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Socioeconomic disparities in children's posture defects: a comparison between private and public educational institutions

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Abstract

The topic of risk factors for posture pathology in Polish children is relevant at present, as it is insufficiently studied and reflects the need to investigate the relationship between family socioeconomic status and the occurrence of posture defects, to develop relevant prevention and treatment strategies in the context of current socioeconomic conditions in Poland. The research aims to study posture defects in children depending on their socioeconomic status in the example of private and public schools. A comparison of the prevalence of deformities and posture disorders of

participants in private and public educational institutions from 2017 to 2020 is presented. Theoretical research methods (literature analysis, generalisation); empirical methods (study of other researchers' experience), statistical analysis, and graphical presentation of data were used. More than 1300 Polish schoolchildren from private and public schools took part in this cross-sectional study. The most common problems were flat feet (54.73%), calf muscle contracture (44.30%), and valgus deformity (21.22%). The least common problems were funnel chest (0.37%), cavus foot (0.10%), and hammer toe deformity (0.04%). The general trend shows that problems with flat feet and calf muscle contracture were more common among participants in both types of educational institutions. There was a general trend of increasing the number of nosological forms per patient in both private and public institutions over a period of three years. Private institutions had significantly fewer cases of one patient having more than one nosological form as compared to public institutions.

Introduction

Posture, the manner in which an individual maintains an upright position, is influenced by various factors such as overall health, age, lifestyle, and well-being. Additionally, genetic predispositions, organ structure, and external elements contribute to one's posture. As the body develops, it adapts to its surroundings, including the control of posture, which can be influenced by habitual behaviours, including reflex actions. Developing proper posture habits early on is crucial, as maintaining poor posture can worsen existing deficiencies. Therefore, it is essential for both children and adults to cultivate correct posture habits. Ensuring a healthy body structure is key to preventing posture-related issues, with factors such as limb shape, spine condition, and the strength of supporting muscles playing significant roles.[1-4]

Musculoskeletal disorders are becoming increasingly common, especially in children. In the future, this problem may occur in adults. Modern lifestyles do not encourage physical activity in young

people, which affects posture patterns. Schools play a significant role in shaping a child's worldview, yet this influence can sometimes result in distortions and unhealthy habits. Unfortunately, parents may not consistently prioritize monitoring changes in their children's musculoskeletal systems. Consequently, there is a vital need for both parents and schools to take preventive measures and assume responsibility for fostering proper posture among children and adolescents. This joint effort is crucial for ensuring the long-term health and well-being of young individuals as they develop.[5]

Latalski *et al.* analysed risk factors for the development of posture defects in school-aged children from Poland and the Czech Republic.[6] A correlation between the child's physical activity and the occurrence of posture defects was found. Children who spend more time in active physical activities are less likely to develop posture defects. Children from families with higher economic status were more likely to be aware of posture defects and to have undergone appropriate screening. Therefore, researchers recommend the creation of an education system for parents and children aimed at preventing posture defects and informing them about the associated risks.

The rationale for investigating the relationship between socioeconomic status and posture defects in children stems from the known influence of socioeconomic factors on various aspects of health and well-being, including musculoskeletal health. Studies have highlighted the significant impact of socioeconomic status on health outcomes across different populations. Research has consistently shown that children from lower socioeconomic backgrounds are more likely to experience adverse health outcomes, including higher rates of obesity, chronic diseases, and developmental issues. These disparities often extend to musculoskeletal health, where children from disadvantaged backgrounds may face increased risk factors for posture defects due to limited access to healthcare, inadequate nutrition, and environmental factors. For instance, a study by Muchacka and Pyclik[5] found that children from lower socioeconomic backgrounds were more likely to have poor posture and musculoskeletal issues compared to their counterparts from higher socioeconomic backgrounds. Similarly, research by Cichewicz *et al*.[7] demonstrated a correlation between socioeconomic status and the prevalence of spinal deformities in school-aged children.

Given these findings, investigating the relationship between socioeconomic status and posture defects in children is crucial for understanding and addressing health disparities within the pediatric population. By identifying the specific socioeconomic factors that contribute to posture defects, interventions, and policies can be developed to mitigate these disparities and promote musculoskeletal health equity among children from diverse socioeconomic backgrounds. Therefore, this research question is essential for informing public health initiatives aimed at improving the overall well-being of children and reducing health inequalities.

It has been previously shown that general health status depends on several factors, including socioeconomic status, and in the context of Poland including the type of employment and access to modern infrastructure.[8-11] Yang and Kayaardi,[12] and Rój and Jankowiak[13] also determined that social inequality in the Polish population not only affects health but also limits access to e-health technologies, which may provide a basis for improving public policy in this area. Thus, evidence on the impact of various factors on the development of posture pathology has been accumulating, but in the context of Polish schools, such evidence is limited and requires further research.

The research aims to examine how the socio-economic status of families influences the prevalence of posture defects in children, using private and public schools as case studies.

The objectives of the study were to reveal the following points: i) to develop and evaluate a wellness program for children in both private and public schools to promote healthy posture and prevent postural defects, including physical activity, nutrition education, access to medical care, and awareness campaigns; ii) to investigate the differences in access to health care and nutrition between children from low and high socioeconomic status in both types of schools, assessing their impact on the prevalence of postural defects; iii) to evaluate the effectiveness of educational campaigns for parents on the importance of good posture for children's health.

The study provides novel insights into musculoskeletal health among Polish schoolchildren by analysing data from three academic years (2017-2020) in private and public educational institutions. It explores how different educational settings influence the prevalence of various deformities and

posture disorders, highlighting disparities between private and public schools. Additionally, the analysis of the average number of conditions per patient offers a nuanced understanding of musculoskeletal burdens within each setting.

Materials and Methods

The study utilized a cross-sectional approach to gather data at a single point in time. Theoretical research methods involved reviewing scientific literature and previous studies on the association between family socioeconomic status and children's health, particularly regarding postural defects. Empirical methods included examining the findings of other researchers and designing the data collection methodology, which involved selecting a representative sample of children from private and public schools across various socioeconomic backgrounds. The posture status of children from both types of schools was assessed using medical diagnostic methods, and the collected data were analysed to identify any relationships between family socioeconomic status and posture defects in children. The results were interpreted to determine if there is indeed a correlation between family socioeconomic status and posture defects among children attending different types of schools. Finally, recommendations were formulated for educational and healthcare organizations to enhance children's health and prevent posture defects.

Standard methods of measurement were used to collect anthropometric data. Posture assessment was performed by a specialist with experience in the field who applied an assessment scale. Children in the 1st grade (age 6-8 years) of primary schools in Szczecin, Poland, participated in the study. The study was conducted over the period from 2017-2020. From private educational institutions, 1295 people participated, while from public educational institutions, 65 children were involved. A total of 1360 people participated in the study, among whom there was no differentiation by gender or other parameters except for the type of educational institution (private or public). Mean values and percentages were used for descriptive analyses (Table 1).

Informed consent was obtained from the parents or guardians of all study participants. Participants' data was anonymised and processed following privacy protection requirements. The study was conducted following ethical standards set by national and international organisations.

The use of visual posture assessment may be subject to subjective perception and judgment by the practitioner. Data were obtained only from children of a certain age range and from certain regions, which may limit the generalisation of results to other groups. Other factors not considered in this study may also influence the occurrence of postural defects in children.

Results

As noted earlier, 1,295 people participated from private educational institutions during 2017-2018, while 65 children were involved from public educational institutions. These figures reflect the total number of participants and provide a basis for further analysis and comparison of data on various deformities and posture disorders in both types of educational institutions. When analysing the data obtained for 2017-2018, one significant finding is that hyperkyphosis, characterized by the backward curvature of the spine, was observed in 6.69% of participants in private educational institutions. Additionally, it was found in 9.38% of participants in public educational institutions. This indicates a problem in both types of students, but the prevalence of this deformity is higher among public school students. Flat back syndrome, or flattening of the natural curves of the spine, occurs in 4.59% of private education participants and only 1.56% of public education participants. Hyperlordosis, or forward curvature of the spine, occurs in nearly 7.9% of private education participants and 31.25% of public education participants.

Additional socioeconomic factors, such as family income, parental education, and living arrangements, may play a significant role in understanding the correlation between types of deformities and postural disorders and educational settings. Children from lower-income families may have limited access to health care and physical rehabilitation programs, which can lead to delays

in the diagnosis and treatment of postural deformities. Parental education can also influence the level of awareness of healthy lifestyles and the importance of good posture, which can affect children's health and behaviour. Living conditions, such as access to healthy foods and opportunities for exercise, can also influence the development of postural deformities among children.

A more detailed study of these socioeconomic factors could help to establish the relationship between them and identify specific factors that contribute to the development of postural deformities among children in different types of educational settings. For example, the study could investigate whether there is a link between family income and access to healthcare services for the detection and treatment of postural deformities. It could also examine how parents' education affects their attitudes toward healthy lifestyles and attention to their child's postural problems. A detailed study of living conditions can include an analysis of access to sports grounds, opportunities for sports, and the level of availability of healthy food in different neighborhoods.[14]

Continuing to analyse the remaining deformities and posture disorders, it can be determined that, in general, such pathology was more frequent in 2017-2018 in the subjects from public educational institutions. In Table 2 it is possible to highlight and compare the proportions relative to the total number of participants for each of these in both types of educational institutions. This analysis helps to identify which deformities and posture disorders are more common among students from private and public educational institutions.

Continuing the analysis of the remaining deformities and posture disorders, it can be determined that, in general, such pathology in 2017-2018 was more frequent in the subjects from public educational institutions. It is possible to highlight and compare the proportions relative to the total number of participants for each of them in both types of educational institutions. This analysis helps to determine which deformities and posture disorders are more common among students from private and public educational institutions.

Table 3 presents comparative data on the prevalence of various deformities and posture disorders among participants in private and public educational institutions in the 2018-2019 academic year.

This table presents data on 1360 participants in private educational institutions and more than 100 participants in public educational institutions, as well as the prevalence of various deformities and posture disorders as a percentage of the total number of participants in each category of educational institutions. Some observations on the prevalence of deformities and posture disorders reveal that hyperkyphosis was almost 2% more common in private educational institutions than in public educational institutions. In the latter, its prevalence was more than 5%.

Between 2019 and 2020, trends in the prevalence of deformities and posture disorders were observed among participants in private and public educational institutions. Some deformities, such as hyperkyphosis and flat back syndrome, were found in both types of institutions. However, their prevalence was slightly higher among participants in private institutions. In other cases, such as hyperlordosis, scoliosis, and muscle contractures, the prevalence of these conditions was slightly higher among participants in public institutions. Flat feet were most common among participants in both types of institutions, but their prevalence was slightly higher among participants in private institutions. The overall trend indicates that there are differences in the prevalence of deformities and posture disorders between private and public educational institutions, although some conditions may be more prevalent in one of these categories. Details are shown in Table 4.

Table 4 provides information about the study participants who participated in the period from 2017 to 2020 in private and public educational institutions. It includes the total number of participants with different types of pathologies and the percentage of participants without pathologies in each category of institution.

The table compares the number of participants with different pathologies in private and public schools. It also shows the percentage of participants with pathologies in relation to the total number of participants in each type of institution. For example, in private schools, 89.76% of participants have pathologies, while in public schools, 89.01% have pathologies. The table also shows the number of participants without pathologies: 10.24% in private facilities and 10.99% in public facilities.

Using this table, we can compare the distribution of pathologies in private and public schools and understand general trends in the distribution of these pathologies. The general trend also shows that in private institutions the average number of nosological forms per patient is usually lower than in public institutions. Details are given in Table 5.

Additional factors, such as urbanization and gender, may also influence the occurrence of postural defects in children. Urbanized areas may have higher levels of air pollutants and limited access to open spaces for physical activity, which can lead to an increased risk of developing postural defects. Gender can also influence the types and progression of postural defects, given different physiological characteristics and activities. For example, some research suggests that boys may be more susceptible to certain types of postural defects than girls.

Potential complicating factors such as children's physical activity levels should also be considered. Insufficient physical activity can lead to muscle weakness and underdevelopment of stability, which can contribute to the development of postural defects. Nutrition can also influence children's bone and muscle health, which can play a role in the development of good posture. Access to health care can also be an important factor, as timely detection and treatment of postural defects can prevent their progression and avoid serious complications in the future.

The socioeconomic status of the family is another important factor that can influence the appearance of children's posture. Low-income families may have limited access to health care services and physical rehabilitation programs, which can contribute to delays in the diagnosis and treatment of postural defects. Parental education levels can also influence awareness of healthy lifestyles and the importance of good posture, which can affect children's health and behaviour. Living conditions, such as access to healthy food and opportunities for physical activity, can also influence the development of postural defects among children.

Thus, the general trend indicates differences in the prevalence of various deformities and posture disorders between private and public educational institutions, although some conditions may be more prevalent in one of these categories.

Discussion

The research showed comparative data on musculoskeletal disorders in public and private school students. Similar results have been obtained in other studies and other areas of medicine. As such, Khalid *et al*. investigated the relationship between socioeconomic status and oral health indicators in private and public school students in Karachi, Pakistan.[15] The study found that children from private and government schools had similar mean DMFT (number of impacted, extracted, and filled teeth) but there were significant differences in other oral hygiene indicators such as dental plaque, dental stains, and gingival bleeding/gingivitis. The article highlights the need for increased awareness and public funding to improve the oral health of children from less affluent families and recommends the introduction of practically oriented programs to improve the oral hygiene of public school students.

Groeneveld *et al*. attempted to estimate the prevalence of stunting, underweight, overweight, and obesity among 8-10-year-old children in Quetzaltenango, Guatemala, considering socioeconomic status.[16] Height and weight measurements were taken in 583 private and public-school students. The researchers determined that average height, weight, and body mass index were higher in children with high socioeconomic status. Stunting and underweight are more common in low-status children, while overweight and obesity are more common in high-status children.

The current study did not consider the urbanisation factor and did not include adult subjects. Vavken and Dorotka previously investigated the burden of musculoskeletal diseases and their determination concerning urbanisation, socioeconomic status, age, and gender.[17] The study involved more than 14,500 participants in the European Health Interview Survey conducted in Austria in 2006-2007. The aim was to estimate the prevalence of osteoarthritis, spinal disorders, and osteoporosis in a population representative of other European Union or Organisation for Economic Co-operation and Development countries. Urbanisation, socioeconomic status, age, and gender were considered determinants of musculoskeletal diseases. The results of the study showed that the prevalence of arthritis was 18.8%, spinal disorders 38.4%, and osteoporosis 6.6%. Census data showed a significant

effect of urbanisation on the prevalence of arthritis and osteoporosis but not on spinal diseases. Arthritis and spinal diseases were associated with socioeconomic status, while osteoporosis was associated with age, income, and education.[18,19] When arthritis was analysed, it was found that the impact of urbanisation was significantly reduced after accounting for socioeconomic status.[20] The findings of the study indicated that the burden of musculoskeletal diseases depends on both urbanisation and socioeconomic status. However, the effect of urbanisation is probably due to differences in socioeconomic status and demographics between geographical regions.

The research also did not segregate students by gender. Previously, Carrilero *et al.* conducted a study on socioeconomic and gender inequalities in child health in Catalonia.[21] The study covered 1,449,816 children under 15 years of age between 2014 and 2017. Data on 29 different diseases were analysed and their association with socioeconomic status and gender was assessed. The results showed that 25 of the 29 diseases examined had an association with socioeconomic inequality. Some diseases such as tuberculosis, obesity, anxiety disorders, arterial hypertension, poisoning, as well as preterm labour, low birth weight, and fetal growth retardation were particularly sensitive to socioeconomic status. It was also observed that girls had higher Relative Inequality Index (RII) values for several diseases including respiratory allergies, asthma, dermatitis, overweight, and obesity, while boys had higher RII values only for congenital anomalies.[22] The findings of the study emphasise the need for action to reduce socioeconomic and gender inequalities in child health. They point to the importance of ensuring more equitable health conditions for all children and emphasise the need for targeted interventions to improve the health of children from different socioeconomic groups.

The research illustrated the rather high incidence of musculoskeletal disorders. Azabagic *et al.* analysed the problem of musculoskeletal disorders in school-aged children and touched not only on socioeconomic factors.[23] The study was conducted on 1315 pupils aged 8 to 12 years. The main factor influencing the occurrence of musculoskeletal pain was related to poor ergonomics, overloaded backpacks, age-inappropriate furniture, poor posture, sedentary lifestyle and lack of physical activity. The study found that the weight of school backpacks, the way they are worn, time spent sitting both

at school and at home, and Body Mass Index (BMI) are factors influencing the development of musculoskeletal pain in children.[24] The study concluded that the prevalence of musculoskeletal pain in school-aged children is quite high, and it is necessary to pay attention to ergonomic conditions to prevent its occurrence.[25]

The research also did not investigate the causes of musculoskeletal disorders and frequency of doctor visits. A study by Mbuya-Bienge *et al*. investigated the impact of socioeconomic status on the frequent use of health services among people with multiple health conditions in a public health system in Quebec, Canada.[26] Frequent users of health services (5.1% of the population) accounted for 25.2% of all visits. Socioeconomic status influences the association between multiple diseases and frequent visits to specialists. Inequalities between socioeconomic groups increase as a function of the number of chronic conditions for specialist visits but not for Emergency Room (ER) or general practitioner visits.

In general, a link between socioeconomic level and health has been observed worldwide.[27-29] Thus, an article by Rebouças *et al*. examined social inequalities and their impact on child health from a global and topical perspective.[27] The authors point out the historical and structural roots of this problem in different societies. For this purpose, they investigated relevant articles in the PubMed/MEDLINE database, conducted manual searches, and examined bibliographic references of selected studies as well as data and documents from international organisations. Data analysis showed that to understand how inequalities affect health, it is necessary to consider the unequal distribution of social determinants among population groups. In the case of children, the pathway determined by their parents is crucial. Inequitable lifestyles of many families or social groups due to social and economic inequalities lead to unequal health outcomes, especially for children. This is observed both between and within countries. Children from the most vulnerable groups are more likely to experience the worst health conditions. Interventions targeting children's health must therefore go beyond health care and impact holistically on poverty, and social and economic inequalities to address systematic

and inequitable disparities.[30,31] The authors conclude by pointing out that despite significant advances in child health in recent decades, inequalities, measured by various indicators, continue to exist. Thus, more and more information is being accumulated on the level of health concerning the socio-economic status of the family.

Conclusions

This study investigated the occurrence of postural defects in children depending on the socioeconomic status of the family. Although earlier studies have shown that the type of educational institution and, consequently, the socioeconomic status of the family may be associated with the formation of musculoskeletal pathology in children, this study did not find a statistically significant association between the type of educational institution and postural defects. Nevertheless, the occurrence of such defects may be associated with limited access to quality medical care, improper nutrition, lack of physical activity and other factors that negatively affect the formation of the musculoskeletal system. Public school students showed a higher occurrence of certain conditions, such as hyperlordosis, while private school students exhibited higher rates of others, like hyperkyphosis. Urbanization, gender, physical activity levels, nutrition, and access to healthcare are additional factors that could influence the occurrence of postural defects in children. Understanding these complexities is crucial for designing targeted interventions to address postural health disparities and promote overall well-being among school-aged children. Flat feet, calf muscle contracture and valgus deformity are the most common problems among students regardless of the type of educational institution. These results underscore the importance of preventive measures and wellness programmes to maintain healthy posture in children and adolescents in both types of educational institutions.

There is a requirement for social and economic interventions to enhance the circumstances of low-income households. Implementing support initiatives, social welfare programs, and ensuring access to healthcare can mitigate the adverse effects linked with postural defects in children. Additionally,

enhancing educational outreach and informational campaigns targeted at increasing parental understanding regarding the significance of maintaining proper posture and its implications for children's well-being is essential. Encouraging physical activity, adopting healthy lifestyles, and fostering correct body posture can contribute to diminishing the prevalence of postural defects within the community.

Further research on this topic should delve into the mechanisms by which family socioeconomic status influences posture formation in children. This will make it possible to develop more effective strategies for the prevention and treatment of posture defects, based on an understanding of the root causes of the problem. Overall, this study highlights the importance of paying attention to the socioeconomic context when studying child health and supports the need for action to reduce health and social inequalities and improve the quality of life of low-income families.

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Table 1. Nosological forms and corresponding postural defects.

Nosological Forms	
Hyperkyphosis	Strephenopodia
Flat back syndrome	Cavus foot
Hyperlordosis	Hallux limitus/rigidus
Kypholordotic posture	Hammer toe deformity
Scoliosis	Hyperextension of the knee joints
Funnel chest	Hyperextension of the elbow joints
Pectus excavatum	Calf muscle contracture
Valgus deformity	Hamstring contracture
Flat feet	Sternocleidomastoid muscle contracture
Planovalgus deformity	Shoulder asymmetry

Table 2. Comparison of the prevalence of deformities and posture disorders of participants in private and public educational institutions (2017-2018).

	Private educational institutions (abs)	**State educational institutions (abs)**	**Private educational institutions**	**State educational institutions**
Hyperkyphosis	83	6	6.69%	9.38%
Flat back syndrome	57	1	4.59%	1.56%
Hyperlordosis	98	20	7.90%	31.25%
Kypholordotic posture	17	3	1.37%	4.69%
Scoliosis	168	18	13.54%	28.13%
Funnel-shaped rib cage	27	3	2.18%	4.69%
A keel-shaped rib cage	13	0	1.05%	0%
Vargus deformity	262	29	21.11%	45.31%
Vargus deformity	8	1	0.64%	1.56%
Flat feet	448	9	36.1%	14.06%
Flatfoot	539	43	43.43%	67.19%
Varus foot	5	0	0.4%	0%
Hollow foot	4	0	0.32%	0%
Rigid big toe	55	19	4.43%	29.69%
Hammertoe deformity of the toes	2	0	0.16%	0%
Hyperextension of the knee joints	75	13	6.04%	20.31%
Hyperextension of the elbow joints	18	0	1.45%	0%
Contracture of the calf muscle	555	37	44.72%	57.81%
Contracture of the sciatic-ankle muscles	614	32	49.48%	50%

Sternoclavicular-axillary contracture	75	2	6.04%	3.13%
Shoulder asymmetry	374	24	30.14%	37.5%
Shoulder asymmetry	54	1	4.17%	1.54%
Participants with the pathology in question	1241	64	95.83%	98.46%
Total number of participants	1295	65	–	–

Source: compiled by the authors

Table 3. Comparison of the prevalence of deformities and posture disorders of participants in private and public educational institutions (2018-2019).

	Private educational institutions (abs)	**State educational institutions (abs)**	**Private educational institutions**	**State educational institutions**
Hyperkyphosis	137	6	7.25%	5.41%
Flat back syndrome	54	1	2.86%	0.9%
Hyperlordosis	150	8	7.94%	7.21%
Kypholordotic posture	30	4	1.59%	3.6%
Scoliosis	254	14	13.44%	12.61%
Funnel-shaped rib cage	37	3	1.96%	2.70%
Keel-shaped rib cage	3	0	0.16%	0%
Valgus deformity	449	30	23.76%	27.03%
Valgus deformity	11	0	0.58%	0%
Flat feet	1149	56	60.79%	50.45%
Planovalgus deformity	338	18	17.88%	16.22%
Strephenopodia	3	1	0.16%	0.9%
Cavus foot	0	0	0%	0%
Rigid big toe	0	2	0%	1.8%
Hammer toe deformity	0	0	0%	0%
Hyperextension	234	22	12.38%	19.82%
Calf muscle contracture	691	28	36.56%	25.23%
Shoulder asymmetry	471	31	24.92%	27.93%
Participants without the pathology in question	197	6	9.44%	5.13%
Participants with the pathology in question	1890	111	90.56%	94.87%
Total number of participants	2087	117		

Source: compiled by the authors

Table 4. Comparison of the prevalence of deformities and posture disorders of participants in private and public educational institutions (2019-2020).

	Private educational institutions (abs)	**State educational institutions (abs)**	**Private educational institutions**	**State educational institutions**
Hyperkyphosis	221	24	12.36%	10.43%
Flat back syndrome	30	8	1.68%	3.48%
Hyperlordosis	62	11	3.47%	4.78%
Kypholordotic posture	25	7	1.40%	3.04%
Scoliosis	123	8	6.88%	3.48%
Funnel-shaped rib cage	38	7	2.13%	3.04%
Keel-shaped rib cage	2	0	0.11%	0%
Valgus deformity	333	32	18.62%	13.91%
Valgus deformity	6	5	0.34%	2.17%
Flat feet	1095	112	61.24%	48.7%
Planovalgus deformity	244	57	13.65%	24.78%
Strephenopodia	1	0	0.06%	0%
Cavus foot	1	0	0.06%	0%
Rigid big toe	0	0	0%	0%
Hammer toe deformity	0	0	0%	0%
Hyperextension	102	7	5.7%	3.04%
Calf muscle contracture	933	89	52.18%	38.7%
Sciatic-ankle muscle contracture	721	85	40.32%	36.96%
Clavisternomastoid contracture	1	8	0.06%	3.48%
Shoulder asymmetry	135	22	7.55%	9.57%
Participants without the pathology in question	310	43	14.78%	15.75%

Participants with the pathology in question	1788	230	85.22%	84.25%
Total number of participants	2098	273		

Source: compiled by the authors

Table 5. Comparison of the number of nosological forms per patient in private and public educational institutions for the period 2017-2018 to 2019-2020.

	Overall data		**Private educational institutions**		**State educational institutions**	
	Number of nosological forms in 1 patient	**Participant number**	**Number of nosological forms in 1 patient**	**Participant number**	**Number of nosological forms in 1 patient**	**Participant number**
2017-2018	0	57	0	56	0	1
	1	264	1	260	1	4
	2	345	2	335	2	10
	3	317	3	302	3	15
	4	214	4	204	4	10
	5	98	5	86	5	12
	6	43	6	36	6	7
	7	18	7	13	7	5
	8	3	8	2	8	1
	9	1	9	1	9	0
2018-2019	0	203	0	188	0	15
	1	564	1	544	1	20
	2	591	2	561	2	30
	3	431	3	402	3	29
	4	239	4	220	4	19
	5	113	5	109	5	4
	6	51	6	51	6	0
	7	12	7	12	7	0
2019-2020	0	353	0	306	0	47
	1	649	1	562	1	87
	2	631	2	569	2	62
	3	435	3	389	3	46
	4	220	4	195	4	25

	5	45	5	42	5	3
	6	32	6	29	6	3
	7	6	7	6	7	0
Overall data over 3 years	0	613	0	550	0	63
	1	1477	1	1366	1	111
	2	1567	2	1465	2	102
	3	1183	3	1093	3	90
	4	673	4	619	4	54
	5	256	5	237	5	19
	6	126	6	116	6	10
	7	36	7	31	7	5
	8	3	8	2	8	1
	9	1	9	1	9	0

Source: compiled by the authors

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