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ORIGINAL ARTICLE

Prevalence of postural abnormalities in primary girl students

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ABSTRACT

Background: Providing the physical needs of students and their health is one of the most important health issues. According to recent research, there are common anomalies and physical deformities among students. The aim of this study was to evaluate postural abnormalities in primary girl students.

Methods: This was a descriptive cross-sectional study that was conducted on 201 primary girl students who were referred to the movement correction center in Ardabil during 2018-2019. After obtaining consent from the parents of the students, a checklist containing demographic information and evaluation of the postural abnormalities was completed for all students. Collected data were analyzed using the statistical method Statistical Package for the Social Sciences version 24.

Results: The most common anomalies were uneven shoulder (83%) and the least common was flat back (0.5%). Other anomalies were lordosis, kyphosis, genu valgum, pes planus, hallux valgus, forward head posture, genu varum, scoliosis, and flat back, respectively.

Conclusion: In this study, uneven shoulder was the most common anomaly. Due to easier correction of anomalies at a younger age, corrective measures must be taken at this age. Also, by designing an evaluation program, training, and correction, we can provide suitable grounds for the prevention and even treatment of such abnormalities.

Keywords: Postural abnormalities, students, uneven shoulder, Ardabil.

Introduction

Static abnormalities are undesirable changes that disrupt the body's skeletal structure and natural shape of the body [1]. If this deformity is acute, it can lead to dangerous physical complications and if it is mild, it also draws attention as an apparent flaw. Regularity anomalies reduce individuals' self-esteem and affect their long-term social activities, and it is sometimes used as an attribute of a person to identify him/her. All of these can have a detrimental effect on the morale and ultimately life of the individual. Static abnormalities are a common disorder among individuals in our society and medical and sports professionals. The prevalence of physical deformities is common among girls and boys, especially in adolescents. Today, the mobility of children and adolescents has declined alarmingly and they spend most of their leisure time carrying out sedentary activities, such as watching TV or playing computer games, and for this reason they do not have the desired fitness. Also, the level of physical activity of children and adolescents decreases as they reach adulthood [2].

Static abnormalities are one of the consequences of inactivity [3] and identifying it at an early stage can prevent eventual major problems in one's body and life. Since these anomalies are not inherited in most cases, but they are acquired throughout life and due to one's lifestyle, a lifestyle that can be helped to accurately detect the anomaly [1].

There are many factors that contribute to the occurrence of anomalies in various regions. Many of them are rooted in the culture and lifestyle of the people. Habits like sitting on the floor without a backrest, reading and writing without using a standard or writing desk, hunched

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or loose walking plus carrying bags and backpacks, and using non-standard school benches are the most important causes of malformations in adolescents and youth. Of the 40 abnormalities identified, eight malformations are more common in girls and boys, including kyphosis (round back), scoliosis (back tilt), flat waist, lordosis (lumbar spine), parenthesis or O, knee cruciform or X, flat foot, and tilted toe [4]. One of the most important health issues is to provide the physical needs of the students which provide them with health. Investigations show that there are physical changes among students. These deformations are often not severe and can be corrected by simple exercises. If abnormalities are identified in a timely manner in students, correcting and improving postural abnormalities at a younger age will be much easier because of greater flexibility in muscles and joints. So, corrective measures must be taken at this age. The aim of this study was to investigate the anomalies among elementary school students in Ardabil city.

Materials and Methods

This study was a cross-sectional descriptive study that was conducted on 201 female students who were selected randomly from 19 elementary schools in Ardabil city during 2018. After obtaining written consent from parents, students were evaluated clinically for disorders and their data recorded in the checklist. Data on weight, height, body mass index and body condition toward asymmetric shoulder (shoulder drop), lower back, round back, flat back, tilted back, bracket, cross knee, flat foot, and tilted legs were collected. The measuring tool for detecting anomalies was the New York test, mirror box, and flexible ruler. Postural anomalies such as forward head posture (FHP), asymmetric shoulder, hyperkyphosis, hyperlordosis, scoliosis, genu varum, genu valgum, pes planus, flat back, and hallux valgus were evaluated. For measuring forward head, a special goniometer was used. For measuring asymmetric shoulder, a posture screen was used. For hyperlordosis and hyperkyphosis, a flexible ruler was used. For scoliosis, a scoliometer was used. Genu valgum and genu varum were measured by measuring the intermalleolar distance and the intercondylar distance of the femur, respectively, and these distances were measured by the bone caliper. For flat back, a podoscope was used and, finally, for hallux valgus, a goniometer was used. This study was approved by Ardabil University of Medical Sciences Ethics Committee and registered by code IR.ARUMS.REC.1397.075. The collected data were analyzed using the descriptive statistical method Statistical Package for the Social Sciences version 22.

Results

Of the 201 studied students, 132 (66%) were lean, 57 (28%) were normal, and 12 (6%) were overweight and obese. Out of 58 students with FHP, 28 were mild, 25 were moderate, and five were severe. 166 children (83%) had uneven shoulder, of which 85 (51.2%) were of moderate severity. Out of the total number of referred patients, 55 children (27.4%) had genu varum, of which 45.5% were moderate grade. 90 children (44.8%) had abnormality of pes planus, of which 35 patients (39%) were severe. 59 children (29.4%) had abnormality of hallux valgus, of which 22 (37.3%) were severe (Figure 1).

Discussion

This study was carried out on 201 primary girl students with postural abnormalities. Of all students, 66% were lean, 28% were normal, 5% were overweight, and 1% was obese. Hajian et al. [5] in a study reported the prevalence of overweight and obesity to be 12.3% and 5.8% in primary school students, respectively. In another study on 794 students, Golestan et al. [6] reported the prevalence of thin, obese, and overweight students to be 13.9%, 12.9%, and 6.5%, respectively. Krassas et al. [7] reported the prevalence of overweight and obesity in Greek students as 22.2% and 4.1% and in Turkish students as 10.6% and 1.6%, respectively. Zaini et al. [8] estimated the prevalence of overweight and obesity in primary school children in Malaysia aged between 9 and 10 years at 16.3% and 6.3%, respectively. In the study of Manzoli et al. [9], the prevalence of overweight in 6-14-year-old students was 40.6%. In the study of Núñez-Rivas et al. [10], the prevalence of overweight and obesity was 34.5% and 26.2%, respectively. In the study by Sadeghi and Azadinia [11], out of 1,332 Isfahani students, 65% were lean, 29% were normal, and 6% were obese. The results of overweight and obesity in the present study were significantly different from those reported earlier, except for Sadeghi and Azadinia [11], and the percentages of overweight and obesity were lower in the present study. Also, the prevalence of thin students in the study by Hajian et al. [5] was 13.5%, but in the study by Zaini et al. [8] in Malaysia the prevalence of thin students aged 9-10 years was 2.1%. Gür et al. [12] in Turkey reported the prevalence of thin students aged 6-16 years was 4.6% [5]. Agha Molaei et al. [13] reported the prevalence of thin students in Bandar Abbas elementary school as 12.2%. Compared to the present study (66%),

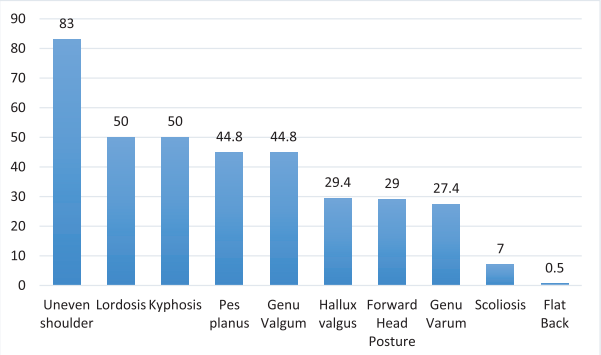

Figure 1. *Frequency of postural abnormalities among students.*

Sadeghi and Azadinia [11] study had a higher rate (65%), which was related to effective factors on the growth and sampling method of age groups in various studies and or differences in social, economic, and nutritional status.

In the present study, out of 166 students, 83% of the children had uneven shoulder problems and it was ranked first among other abnormalities. In other studies, the rate of uneven shoulder ranged from 14.7% to 67.2%, which was lower than the present study [14-18]. The reasons for this are probably the wrong habits of elementary school children in using heavy bags and books and not taking part in proper school sports. Given that the subjects in this study are in the lower age group, the prevalence of this disorder is especially alarming among girls because increasing age and dealing with jobs will increase the severity and rate of abnormalities. In the present study, 58 (29%) students had FHP. Karimian et al. [19] estimated the prevalence of FHP to be 5.4%; Fahimeh and Alireza [20] estimated the prevalence of FHP to be 60.3%; Griegel-Morris [21] estimated the prevalence of FHP to be 66%; and Williams estimated the prevalence of FHP to be 80%. The results of this study were higher than those of Karimian et al. [19] and less than those of other studies. The prevalence of this complication appears to be increasing and this is also due to the excessive use of mobile phones and computers among children, leading to the development of FHP and neck arthritis in the studied community. In the present study, 14 students (7%) had scoliosis. In other studies, the incidence of scoliosis varied from 9.5% to 26.1%, which was higher than the present study [18,19,22,23]. Despite the good condition of Ardabil children in comparison to the other studies, it should be noted that sitting on couches inappropriately as well as daily carrying of bags and books with one hand constantly involved in the formation of scoliosis. Therefore, the teacher and health coach should monitor the growth and development of students and be attentive as they sit while listening to the lesson. In the present study, 101 (50%) students had scoliosis.

In other studies, the rate of kyphosis ranged from 26.3% to 54.1% which is consistent with the present study [19,20,23-25]. The results of this study on kyphosis abnormality had a higher rate than those of Penha et al. [23], Griegel-Morris et al. [21], Seneh et al. [24], and Kim et al. [25], but had a lesser rate than those of Karimian et al. [19]. If this problem is not corrected timely, it can progress over time and cause many complications, such as pain, to the students in the future. It also increases the amount of energy consumed during physical activity, which leads to early exhaustion during exercise. While in the normal physical state, the amount of abnormal forces joining slow breathing and energy consumption is minimized. Also, a good physical condition gives the person a beautiful appearance and enhances one's self-esteem and mobility and creates a sense of satisfaction and joy of life and early and rapid diagnosis and proper follow-up of it prevents the progression of aberrations by reducing the need for difficult surgical and surgical treatments in adulthood.

In the present study, out of the total number of female students, 1 (0.5%) suffered from Flat Back (FB) and 101 (50%) had lordosis. In girls aged 7-10 years, Penh et al. [23] reported a prevalence of back pain of approximately 50% and Karimian et al. [19] reported a prevalence of 77%. The results of this study are in line with that of Penha et al. [23] and in disagreement with that of Karimian et al. [19]. In the present study, out of the total number of female students, 90 (44.8%) had genu valgum. Penha et al. [23] reported that girls aged 7-10 years had a prevalence of genu valgum of about 50%, and Karimian et al. [19] reported a prevalence of about 12.2%.

In the present study, 55 (27.4%) students were affected by genu varum. Voloc et al. [26] showed that 13% of the children aged 11 years had genu varum, which was lower than the present study. Mirzaei et al. [14] also noted that the rate of genu varum between both sexes was similar. The results showed a higher prevalence of these anomalies (43.1%) among these students. The results of the present study are higher than those of Voloc et al. [26] but lower than those of Mirzaei et al. [14]. In the present study, out of all students, 90 (44.8%) had pes planus. Ozonov said in his study that 4% of 10-year-old children suffered from pes planus malformation [17]. Karimian et al. [19] showed a 35.2% of pes planus complication, which was lower than the present study.

In this study, out of all students, 59 (29.4%) had hallux valgus. Mirzaei et al. [14] found that 19.23% of the students had this malformation. Karimian et al. [19] showed a prevalence of about 20.3% for the same. Penha et al. [23] reported a prevalence for hallux valgus of about 50%. Comparison of the results of the above studies showed that the prevalence of hallux valgus in Mirzaei and Karimian's studies was lower than the present study but was higher than Panha et al.'s [23] study rate.

Conclusion

The results of this study showed that uneven shoulder (83%) had the highest prevalence of abnormalities among students. Since the correction of postural anomalies at a younger age is much easier due to greater flexibility in the muscles and joints, corrective measures are necessary at this age. Also, by designing an evaluation, training, and correction program, we can provide appropriate grounds for the prevention and treatment of such abnormalities in the future. It is suggested that a larger study be conducted at other educational levels and on boys at the provincial schools level.

List of Abbreviations

FB Flat Back
FHP Forward Head Posture

Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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Consent to participate
Not Applicable.

Ethical approval
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