following procedures were included into the program of therapeutic and health-improving measures:

- climatic treatment, including a long (up to 7 hours a day) stay in the fresh air;
- air- and sunbaths (up to 2 hours a day during the first half). Air baths as an effective way of acclimation and increase of body resistance were carried out right before day and night sleep;
- aerotherapeutics were used both at rest (day sleep on fresh air) and in combination with respiratory activity of the child (dosed walks, dosed mounting, outdoor activities). Aerotherapeutics were used in a dosed manner, twice a day for 20-30 minutes, during the first and the second half of the day at the initial stage. At the next stage, the time spent outdoors gradually increased to 5-6 hours a day;
- balneotherapy in the form of carbon dioxide baths, concentration of carbon dioxide – from 0.7 to 1.4 g/l, water temperature – 36°C. The procedures took place every other day in the morning after breakfast, duration of the procedure – 6-8 minutes. The balneotherapy course consisted of eight baths. Children were recommended to receive the procedures no earlier

than 60 minutes after breakfast. They also must rest or lower their motor activity for 30 minutes after the procedure;

- peloid therapy in form of mud applications on the chest with the application of therapeutic mud on the paravertebral block from the cervical to the lumbar spine, temperature of mud applications – 38-40°C. Duration of each mud therapy session was 10 to 15 minutes, 8 procedures total;

- oxygen therapy in form of oxygen cocktails, twice a day – one serving in the morning and one in the evening;

- therapeutic massage was performed in the back area from the shoulder line to the lower corners of the shoulder blades. We have also used techniques of segmental impact on the paravertebral blocks. The massage course consisted of 20 procedures, the time of one session was 8-10 minutes;

- therapeutic physical culture in following forms: morning hygienic gymnastics (MHG), therapeutic gymnastics (TG) during the first half of the day, respiratory gymnastics (RG), outdoor games, everyday walks, terrain cure (only when children are adapted to the sanatorium's climatic conditions), walks on the sanatorium's territory (every other day, during the second part of the day, tempo – 70-80 steps per minute.

The third, final stage lasted for 3-5 days. The children were still engaged in therapeutic physical culture, did dosed walks and played outdoor games. Among the applied therapeutic and health-improving measures, the children still received climatic treatment and oxygen therapy. During this time, the final research took place. We have also measured indicators of the functional state of the respiratory system of the children, who received rehabilitation.

The table below demonstrates dynamic changes in the studied indicators that occurred during rehabilitation in children aged 7-9 years with respiratory diseases.

Functional indicators of the respiratory system of the children with the bronchopulmonary pathology after the rehabilitation course had a positive tendency for improvement.

Table

Dynamics of the respiratory system indicators in children aged 7-9 years with the bronchopulmonary pathology during rehabilitation in sanatorium conditions

Indicators	Initial stage of rehabilitation (n=16) ($\bar{X} \pm \sigma$)	Final stage of rehabilitation (n=16) ($\bar{X} \pm \sigma$)	Significance, Student T-test ($p \leq 0.05$)
LC, l	1.3 $\pm$ 0.2	1.4 $\pm$ 0.1	≥ 0.05
Peak expiratory flow (PEF), l/min	211.9 $\pm$ 0.3	215.2 $\pm$ 0.2	≤ 0.05

The LC indicator has increased by 0.1 l ($p \geq 0.05$). The PEF indicator has also significantly increased by 3.3 l/min ($p \geq 0.05$). This indicator demonstrates strengthening of the respiratory muscles that are mainly responsible for exhalation, improvement of the bronchopulmonary tract's patency for exhaled airflow for the studied population of children

after the rehabilitation course in sanatorium conditions.

Conclusion. Improvement of results received during the study indicates the effectiveness of therapeutic and health-improving measures in rehabilitation of children with respiratory diseases at the stage of sanatorium treatment.

REFERENCES:

- Liang N.A., Khan M.A. Medical rehabilitation of children with bronchial asthma. *Allergology and Immunology in Pediatrics*, June 2016, no. 2(45), pp. 7-20. (in Russ.)
- Minina E.S. Bronchial asthma in children: features of treatment and rehabilitation: a monograph. Vitebsk: VSMU, 2017. 275 p. (in Russ.)
- Neretina A.F., Mizernitskij Yu.L., Olejnik E.A. Medical, psychologic-pedagogical and social rehabilitation of children with diseases of respiratory system. *Child and adolescent rehabilitation*, 2011, no. 2(17), pp. 4-10. (in Russ.)
- Kuandykova Zh.T., Lunina N.V. Psychophysiological state of female students of Omsk State University with bronchial asthma assigned in special medical groups. Relevant Issues of Adaptive Physical Culture and Sports. Materials of the All-Russian +Scientific-and Practical Conference, 2017. pp. 182-185. (in Russ.)
- Lunina N.V., Kharchenko L.V., Sinel'nikova T.V., Turmanidze V.G. Evaluation of the functional state of students assigned to special medical groups for health reasons. Diary of self-observation. Omsk, 2016. 2nd edition, stereotypical. 72 p. (in Russ.)
- Liang N.A., Khan M.A., Ivanova D.A., Chukina I.M. The application of the physical factors for the rehabilitation of the children presenting with bronchial asthma. *Questions of Balneology, Physiotherapy and Exercise Therapy*, 2012, no. 6, pp. 47-53. (in Russ.)
- Sokolova E.Yu., Lyubimova L.V. Drainage breathing gymnastics in the treatment of chronic obstructive and non-obstructive nonspecific lung diseases: a study guide. Perm, 2011. 19 p. (in Russ.)

INFORMATION ABOUT THE AUTHORS:

Viktoria Vasil'evna Kostyaeva – Senior Lecturer of the Department of Physical Rehabilitation, Massage and Health-Improving Physical Culture named after I.M. Sarkizov-Serazini, Russian State University of Physical Culture, Sports, Youth and Tourism, Moscow, e-mail: borisova-viktoria@yandex.ru.

Natal'ya Aleksandrovna Chulyukova – Lecturer of the Department of Physical Rehabilitation, Massage and Health-Improving Physical Culture named after I.M. Sarkizov-Serazini, Russian State University of Physical Culture, Sports, Youth and Tourism, Moscow.

For citation: Kostyaeva V.V., Chulyukova N.A. The efficiency of recovery measures in the rehabilitation of 7-9 years old children with respiratory diseases in sanatorium conditions. *Russian Journal of Sports Science: Medicine, Physiology, Training*, 2022, vol. 1, no. 4. DOI: 10.51871/2782-6570_2022_01_04_5