

**THE PREVALENCE OF POSTURAL DISORDERS AND SPINAL DEFORMITIES AMONG  
THE PUPILS IN THE MUNICIPALITY OF BEROVO**

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**Abstract:** The material included in this paper is presented through four basic chapters.

The first chapter covers a review of literature, where are presented the basic features of the spinal cord, the basic anatomical and physiological characteristics, then the terms pathological curvature and spinal deformities are defined. The objectives and methods of kinesitherapy are also outlined. The elements that serve as the basis for the application of kinesitherapy (human habitus, locomotor apparatus, normal attitude, factors that contribute to disturbance of the normal put and the forces that fight it to maintain it in normal). The deformities of the spinal cord, legs, feet are explained in detail.

The second, third and fourth chapters refer to the research section. Here, the goals, materials and methods of work are shown, as well as the results and discussion of postural disorders and bodily deformities, which emphasize the essence of kinesitherapy.

Because of the large volume of the material, especially because of the actuality of postural deformities and spinal deformities, recommendations for further research are given in the last chapter.

**Keywords:** deformities, lordosis, kyphosis, scoliosis, extremities, feet

**Introduction:** One of the unique features that separates people from animals is our unique ability to walk on two legs. Walking on four limbs is more stable, with built-in unnecessary. However, by standing on our hind legs, we can see far higher than other vertebrates from the animal world, and our hands and hands are free to handle tools. The only balance between the flexibility and stability of the spinal column in humans helped in understanding this evolutionary discovery. It's astonishing that this balance is maintained during life-cycle in most of the world's population. By changing this equilibrium, a spinal deformity occurs in one or more platelets of movement, and thus other postural disorders.

Although today there are several methods for measuring the spinal curvature in the sagittal ram, there is a small number of tests that have been tested for metric characteristics, which would give an insight into whether the test measures what it is intended for. For these reasons, an attempt has been made to show the cypholordosimeter pair and the reliability of the measuring instrument, the subject of which is the dorsal kyphosis and lumbar lordosis.

Most anomalies of the locomotor apparatus in school youth caused by various exogenous risk factors are relatively revealing because they do not usually have some visible subjective symptoms, that is, due to the fact that teachers do not perform appropriate measurements at the beginning of each school year in time discover any shortcomings. All this tells how they can be dangerous, because as a rule they always come unannounced. For these reasons, neither the parent nor the child initially require proper medical or other assistance. They seem as if they are not sufficiently aware of the changes that can later have catastrophic consequences on the correct psychophysical development of the child.

Systematic examinations of school children aim to monitor their physical and psychological development, which is at this age the most intense. On such examinations, which are regularly performed in primary and secondary education today, the early spinal deformities of the schoolchildren are covered. They are referred to the Department of Physical Medicine in a timely manner, where their further detection and treatment is successfully managed with the help of kinesitherapy and corrective gymnastics.

Kinesitherapy is a branch of physical medicine and rehabilitation and is one of the most important links in the process of complete functional facilitation of persons, after injuries, diseases or some other condition that has led to disturbance of the normal balance between certain functions in the body.

One of its species, which is most commonly used to remove the disorders in the body, is called corrective gymnastics. It is one of the basic methods used for prevention and correction.

Today, when it comes to kinesitherapy, all preventive and therapeutic activities are meant, the goal of which is to maximize possible damage to the damaged functions of the body. Other suitable environments, such as water, when talking about hydro kinesitherapy, can be used, or basic human activities, so-called occupational therapy (ergotherapy), are also used. The goal of kinesitherapy should not only be local registration and correction of deviations from the normal attitude, but it should also have a broader character as to have a preventive effect.

**The purpose of the research is:** to show the prevalence of postural disorders and spinal deformities among the pupils in the Municipality of Berovo.

**Tasks of the research:**

- To show the percentage of prevalence of postural disorders and spinal deformities in boys and girls;
- To show the percentage of postural disorders and spinal deformities among students of grades I, III, V and VII (primary school) and students of I, II, III and IV classes (high school).

**Materials and Methods:** According to the latest data from the Institute for Public Health of the Republic of Macedonia, in the school year 2016/2017, the number of pupils from elementary and secondary education who were examined, in accordance with the Program for systematic examinations of male students and female students in the Republic of Macedonia for 2016/17, is 119.149 or 96, 1% of the underlying. The coverage of students with systematic examinations in primary schools is satisfactory and amounts to 96.7%. The occupancy rate in secondary education is 94.7%.

In 2016/17, 84,692 primary school students were systematically examined. In the secondary schools in the course of 2016/17, 39,156 students were systematically examined.

In the research in this specialist work, students from primary and secondary schools in the municipality of Berovo and the municipality of Pehcevo were tested. A total of 557 pupils from I, III, V and VII grade (primary education) and 237 pupils from I, II, III and IV classes (secondary education) have been enrolled in total.

**Research Material:** The information on the situation with orthopedic deformities among the students in the Republic of Macedonia was prepared according to the Program for Preventive Health Care for 2017. The classic method for screening the health of school children and youth is the systematic examinations that are organized in the public health institutions by the services of preventive health care and preventive dental care of schoolchildren.

Data on the presence of postural abnormalities and spinal deformities in the Municipality of Berovo and the Municipality of Pehchevo were taken from the archive of PHI "Health House" - Berovo, from the Unit for School Medicine for the period 2016-2017.

Clinical assessment of a patient with a spine deformity begins with an inspection of the face as a whole from 2 to 3 meters distance, in order to get a general picture of the posture, the constitution and the relation of the individual segments of the body.

This inspection is carried out from the front, back - anteroposterior in (frontal plane) and side to (sagittal plane). The person to be observed should be barefooted and slammed under the hips or sports panties so that the back of the shoulder should be visible to the saddle. Also were done clinical examination, Radiographic assessment of the spine and angle of the Rotation.

**Results:**

**Table 1.** Percentage representation of the determined conditions in systematically examined pupils from elementary and secondary education from Berovo and Pehcevo in the academic year 2016/2017.

Education	Total examined	Body deformities and poor body posture	Percentage
Primary	558	308	55,2
Secondary	225	136	60,4
<b>Total</b>	<b>783</b>	<b>444</b>	<b>56,7</b>

Out of the total number of 783 students examined, in 444 there was some kind of deformity of the body or bad bodily posture. The share of students in secondary education is higher, and it rises to 60.4%. In other words, out of 225 examined students, 136 students have deformation or poor physical presence.

**Table 2.** Percentage representation of body deformities and poor posture among primary and secondary school students in Berovo and Pehcevo in school year 2016/2017

Education	Body deformities and poor body posture	
	N	%
Primary	308	63
Secondary	136	37
<b>Total</b>	<b>444</b>	<b>100</b>

The number of body deformities and poor body posture and their percentage in 308 primary school pupils in Berovo and Pehcevo is shown in Table 3.

**Table 3.** Representation of the deformities among primary school students in the city of Berovo and Pehcevo in the academic year 2016/2017

Sex	Deformities of the body		Bad body posture		Total
	N	%	N	%	
Male	117	57,6	47	44,8	164
Female	86	42,4	58	55,2	144
<b>Total</b>	<b>203</b>	<b>100</b>	<b>105</b>	<b>100</b>	<b>308</b>

Table 3 shows that out of 308 elementary school students, 203 (65.9%) have deformities and 105 (34.1%) have poor posture. Of the 203 pupils, with deformity of the body, 117 (57.6%) are male and 86 (42.4%) are females. In poorly positioning the body the situation is reversed, that is, the poor posture of the body is more common among the female students, 58 (55.2%), in contrast to the men with 47 (44.8%).

**Table 4.** Representation of the deformities and poor posture among secondary school students in the city of Berovo and Pehcevo in the academic year 2016/2017

Sex	Deformities of the body		Bad body posture		Total
	N	%	N	%	
Male	33	41,3	24	42,8	57
Female	47	58,7	32	57,2	79
<b>Total</b>	<b>80</b>	<b>100</b>	<b>56</b>	<b>100</b>	<b>136</b>

Table 4 shows that out of a total of 136 secondary school students, 80 (58.8%) have some postural disorder, and 56 students (41.2%) have only poor posture.

As for the prevalence of postural disorders among secondary school students, they are more represented in girls. In 79 (58%) of the girls, some kind of deformity of the body or poor bodily presence is observed. In contrast to boys, that number is 57 (42%).

**Table 5.** Prevalence of postural disorders and spinal deformities among primary and secondary school pupils in the municipality of Berovo and Pehchevo, in the academic year 2016/2017

Education	Municipality of Berovo		Municipality of Pehchevo		Total
	N	%	N	%	
Primary	142	71	61	73,5	203
Secondary	58	29	22	26,5	80
<b>Total</b>	<b>200</b>	<b>100</b>	<b>83</b>	<b>100</b>	<b>283</b>

Postural abnormalities and spinal deformities in the primary education are more frequent in the municipality of Pehchevo (73.5%), while in the secondary it is higher in the municipality of Berovo (29%).

**Conclusion.** The results of the study, which covered a total of 783 primary and secondary school pupils in the municipalities of Berovo and Pehchevo and evaluated a total of 444 students with postural disorders and deformities, indicated a high percentage of representation of bodily deformities.

Out of the total 444 students, 283 students have been diagnosed with body disorders, and 161 have been diagnosed with poor physical presence. Out of 161 pupils who have been diagnosed with a bad body movement, 105 students are from primary school, and 56 are secondary school students. Out of 283 students with diagnosed body disorders, 203 students are from the primary, and 80 are from secondary education.

Postural disorders among primary school pupils are more present among males, unlike those in secondary education, where they are more represented in females. Postural disorders and spinal deformities in primary education are more common in the municipality of Pehchevo, while in the secondary it is higher in the municipality of Berovo.

The research confirms the hypothesis of the importance of systematic examinations and it is confirmed, that is, if regular systematic examinations are made, all postural disorders will be determined and corrected in a timely manner. In order to prevent the large number of pathological conditions found during the systematic examinations, it is necessary to undertake measures for improvement and modernization of the working conditions in the schools (inventory - chairs, desks, etc., whether their height corresponds to the age of the students in accordance with the prescribed standards and norms, the lighting - whether it is sufficient, natural, artificial or combined). Of course, the modern way of life, especially the computer-generated swing, has contributed to the passive, sedentary lifestyle dominating in everyday life, especially among the school population, so it is necessary to influence the change of passively elapsed time in a physically actively programmed time.

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