

**THE INFLUENCE OF PROTECTIVE MASK USAGE DURING  
THE PHYSICAL AND DIDACTIC ACTIVITIES ON  
CHILDREN'S HEALTH ON THEIR IN GROWING AND  
DEVELOPMENT**

*Mihai Constantinescu*

*Stefan cel Mare University of Suceava, Romania*

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**Abstract**

Children's respiratory physiology during their period of growth and development, present some aspects specific to the age of the childhood period, where we have some specific characteristics regarding the respiratory rate, heart rate and the dynamics of morphological changes assigned to every period. If during children's growth and development period the functional capacities and possible acquired deficits are ignored, through overload, the growth process is disrupted and the consequences are able to cause harm through the rest of the life regarding health status.

**Introduction**

In order to argue the approach taken regarding the activity of children's respiratory system during the sustained physical activities and their capacity to adapt, it is necessary to present some pediatric physiology aspects. The investigation will be elaborates only to the children that are obligated to wear to protective mask, more precisely beginning with the age of 5-6. From both the morphological and functional point of view it is clear that these children haven't formed a well-established status that could deal with the modifications, overloads induced by this obligation to reduce oxygen consumption. [1,2]

The childhood begins at 6-7 years and end around the age of 10-11 and at the end of this period appear the first changes on the endocrine and nervous system that precede the prepubertal processes.

The dynamic of growth and development during this period and more precisely the prepubertal one comes with a complex of specific changes that aren't always controlled and from here the emergence of diverse conflicts of posture or even functional.

The organs and vital functions continuously perfect themselves, the nervous system improves its structure, it is necessary to be specified that

the bones of the rib cage and spine don't fortify at the same rhythm, which favors the emergence of some growth disorders (lowered shoulders, stuffy chest, round back, lordosis, scoliosis, etc.). It can be remembered that these disturbances in development of the bone system don't only lead to the emergence of some posture deficiencies, but can also affect the cardio-respiratory function or of the nervous system. The muscular system also has an accentuated rhythm of development, along with the nervous system, which explains the dynamism, mobility and desire of having children. [3,5,7,9]

Definitions regarding the growth and development of the children.

N.N. Trifan (1982) defines the process of physical development of the child as a process that begins in the moment of the first division of the fertilized egg and ends in full maturity, when the human organism has accomplished its definite form and is capable of reproduction. The development of the child comprises two distinct periods: the growth and maturity.

- The growth is a quantitative process, translated through the modification of the body dimensions and corresponds with the multiplication of cell nuclei or with the number of cells and the size of the cell volume.

- The maturity is a qualitative change, translated through the modification of structure, composition and functionality of the cells, tissues, organza and the body in totality. There will be pointed some laws of growth and development presented in M. Cordun's work "Kinantropometrie" (2009);

- the law of alternation: processes of growth and development don't take place at the same time, but alternative;

- the law of proportions: the alternative rhythm of growth, specific for each segment or organ, attracts permanently changes of proportions on different component parts of the body;

- the law of unequal and asymmetric growth of the tissues and organs: each organ or tissue has its own rhythm of growth; ;[4,8]

### **The aim and objective of the research**

The aims of the research is to present some negative aspects regarding the state of health of the children, due to the use of a greater period of time of the protective mask during the physical and didactic activities.

Objectives of the research:

- the analysis of literature of specialty regarding the ergophysiology of respiration at children during the growth and development period;
- the identification of methods and means specific to the kinetic regarding the limits of the negative effects induced by morpho-functional structures and of the children's state of health.

### Material and methodology

In order to elaborate of an objective presentation, there will be pointed some aspects of semiology of the children's respiratory function but also its negative effects that are determined by the compulsory of wearing protective masks.

Semiology notions of children's respiratory apparatus:

The respiratory frequency is grown physiologically in the child (new born = 40 +/-5 breaths per minute; at 1 year = 30=/- 6 breaths per minute; at 9 years old= 20 breaths per minute; at 15 years = 18 +/- 2 breaths per minute; above 17 years = 16+/- breaths per minute); it is good the respiratory frequency at a baby or small child to be measured while sleeping; the tachypnea under 2 months = above 60 breaths/minute, between 2 months – 1 year, between 1-5 years = above 40 breaths per minute.[6]

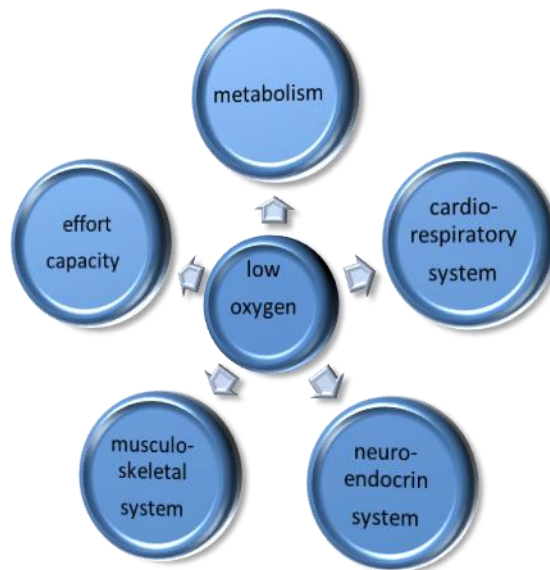


Figure 1.

If we analyze the scheme presented in fig. no. 1, there will be observed which are the systems and appliances that are affected by the modification of parameters of the breathed air and default oxygen that represents the main ingredient of the function of the human body. The modification of parameters of the breathed air, from the qualitative and quantitative point of view puts pressure on the cardio-respiratory system, determining a chain of malfunctions and processes of degradation and decompensation beginning with the neuro endocrine system, the metabolic processes of the whole body, and incapacity of the locomotors defense of sustaining minimal efforts.

In the same context the preventing inhalation of metabolic wastes by default and of CO<sub>2</sub> which results from the respiratory process, by the fact that they are re-inhaled produce a willing intoxication, determining an imbalance at the level of systems of automatic adjustment of the breath and of mechanisms of producing the antibody production necessary to the immunity system.

### **Results and discussion**

Therefore, following the negative effects produced by the protective mask on a well function of diverse vital systems of the body, it is imposed the elaboration of some compensation measures that would balance and reduce the negative effects that were determined by the modifications produced by the respiratory process.

It is presupposed that a child has worn the protective mask approx. 4 hours during the day in a week (5 days), 4 hours representing 1/3 out of 12 hours that is allocated in a working day. Due to the O<sub>2</sub>, which was accumulated in this period, will have to be paid through minimum the same amount of time allocated to some physical activities in fresh air without wearing the mask. Therefore, it is recommended program physical activities, sports or recreation that would take place with at least 1 hour per day or 2 hours in 2 days. This thing must be associated with hydration and supplementary contribution of natural mineral/vitamins, proper rest, activities that would take place in fresh air.

If there are found specific symptoms specific to the respiratory decompensation, the pediatrician or pneumonia should be consulted as appropriate. It must be specified that the modifications of the disturbed functional parameters can lead to pathological modifications cu irreversible character determining some vulnerabilities or even scaffolding to the future adult.

### Conclusions

- The limitation and modification of the parameters of the air breathed determining deregulations in chain over the great functions of the body;
- The prevention of the exhalation of metabolic wastes by default and of CO<sub>2</sub> also produces some disruptions breathing regulation system and limits the capacity of adaptability of the immune system;
- The mechanisms of compensation through the performance of physical activities are necessary in order to compensate the O<sub>2</sub> and to stop the installation of possible pathologies with possible repercussions on the future adult;
- The physical activities can be realized either in a recreational program or sport, but they must be done in specific conditions in order to benefit with the positive influence over the health condition.

### References

1. Corneliu Borundel, Manual de Medicină Internă pentru cadre medii ed. ALL 1995 București p 204-205;
2. Gabriela Ochiană, Kinetoterapia în afecțiuni respiratorii, ed. PIM, Iași 2008;
3. I.Baciu, FIZIOLOGIE, ed. Didactică și Pedagogică, București 1977 p 286-289;
4. Maria Cordun, Kinantropometrie, ed. CD PRESS, București 2009 p. 53-57;
5. Mihai Constantinescu. Kinetoterapia în Afecțiuni Cardio-Respiratorii, caiet de lucrări practice, ed. Universității „Ștefan cel Mare” Suceava 2018 p 10-17;
6. Mihai Constantinescu. Kinetoterapia în Afecțiuni Pediatrice, caiet de lucrări practice, ed. Universității „Ștefan cel Mare” Suceava 2019 p 10-14;
7. Nicolae Evian, Bolile aparatului respirator, ed. Medicală București 1985, p7-24;
8. Trifan N.N. Pediatrie Preventivă, ed. Medicală, București 1982, p 113-136;
9. Vasile Marcu, Mirela Dan, KINETOTERAPIE/PHYSITHERAPY, ed. Universității din Oradea, 2006 p 186-189;