ANTHROPOMETRIC STUDIES OF THE FEET OF MILITARY PERSONNEL

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Annotation: *Anthropometric studies of the feet at the age of 17-24 years of military personnel were carried out, the dependencies between the main parameters of the lower extremities and the length of the foot were determined, the states of the longitudinal and transverse arches, the shape of the anterior part of the feet of military personnel were determined, and the size of the feet was analyzed for a regional group of military personnel.*

Annotation: *A dimensional range of soles for military personnel has been developed, and anthropometric studies have been conducted. The optimal parameters of the graphic data were obtained by the contact and non-contact method.*

Annotation: *A size-fullness assortment of servicemen's feed has been developed; anthropometric studies have been carried out. Using the contact and non-contact method, the optimal parameters of the graphic data were obtained.*

Keywords: *foot, acceleration, military personnel, rational footwear, contact, contactless, research.*

Due to the process of growth and acceleration, providing rational footwear for military personnel is considered an urgent task today. In this regard, anthropometric studies of the feet in the age of 17-24 years of military personnel were carried out, during which the dependencies between the main parameters of the lower extremities and the length of the foot were determined, the states of the longitudinal and transverse arches, as well as the shape of the anterior part of the feet of military personnel were determined. During the measurements, 210 employees were examined. The values of the following dimensional features are determined: foot circumference along the outer and inner bundles (Fco, Fci). Based on the plantography method, the long-range and latitudinal parameters of the stops are established.

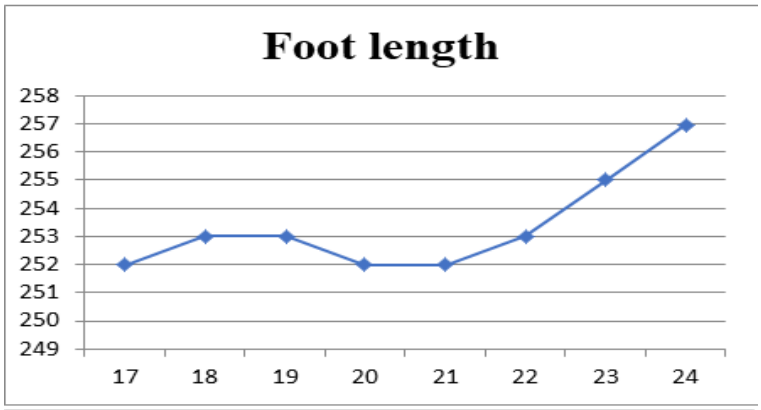
Statistical indicators of the distribution of the size of the feet of military personnel are shown in the table.

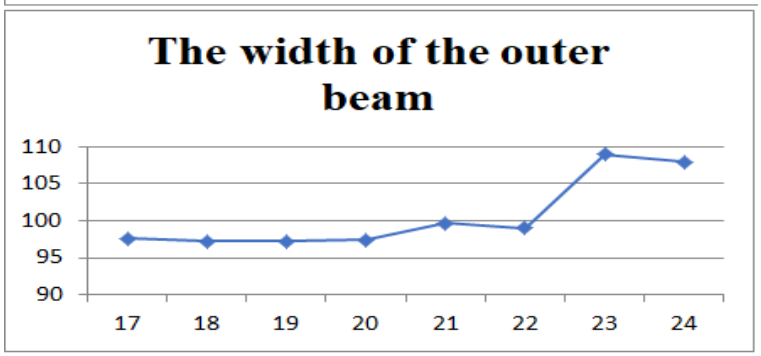
Table-1

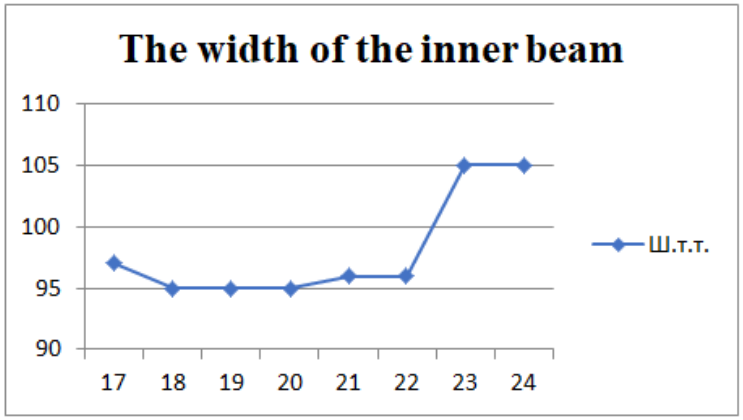
Anthropometric indicators	Foot length, mm M±m	Width of the outer beam, mm M±m	Width of the inner beam, mm M±m	Heel width, mm M±m	Girth in bundles, mm M±m

Age	Military personnel				
17	250±0,1	97,6±0,6	97±0,6	66±0,1	195,2
18	253±0,9	97,2±0,2	95±0,8	61±0,7	194,4
19	253±0,7	97,2±0,2	95±0,9	62±0,6	194,4
20	252±0,3	97,4±0,4	95±0,4	69±0,2	194,8
21	246±0,4	99,7±0,7	96±0,2	66±0,8	199,4
22	253±0,8	95±0,5	94±0,4	62±0,4	190
23	255±0,1	109±0,9	107±0,1	70±0,1	218
24	257±0,5	107,5±0,5	105±0,1	73±0,1	215

As a result of processing anthropometric data, the equations of the relationship between age and dimensional signs of feet are calculated.







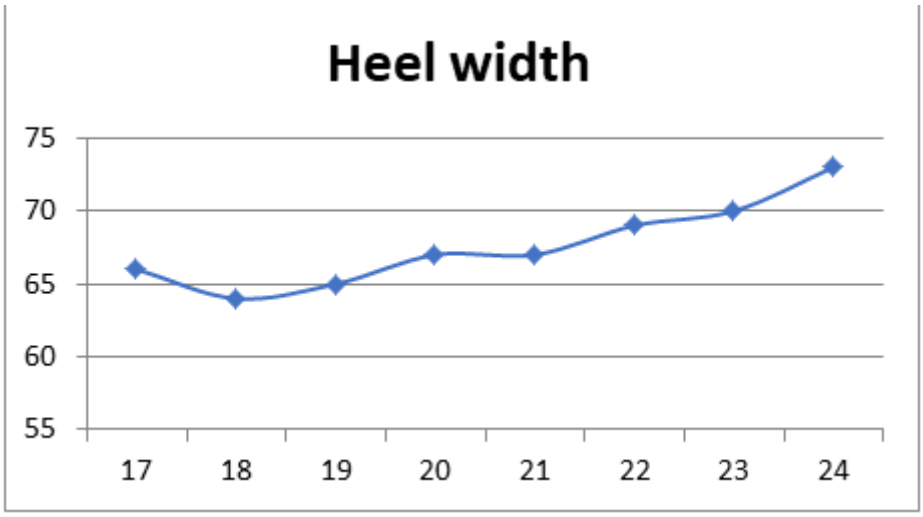


Figure 1. Diagrams of the dynamics of foot development by age, a is the length of the foot, b is the width of the outer bundle, c is the width of the inner bundle, d is the width of the heel.

The diagram shows the dynamics of foot length growth depending on age. The data indicate that the foot length of military personnel increases from 230 to 280 mm. During this period, the length of the foot increases by 50 mm. The largest annual increase in foot length is observed at the age of 24 years and is 280 mm.

The width of the outer beam increases from 97 mm to 112.5 from 17 to 24 years old (Figure 2) and during this period the width of the outer beam increases by 14 mm. Thus, with age, the average relative increase in foot width is less than the corresponding increase in foot length. The average width of the outer beam is relatively uniform and is 2-4 mm.

The data on measuring the width of the inner beam are shown in Figure 3. From the data shown, it can be seen that the width of the inner beam at the age of 17 is on average 98 mm and increases to 13 mm by the age of 24. The largest annual increase in the width of the inner beam is observed in the period from 23 to 24 years, it is 10-12 mm. The results of measuring the heel width are shown in Figure 4. From the data provided, it can be seen that the heel width at 17 years old is 66 mm. Then it gradually increases and reaches 73 mm at the age of 24. Girth through bundles increases from 184 to 228 mm from 17 to 24 years old. During this period of time, the girth through the kidneys increases by 44 mm. To establish the relationship between the main dimensional features of the foot and the age of the subjects, we calculated regression equations. [4-5].

Since the foot, as the most loaded part of the musculoskeletal system, develops and changes its shape throughout a person's life.

In connection with the above, anthropometric studies of the shape and size of the feet of military personnel is an urgent task.

In [2], anthropometric studies of the feet of military personnel were carried out. Studies on foot arches in military personnel have different limits of variation. The variability of individual typological and morpho functional characteristics of the human body is influenced by environmental and social factors, processes of acceleration. As a result of the research, the main pathological abnormalities of the foot and morphological features of the arches of the feet were established.

Anthropometric studies of the feet of military personnel aged 17 to 24 years showed that one in five young people has various mild or severe deformities of the foot. This suggests the likelihood of further development of the disorder.

Having studied the main anthropometric characteristics of the feet, it can be concluded that most of the dimensional features of the foot and shin change significantly with age and suggested that the following age groups should be distinguished when developing an assortment of military shoes: I-th adult – 17-20 years old, II-th adult – 21-24 years old.

The condition of the foot was determined by the plantographic method, which consists in obtaining prints of the plantar surface of the feet. As a result, new data on the features of the anatomical structure of the feet of military personnel were obtained. The main areas of the feet that experience the greatest shock load when walking have also been identified.

The number of military personnel by individual age groups is shown in table 2.

Table 2

The population of military personnel by individual age groups

Gender	Total	Including age, years	
		17-20	21-24
Male	210	170	40

When selecting shoes, military personnel have difficulty matching the size of their feet. This is due to the discrepancy between the size range used by manufacturers and the actual distribution of foot sizes by region for which shoes are made.

In order to obtain new data on the shape and size of the feet, anthropometric studies of the feet of military personnel were carried out.

We have revealed that out of 210 military personnel:

- Tashkent city – 8 people
- Kashkadarya city -42 people
- Surkhandarya city – 43 people
- Andijan city -20 people
- Namangan city – 18 people
- Samarkand city – 45 people
- Navoi city -9 people
- Khorezm city – 25 people

The quantitative composition of military personnel by region:

The measurement results showed that the long and wide foot sizes of military personnel from Kashkadarya and Surkhandarya regions are the larger than in other regions. This is due to the place of birth of the serviceman.

Thus, as a result of the work carried out, anthropometric information was obtained on the shape and size of the feet and shins of military personnel, an age group was identified, the parameters of the conditional average foot of the selected group were determined, necessary to create a rational internal shape of military shoes and clarify the dimensional typology of the feet, and data on the size of the shins of military personnel will help to more accurately design boots with high boots.

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