

# ANTHROPOMETRIC INDICATORS OF VARIOUS DEPARTMENTS OF THE SPINAL COLUMN IN CHILDREN 13-14 YEARS OLD LIVING IN THE SOUTH ARAL REGIONS

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## ABSTRACT

*The anthropometry of the spinal column is the most important indicator of the health of children. Considering that the spine is the support of the skeleton, most diseases begin with the pathology of the spine. It is of particular interest to study the age-related characteristics of the development of various parts of the spinal column in adolescent children, since this is associated with the onset of puberty, the formation of an adult organism. Objective of the study: to study the age-related characteristics of anthropometric indicators of various parts of the spinal column in adolescents aged 13-14 living in the regions of the Southern Aral Sea region. We studied practically healthy children of 13-14 years old, students of school No. 4 of Shavat district. We studied practically healthy children of 13-14 years old, students of school No. 4 of Shavat district. A total of 107 girls and 118 boys were examined in the family polyclinic No. 52 of the Shavat region. The growth processes of the spinal column have significant age and individual differences. The information obtained can give an idea of the peculiarities of the development of the organism in the conditions of a given region, which will make it possible to promptly eliminate the emerging deviations in the development of the spine.*

**Keywords:** Anthropometric indicators, Vertebral column, Southern aral sea region

## INTRODUCTION

The physical development of a growing organism is one of the main indicators of a child's health. The study of anthropometric indicators of various parts of the spine in children and adolescents plays an important role in assessing their physical development in the future. Disturbances in the physical development of a child indicate the presence of various diseases of the body (Navruzov, Ruziboev, & Turamuratova 2019; Baranov, Kuchma & Skoblina, 2008).

Modern socio-economic conditions, despite the implementation of measures to modernize the healthcare system, have an adverse impact on the health of some of the population, primarily children, therefore the primary task

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of healthcare institutions is the development of therapeutic and recreational activities aimed at positive changes in the health indicators of children and adolescents (Baranova, 2006; Bespalova, 2012; Galkina, 2008; Efremova, 2002).

We have to admit that anthropometric studies of the spine in children are very few (Navruzov, Ruziboev, & Turamuratova 2019; Labzin, Rodionov, 2006; Mirbabaeva, 2004). Only one study describes the characteristics of the structure of the cervical vertebrae (Labzin, Rodionov, 2006). A number of authors conducted anthropometric studies without studying the spine (Galkina, 2008; Labzin, Rodionov, 2006; Mirbabaeva, 2004). They paid attention to changes in height, body weight, chest circumference, length of the thigh, lower leg, and shape of the back, but no information was provided from these works about the nature of changes in the spine itself.

### **PURPOSE OF THE STUDY**

Study of anthropometric indicators of various parts of the spinal column in adolescents 13-14 years old living in the regions of the Southern Aral Sea region.

### **MATERIAL AND METHODS**

The material for the study was practically healthy children 13-14 years old - students of school No. 4 in the Shavat district. A total of 107 girls and 118 boys were examined in family clinic No. 52 of the Shavat district. The data obtained was subjected to statistical processing on a Pentium IV computer using the Microsoft office Excel 2010 software package, including the use of built-in statistical processing functions.

### **RESULTS AND DISCUSSION**

Growth processes of the spinal column have significant age and individual differences. During the prepubertal period, growth is observed intensive development of the spine. In the postnatal period, during the first two years, maximum annual increases in the spinal column are observed. Length of the spinal column of a newborn the child is 40% of the length of his body. In the first year of life, the lumbar region grows faster, the cervical, thoracic and sacral regions grow somewhat slower departments. The coccygeal region grows the slowest. The length of the spine increases especially sharply in during the 1<sup>st</sup> and 2<sup>nd</sup> years of life, then the growth of the spine slows down. An increase in the rate of growth of the spine is observed at 7-9 years of age (more in girls than in boys). The next period of active growth of the spine is observed during puberty in children 13-14 years old, when a significant increase in the length of the body is noted (Navruzov, Ruziboev, & Turamuratova 2019; Baranov, Kuchma, & Skoblina, 2008; Baranova, 2006; Bespalova, 2012; Galkina, 2008; Efremova, 2002; Labzin, Rodionov, 2006; Mirbabaeva, 2004). Studies have shown that the total length of the spinal column of 13-year-old girls ranged from 50.53 to 59.89 cm, with an average of  $54.50 \pm 2.72$  cm. The length of the cervical region varied from 6.32 to 7.20 cm, in on average

6.75±0.33 cm. The length of the thoracic region ranged from 27.22 to 31.10 cm, with an average of 29.16 ± 1.54 cm. Lumbar spinal column length ranged from 9.89 to 11.24 cm, with an average of 10.42±0.52 cm. The length of the sacrococcygeal region varied from 8.92 to 10.32 cm, with an average of 9.60±0.33 cm (**Figure 1**).

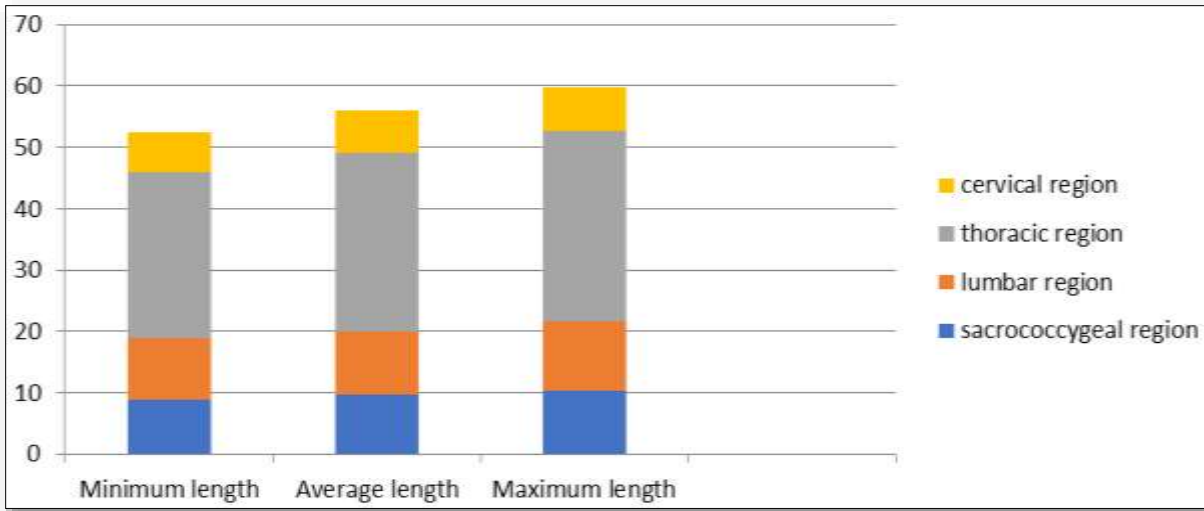


Figure 1. Length of the spinal column and its sections in 13-year-old girls.

Total length of the spinal column of 13-year old boys ranged from 51.12 to 58.54 cm, on average 54.17±2.78 cm. The length of the cervical region varied from 6.15 to 7.17 cm, average 6.65±0.30 cm. The length of the thoracic region ranged from 24.99 to 30.76 cm, on average 27.87±1.55 cm. The length of the lumbar spine ranged from 9.45 to 11.45 cm, with an average of 10.28 ± 0.51 cm. The length of the sacrococcygeal region varied from 8.59 to 11.00 cm, with an average of 9.69±0.42 cm (**Figure 2**).

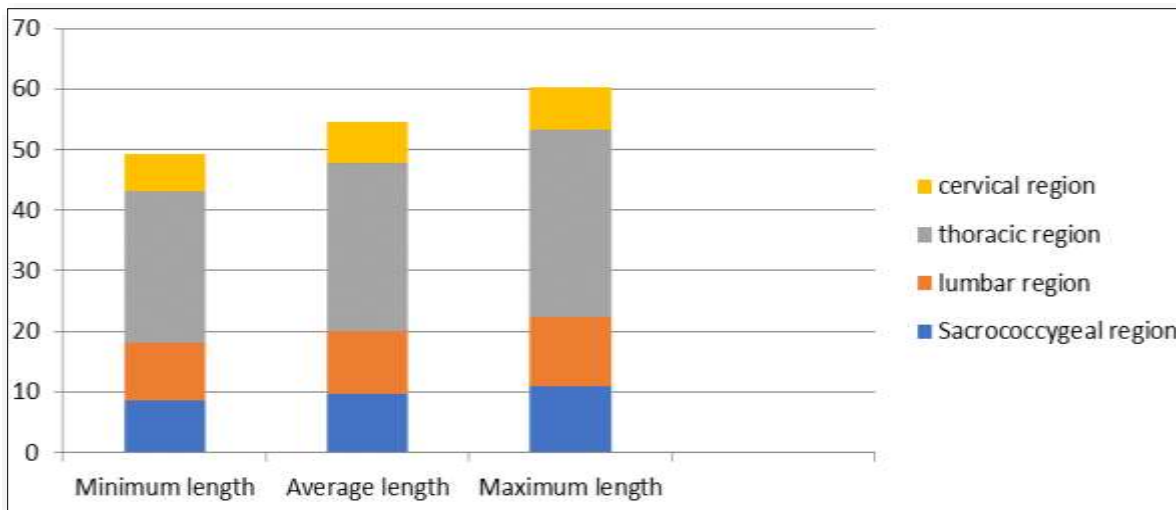
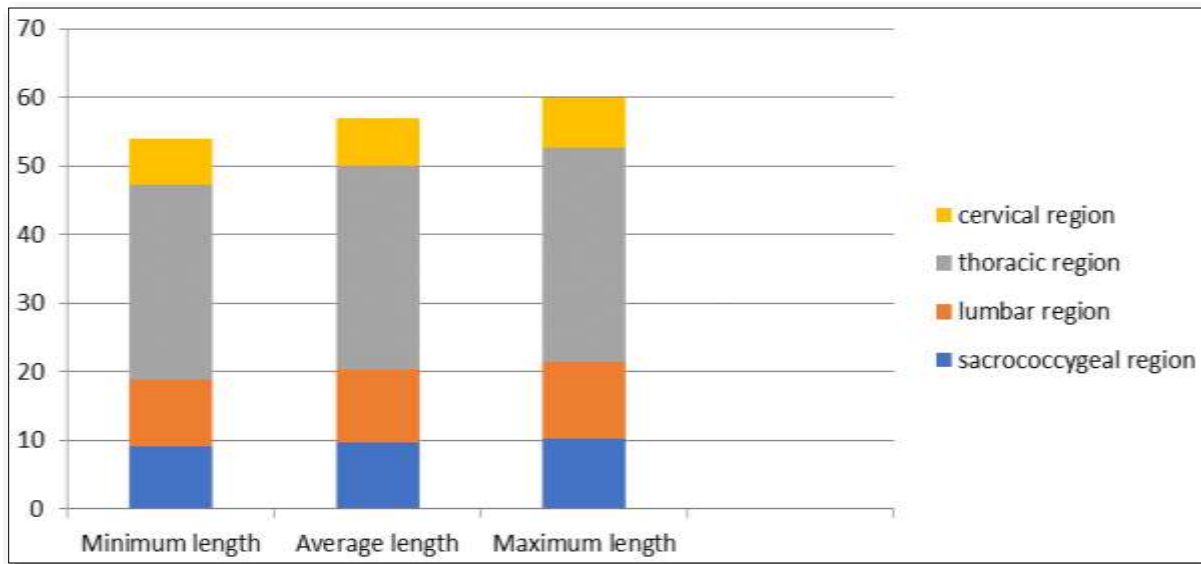


Figure 2. Length of the spinal column and its sections in 13-year-old boys.

The total length of the spinal column of 14-year-old girls ranged from 53.9 to 59.89 cm, with an average of  $56.85 \pm 2.72$  cm. The length of the cervical region varied from 6.6 to 7.2 cm, average  $6.95 \pm 0.23$  cm.

The length of the thoracic region ranged from 28.42 to 31.2 cm, on average  $29.8 \pm 1.54$  cm. The length of the lumbar spine ranged from 9.8 to 11.2 cm, with an average of  $10.5 \pm 0.52$  cm. The length of the sacrococcygeal region varied from 9.1 to 10.32 cm, with an average of  $9.75 \pm 0.33$  cm (**Figure 3**).



**Figure 3. Length of the spinal column and its sections in 14-year-old girls.**

The total length of the spinal column of 14-year-old boys ranged from 51.62 to 63.3 cm, with an average of  $57.45 \pm 2.18$  cm. The length of the cervical region varied from 6.0 to 7.5 cm, average  $6.75 \pm 0.30$  cm.

The length of the thoracic region ranged from 28.4 to 32.6 cm, with an average of  $30.55 \pm 1.1$  cm.

The length of the lumbar spine ranged from 9.5 to 12.5 cm, with an average of  $10.55 \pm 0.52$  cm. The length of the sacrococcygeal region varied from 8.2 to 11.1 cm, with an average of  $9.65 \pm 0.22$  cm (**Figure 4**).

### CONCLUSIONS

Since the spine is formed from early childhood, it is logical to begin the study of morphological changes in the spine in children. The growth processes of the spinal column have significant age-related and individual differences, especially in children 13-14 years old. This is due to the onset of puberty in the physical development of the child.

The increase in the length of the spinal column in female children aged 14 years in the cervical and sacrococcygeal regions occurs more intensely compared to the thoracic and lumbar regions. The increase in the length of the

spinal column in male children aged 14 years in the lumbar and thoracic region occurs more intensely compared to the cervical and sacrococcygeal region.

By the beginning of the period before puberty, growth the spinal column slows down. A new acceleration of its growth is observed in boys by the age of 14, in girls by the age of 13.

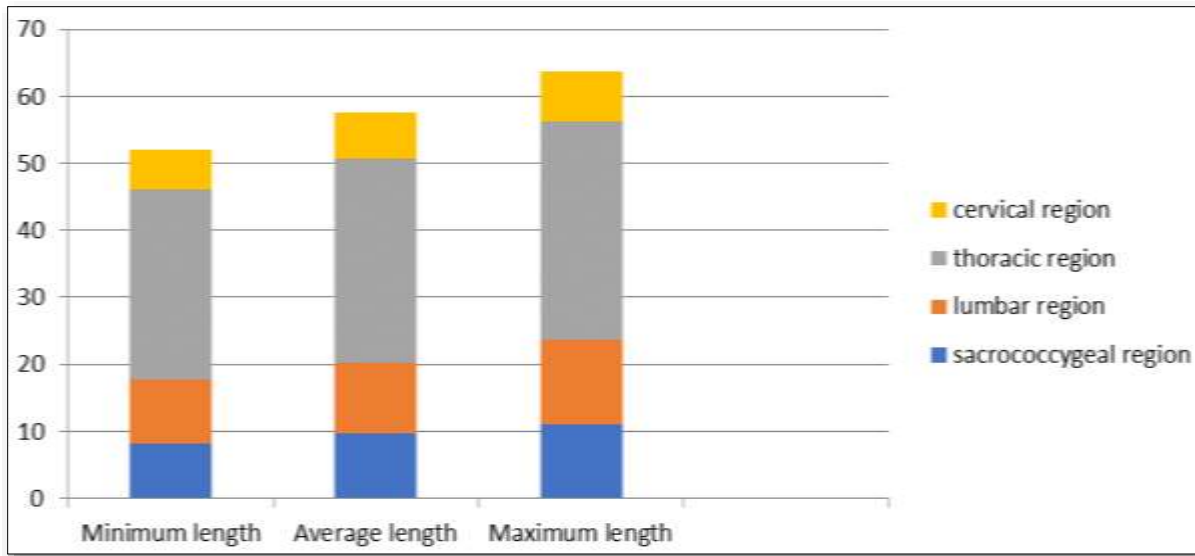


Figure 4. Length of the spinal column and its sections in 14-year-old boys.

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