

## 2. PERFORMANCE IN SPORTS AND ART. THE BEGINNINGS

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**Abstract:** *The topic we are referring to has been debated on various occasions, but our approach aims on one hand the importance of physical exercises and their impact on a category of students, namely those in higher art education system, and on the other hand brings to attention some age-related changes, namely the succession of forms corresponding to the functional changes in time of our body. The period of evolution within this context corresponds to the growth stage up to 20 years. The growth and development of the musculoskeletal system in length, width and depth alternate according to a specific rhythm that allows periods of division. Thus, there are periods of growth in human life, mainly in terms of width and periods of growth in height, which alternate once at 3 or 4 years.*

*Several chronicles and statistics prove that young people's body with good physical condition has withstood the hardships of life in a much higher ratio than those who are not in fit. We know very well that a harmonious body is a preventative medicine against diseases and a body accustomed to physical exercises gives teenagers an extra dose of protection. According to the American Heart Association, physical inactivity increases the risk of stroke and amplifies other risk factors for cardiovascular disease, such as: obesity, high blood pressure, LDL cholesterol ("bad") and diabetes.*

*This topic is all the more important as it's about student artists who face certain problems related to the development of the human body under the conditions imposed by a profession, many of them being forced to adopt certain body positions for a long time either in front of the easel or with the violin in their hand, or on scaffolding, on mural or restoration sites. In fact, we have raised these issues in other articles and also at some symposium communications. We want to contribute to the training of young artists through the recommendations and programs provided in anatomy and sports culture so that this information is understandable and, at the same time, becomes a decision-maker in psycho-physical and, implicitly, in professional development.*

**Key words:** *physical exercises, age-related changes, the skeletal system, the muscular system, artists*

### 1. Introduction

Regular physical activity is very important for strengthening bones and this activity is recommended since childhood, because in that period the basis of the skeletal system is being made and can be maintained throughout lifetime. Most people reach their highest bone density around or immediately after the age of 20. This happens when their bones reach their highest level of density and strength. This level of density is maintained throughout adulthood, after which decline begins (C. Jerome, B. Hoch, C. Carlson, 2018). The ages, characterized by specific shape changes, represent systematic divisions of a process that has a continuous development, with a period of evolution and another of involution. These two

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periods, with opposite directions (ascending and descending) meet at the end of the fourth decade and the beginning of the fifth. They correspond to a stage of development or growth (up to 20 years), which is the subject of the morphology of development, the stage of maturity, which extends over the next 3 decades, and finally, the stage of old age (T. Vlad, R. Minea).

But recent studies have proved that exercise is just as important as diet when it comes to building healthy and strong bones. Exercise is important in childhood and adolescence, but especially during puberty (G. Tatangelo, et all, 2017).

## **2. Morphological aspects in the physical development of young people**

The growth of the skeleton and the muscular system in length, width and depth alternates according to a rhythm that allows the division of the growth over periods. The morphological aspect will thus be dominated either by length, or by width and depth, each being found in the three epochs of growth: childhood, puberty and adolescence. Changes in the size, proportions and thickness of bones and skeletal complexes (pelvis, thorax, shoulders) during growth are closely related to alternating periods of growth of *full shapes* with those of *slender shapes*. They are characterized not only by the preponderance at a given moment of the round or thin shapes but more, by the dominance of the increase in length or width and depth in the two intervals (Gh. Ghițescu, 2011).

The sexual differentiation of infantile forms justifies the division of the development into one period of undifferentiated childhood or first childhood (up to eight years) and another of differentiated childhood (bisexual) or second childhood (between eight and thirteen years). Each of the two having a period of full shapes and another of slender shapes. The first increase in length in undifferentiated childhood corresponds to the first period of slender forms, (between four and eight years), when the width and depth predominate and the shoulders increase in the same proportion as the pelvis.

The second period of full forms (between eight and eleven years old), when the increase in width and depth of the shoulders and pelvis dominates again, without the forms having the roundness of the first period. This is the interval when sexual differentiation begins. This brings the development of the chest and shoulders to boys and the development of the hips, buttocks and thighs to girls. The second period of slender forms represents prepuberty (between eleven and thirteen years old). The still soft and round shapes announce the changes of the near puberty by the accentuated increase in height. The pelvis and shoulders have minimal development compared to the waist. In boys, growth is slower, discreet and delayed, continuing upwards in the next period. The pelvis is proportionally narrower than the shoulders and slightly wider in girls. In girls, the increase in height is fast and ends almost abruptly at the end of this period and the morphological changes are faster and more pronounced (Gh. Ghițescu, 2011, T. Vlad, R. Minea, 2019).

Puberty, from thirteen to fifteen years old in girls and up to seventeen years old in boys is the era when width and depth prevail again, the increase in width exceeds the one in length again. The gap between the diameter of the shoulders and

the pelvis occurs in the third period of full forms, backwards for the two sexes. This is the period of fast evolution of the secondary sexual characteristics. Breast development in girls is the first one to occur. An important morphological role in these is the increase of the transversal dimensions of the pelvis and hips, causing waist emphasis. At the end of puberty, the height of the pubic symphysis in comparison with height is approximately that of the adult.

Adolescence is characterized by a slow increase in height and a gradual completion of differences in the width of the shoulders and pelvis. The height, which has almost reached its term, ceases permanently in girls until the age of nineteen, when the sexualization of forms is completed, announcing the adult female characteristics. In boys, it continues at a slow pace until the age of twenty-five. The growth stops as the epiphyses are ossified. The male morphological type, with wide chest and shoulders, strong muscular reliefs and rich and varied surface modeling, is gradually approaching the final appearance (Gh. Ghițescu, 2011).

### 3. Material. Method

#### **Morphofunctional and postural differences visible between teenagers with a good or bad physical condition**

The young artists we are referring to are between 18 and 21 years old. Some of them have a good physical training since their childhood as a result of practising a sport or a constant physical activity, and others have practised to a small extent physical exercises. Within the project entitled: Means and methods for maintaining the students' health at the National University of Arts "George Enescu" carried out in collaboration with the specialization Kinesiotherapy of "Alexandru Ioan Cuza" University and the University of Medicine and Pharmacy "Grigore T. Popa" were applied tests and measurements to a number of student artists in order to identify spinal cord diseases and other somatic disorders. Following the screening carried out between 2015 and 2018, the following data was concluded:

Percentage of somatic and spinal disorders detected in the four assessments (2015-2018)	
Faculty of Visual Arts and Design	25% – 35%
Faculty of Music	15% - 20%

#### **Other studies**

Ego Seeman from Australia and his European colleagues (Tatangelo, G, Sanders K, Seeman E et al, 2018) conducted a study on some gymnasts, both young girls and middle-aged women, and came to the conclusion that not only in the prepubertal period they have a higher bone density, but later in life, former gymnasts have a higher bone density than those who aren't gymnasts. In another study, boys with rigorous physical activity showed a 9% higher bone surface area and a 12% higher bone strength than the less active ones (D. Felsenberg, 2009).

Another study conducted on two groups of women shows that only 11% of women who performed exercises to strengthen their back muscles suffered fractures compared to 30% of those who were sedentary. Also, sedentary women

had a higher risk of suffering a spine compression fracture or a spinal cord compression. This is extremely painful and multiple damaged vertebrae can cause kyphosis or spine curvature (G. Tatangelo, et all, 2017).

#### **4. Conclusions**

Exercise maintains the health of adults' skeletal system. Therefore, physical exercise develops the skeletal system in youth and maintains its health in adulthood. The testing results of students within the project "Means and methods of maintaining the students' health at "George Enescu" National University of Arts showed a higher percentage of students with somatic and spinal deficiencies who belong to the Faculty of Visual Arts and Design compared to students of the Faculty of Music who have practiced a sport since childhood or frequently performed exercises in order to straighten their spine (AC Lese, 2016).

Studies have shown that people who have a better posture and balance, as well as higher muscle strength, have a lower risk of falling, and consequently the risk of fracture decreases. On the other hand, the sedentary ones have a higher risk of hip fracture than the active ones. For example, women who sit for more than 9 hours a day are 50% more likely to have a hip fracture than those who sit for 6 hours a day.

Art students are subjected to vicious positions on a daily basis during their professional development, so physical exercises must be done frequently. The number of hours allocated to the practical physical education course within the university curriculum is not enough to improve their skeletal and muscular system, so it's necessary to do extra exercises on their own in their free time. The beneficial effects of exercise consist in maintaining bone health; in strengthening the back muscles which reduces the risk of spinal fractures; in strengthening / increasing self-esteem and in fighting depression.

#### **Recommendation**

Physical exercise, along with a healthy diet and lifestyle can maintain bone density and slows down the porosity process. By improving balance, endurance and agility, exercise helps prevent falls that lead to fractures. High-impact and bone-strengthening exercises are recommended for young artists - preferably jumping, running, lifting weights instead of swimming or cycling.

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