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## Problem występowania nieprawidłowości postawy u dzieci i młodzieży w rejonie Zielonej Góry i okolic

## The problem of occurrence of faulty postures in children and adolescents in the city of Zielona Góra and the region

### Streszczenie

**Wstęp.** W ostatnich latach w Polsce obserwuje się znaczny wzrost występowania nieprawidłowości w postawie ciała u dzieci w wieku rozwojowym. Są one najczęściej spowodowane wadliwym trybem życia oraz złymi nawykami ruchowymi. Czynniki te wywołują w organizmie reakcję łańcuchową, co doprowadza do utrwalania się wad, a w następnej kolejności może stać się przyczyną rozwoju chorób krążka międzykręgowego a także innych schorzeń. Zbyt późne wykrywanie odchyleń od normy bądź lekceważenie niewielkich zaburzeń w postawie ciała staje się również jedną z przyczyn występowania większej liczby wad postawy. Wczesne wykrycie nieprawidłowości oraz poprowadzenie prawidłowej rehabilitacji może przerwać patologiczny proces przyczynowo-skutkowy.

**Cel.** Celem pracy była ocena częstości występowania zaburzeń postawy w różnych płaszczyznach ciała oraz ocena przykurczu mięśni kulszowo-goleniowych u dzieci w wieku szkolnym na terenie Zielonej Góry i okolic.

**Material i metody.** Badaniami objęto dzieci uczące się w szkołach podstawowych w Zielonej Górze i okolicach. Łącznie przebadano 7781 osób, w tym 3890 dziewcząt i 3891 chłopców. Każda osoba została poddana testom: palcepodłoga, Adamsa, statyki miednicy, Bertranda oraz wzrokowej ocenie sylwetki w płaszczyźnie czołowej, strzałkowej i poprzecznej. Uzyskane wyniki zostały przedstawione w tabeli (liczebność i rozkład procentowy).

**Wyniki.** Występowanie zaburzeń postawy ciała wykryto u 77% osób przebadanych. Największy odsetek wad postawy obserwuje się u dzieci 6 i 7-letnich.

### Abstract

**Introduction.** In recent years in Poland the number of children and adolescents afflicted with faulty posture has highly increased. This is mostly caused by poor life-style and bad motor habits. These factors evoke a chain reaction in the human body which leads to consolidation of various defects and this may result in the development of discopathy and many other health problems. Too late diagnosis of faulty posture or disregard of minor posture abnormalities contribute to the increase of faulty posture occurrence. Early detection of abnormalities and correct rehabilitation can break the pathological cause-and-effect process.

**Aim.** The aim of the study was to assess the frequency of faulty posture in different body planes and the contracture of the hamstring muscles among school-age children in the region of Zielona Góra.

**Material and methods.** The study encompassed primary school children in the city of Zielona Góra and the region. Altogether 7,781 persons (3,890 girls and 3,891 boys) were examined. Every person was subjected to the finger-floor test, the Adams test, the pelvic static test, Bertrand's test and the visual body posture assessment of the frontal, sagittal and transverse planes. The results of the research have been presented in the form of figures and percentage.

**Results.** The study revealed disorders in body posture in 77% of the examined persons. Most faulty posture cases are observed in 6- and 7-year-old children.

**Słowa kluczowe:** wady postawy, postawa ciała, dzieci, młodzież.

**Key words:** faulty posture, body posture, children, adolescents.

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## INTRODUCTION

In Poland faulty posture concerns 70% children at school age. In the city of Zielona Góra 77% children have incorrect posture whereas in Łódź it amounts to 71.8% and in the region of Warszawa the numbers reach 90% and the situation is worsening every year [1].

Poor lifestyle and bad motor habits are classified as the most common factors affecting the formation of faulty postures. An increased number of amount faulty postures may be attributed mainly to very fast development of modern civilization, which is connected with the transformation in child's environment [2,3]. A lifestyle of children has been changing in recent times; it begins to be less active because of the model of spending free time (computer, television). Threats appear with special intensification in the so-called critical periods, which is at the beginning of school and during rapid growth period [4,5].

Other reasons causing such a big number of faulty postures are: poor level of diagnosis, prevention and correction of faulty postures in school, family and even in health care institutions, which leads to late detection of abnormalities in body postures. Procedures refunded by the Polish NFZ [National Health Service] show complete lack of offers in the field of prevention, diagnostics and treatment of faulty postures.

## AIM

The aim of the study was to assess the frequency of faulty posture in different body planes and the contracture of the hamstring muscles among children at school age in the region of Zielona Góra.

**TABLE 1. Numerical data of children in every age group .**

Age	Years								
	6	7	8	9	10	11	12	13	14
The number of tested people	43	1,010	1,086	1,113	1,066	1,105	1,140	1,171	42

## MATERIAL AND METHODS

The study was conducted from January 2009 to June 2009. It encompassed 7,781 children from 6 to 12 years old. The proportion of children in every age group is shown in Table 1.

Children and adolescents afflicted with neurological diseases and with physical or mental disability were excluded from the study.

The population involved in the study lived in the city of Zielona Góra and the region. It is situated in the Lubuskie Province in the west part of Poland. Zielona Góra Commune consists of 17 countries. The region of Zielona Góra is the area of average economic situation. Every person was subjected to the visual body posture assessment of the frontal, sagittal and transverse planes and to four diagnostic tests. The first was the finger-floor test, which tests contracture of the hamstring muscles. The next was the Adams test, which helps to detect asymmetry of the spine in the frontal and transverse planes on the basis of occurring rib kyphosis in the thoracic part of the spine or lumbar "shaft" in the lumbar part of the spine [6]. The next test was the pelvic static test, which detects asymmetry of the pelvis. And the last – Bertrand's test, which reveals asymmetry in the frontal and transverse planes. The occurrence of abnormalities in particular planes was recognized as a positive result. A negative result means that related planes do not show any abnormalities. The results obtained from tests were put to an individual result card and then all the results were grouped and analyzed (Table 2).

## RESULTS AND DISCUSSION

### The group of six-year-old children

The analysis of the study revealed that in this group 21 persons had faults in the frontal plane, which constitutes 48.8% of the whole group, 37 persons had faults in the sagittal plane, which makes 86% of the group, 21 persons had faults in the transverse plane, which constitutes 48.8% of the group, 38 persons had asymmetry of the pelvis, which constitutes 88.3% of the whole group and 40 children had deficiency in the hamstring muscle length, which makes 93% of the whole group.

**TABLE 2. Frequency of faulty postures in school children in city of Zielona Góra and the region in 2009 year.**

Year-book	Number of tested people	Faults in the frontal plane		Faults in the sagittal plane		Faults in the transverse plane		Asymmetry of the pelvis		Efficiency in the hamstring muscle length	
		%	N	%	N	%	N	%	N	%	N
1995	42	33.4%	14	78.6%	33	33.4%	14	54.8%	23	64.3%	27
1996	1,171	34%	398	74.2%	869	34%	398	73.6%	862	74.2%	869
1997	1,140	33.9%	387	76.4%	872	33.9%	387	73.9%	843	76.9%	877
1998	1,105	32.2%	356	76.4%	845	32.2%	356	73%	807	74.6%	825
1999	1,066	32.1%	343	73.5%	784	32.1%	343	73%	779	77.1%	822
2000	1,113	32.7%	365	75%	835	32.7%	365	74.7%	832	77.4%	862
2001	1,086	35.3%	384	74.2%	806	35.3%	384	73.2%	796	74.7%	812
2002	1,010	36.5%	396	74.7%	755	36.5%	396	83.7%	846	86.6%	875
2003	43	48.8%	21	86%	37	48.8%	21	88.3%	38	93%	40
Suma całkowita	7,781	35.24%	2,664	77.20%	5836	35.24%	2664	77.06%	5,826	79.48%	6,009

### The group of seven-year-old children

In the group of seven-year-olds, the analysis revealed that in this group 396 persons had faults in the frontal plane, which constitutes 36.5% of the whole group, 755 persons had faults in the sagittal plane, which makes 74.7% of the group, 396 persons had faults in the transverse plane, which constitutes 36.5% of all group, 846 persons had asymmetry of the pelvis, which constitutes 83.7% of the group and 875 children had deficiency in the hamstring muscle length, which makes 86.6% of the whole group.

### The group of eight-year-old children

In the group of eight-year-olds, 384 persons had faults in the frontal plane, which constitutes 35.3% of the whole group, 806 persons had faults in the sagittal plane, which makes 74.2% of the group, 384 persons had faults in the transverse plane, which constitutes 35.3% of the group, 796 persons had asymmetry of the pelvis, which constitutes 73.2% of patients and 812 children had deficiency in the hamstring muscle length, which makes 74.7% of the whole group.

### The group of nine-year-old children

The analysis revealed that in this group 365 persons had faults in the frontal plane, which constitutes 32.7% of the whole group, 835 persons had faults in the sagittal plane, which makes 75% of the group, 365 persons had faults in the transverse plane, which constitutes 32.7% of the group, 832 persons had asymmetry of the pelvis, which constitutes 74.7% of the group and 862 children had deficiency in the hamstring muscle length, which is 77.4% of the whole group.

### The group of ten-year-old children

In the group of ten-year-olds, 343 persons had faults in the frontal plane, which constitutes 32.1% of the whole group, 784 persons had faults in the sagittal plane, which makes 73.5% of the group, 343 persons had faults in the transverse plane, which constitutes 32.1% of the group, 779 persons had asymmetry of the pelvis, which constitutes 73% of the group and 822 children had deficiency in the muscle length of the hamstrings, which makes 77.1% of the whole group.

### The group of eleven-year-old children

The analysis revealed that in this group, 356 persons had faults in the frontal plane, which constitutes 32.2% of the whole group, 845 persons had faults in the sagittal plane, which makes 76.4% of the group, 356 persons had faults in the transverse plane, which constitutes 32.2% of the group, 807 persons had asymmetry of the pelvis, which constitutes 73% of the whole group and 825 children had deficiency in the hamstring muscle length, which makes 74.6% of the group.

### The group of twelve-year-old children

The analysis revealed that in this group, 387 persons had faults in the frontal plane, which constitutes 33.9% of the group, 872 persons had faults in the sagittal plane, which makes 76.4% of the group, 387 persons had faults in the transverse plane, which constitutes 33.9% of the group, 843 persons had asymmetry of the pelvis, which constitutes 73.9% of the group and 877 children had deficiency in the hamstring muscle length, which makes 76.9% of the whole group.

### The group of thirteen-year-old children

In the group of thirteen-year-olds, 398 persons had faults in the frontal plane, which constitutes 34% of the whole group, 869 persons had faults in the sagittal plane, which makes 74.2% of the group, 398 persons had faults in the transverse plane, which constitutes 34% of the group, 862 persons had asymmetry of the pelvis, which constitutes 73.6% of the whole group and 869 children had deficiency in the hamstring muscle length, which makes 74.2% of the group.

### The group of fourteen-year-old children

The analysis revealed that in this group, 14 persons had faults in the frontal plane, which constitutes 33.4% of the whole group, 33 persons had faults in the sagittal plane, which makes 78.6% of the group, 14 persons had faults in the transverse plane, which constitutes 33.4% of the group, 23 persons had asymmetry of the pelvis, which constitutes 54.8% of the group and 27 children had deficiency in the hamstring muscle length, which makes 64.3% of the whole group.

The group of six-year-old children obtained the biggest percentage of faulty postures and the biggest percent of hamstring muscle deficiency in comparison with other age groups. The results in this group were higher than in the group of children with the smallest percentage of faults in the frontal and transverse plane at the rate of 15.4%. However, the percentage of faults in the sagittal plane in the group of six-year-old children differed from the percentage in the group of children with the smallest percentage of faults in the sagittal plane at the rate of 12.5%. In case of pelvic static disorders, the group of six-year-old children also had the highest percentage and differed from the group with the best results at the rate of 33.5%. Deficiency of the hamstring muscle length was stated in almost every six-year-old child – 93% - and the percentage was different at the rate of 28.7% from the group of children with the smallest number of contractures.

The division has also been made with regard to the intensity of faulty postures and the results have been put to Figure 1. It appears that most tested people had 4 different faults, which makes 31.30% of all of the tested children and only 8.9% people had one fault. Only 4% of the children had correct posture, symmetric pelvis and proper length of hamstring muscles.

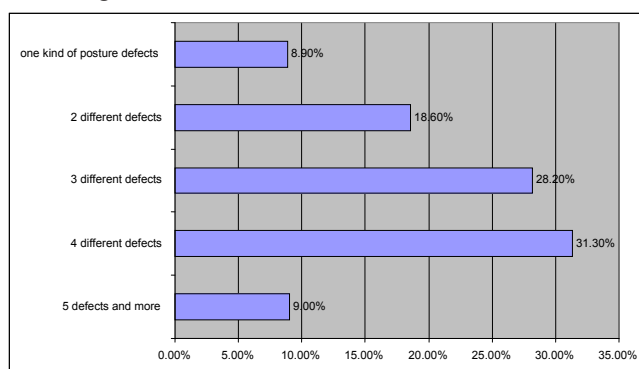


FIGURE 1. Intensity of occurrence of posture defects among children at school age in the Zielona Góra and the region in 2009.

The growing number of children with faulty postures every year forces us to consider prevention and treatment of faulty postures more seriously. This poses a grave social problem and in Poland – also economic one. When body posture disorders are left untreated, morphological changes can develop in the following years and this will have big impact on the health condition of children and may cause absence at work or even lead to disabilities in their mature life [7]. Despite the fact of applying prophylactic and corrective gymnastics, the problem of faulty postures is not diminishing – it seems to have been growing bigger in recent years and, what is equally important, it starts at an earlier age [1].

During the last century, many methods of corrective treatment have been elaborated and introduced. Unfortunately, a truly effective method of correcting faulty posture hasn't been devised yet. At this point it is worth exposing that the aim of corrective treatment should not be to obtain one local result but to maintain the corrected posture permanently. [2,5]. Therefore, it is necessary to see the problem of occurrence of faulty posture in a wider perspective and also to change our attitude towards prevention, diagnostics and treatment. In order to know the causes of this "epidemics" of faulty posture, the children from the region of Zielona Góra were tested with highly specialist equipment for the examination of the central postural system – this will be presented in detail in the next article [3].

## CONCLUSIONS

1. In the region of Zielona Góra a posture fault in at least one plane was found in 77% of school age children.
2. The highest percentage of faults in body posture was observed in the sagittal plane (77%) and the lowest number of fault was stated in the frontal and transversal planes (35.4%).
3. The asymmetry of the pelvis was observed in 77.2% cases.
4. Efficiency in the hamstring muscle length was revealed in 79.4% cases.
5. The examination indicates that a bigger number of children with faulty posture is among younger children.
6. The biggest percentage of faulty postures is observed in 6- and 7-year-old children.
7. Only 4% of the school age children did not have any body posture, hamstring muscle length or pelvic static disorders.

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