CHARACTERISTICS OF SOMATOTYPES IN KYRGYZ WOMEN

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Abstract

It should be considered that the body constitution which is widely used in the preventive and clinical medicine leaves an imprint on the body mass index. The objective of this work is to study the features of body mass index and fat body mass in females of different compositional and age groups. Materials and Methods. Using the method of complex anthropometry and bioimpedancometry ("Medass"), we have also studied the physical status of 580 ethnic Kyrgyz women from Osh, Kyrgyzstan and its surroundings. Statistical data processing included the calculation of arithmetic mean and error, as well as the minimum and maximum of each indicator (variation amplitude). The significance of difference was assessed by Student's t-test. Results. The body length and weight and, accordingly, the body mass index, significantly depend on the type of body constitution. The absolute fat mass is also unequal in women of different compositional groups. The minimum and maximum of the absolute and percentage fat mass in women of the period of adulthood II with different body constitutions are, in general, more than in juvenile period. Conclusion. The obtained results can be used to develop measures aimed at the timely detection of overweight and obesity as well as for the implementation of measures to prevent alimentary-related diseases in juvenile and adulthood period. Somatometric assessment of the physical development can be used in the dynamic monitoring of health status in organized groups: in educational institutions, youth sports schools, enterprises.

Keywords: body mass index (BMI), body constitution, physical state, adaptive potential, somatotype.

ХАРАКТЕРИСТИКИ СОМАТОТИПОВ У КЫРГЫЗСКИХ ЖЕНЩИН

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Аннотация

Следует учитывать, что конституция тела, широко используемая в профилактической и клинической медицине, оставляет отпечаток на индексе массы тела. Целью данной работы является изучение особенностей индекса массы тела и жировой массы тела у женщин разных композиционных и возрастных групп. Материалы и методы. Используя метод комплексной антропометрии и биоимпедансометрии («Медасс»), мы также изучили физическое состояние 580 этнических киргизских женщин из Оша,

Кыргызстан, и его окрестностей. Статистическая обработка данных включала расчет среднего арифметического и погрешности, а также минимума и максимума каждого показателя (амплитуды вариации). Значимость различий оценивалась с помощью t-критерия Стьюдента. Результаты. Длина тела и вес, а соответственно, индекс массы тела, существенно зависят от типа телосложения. Абсолютная жировая масса также неодинакова у женщин разных групп телосложения. Минимум и максимум абсолютной и процентной жировой массы у женщин периода зрелости II с различными типами телосложения, как правило, больше, чем в ювенильном периоде. Вывод. Полученные результаты могут быть использованы для разработки мер, направленных на своевременное выявление избыточного веса и ожирения, а также для реализации мер по профилактике заболеваний пищевого происхождения в ювенильном и взрослом периодах. Соматометрическая оценка физического развития может быть использована в динамическом мониторинге состояния здоровья в организованных группах: в образовательных учреждениях, молодежных спортивных школах, на предприятиях.

Ключевые слова: индекс массы тела (ИМТ), конституция тела, физическое состояние, адаптивный потенциал, соматотип.

Introduction

The current stage in the development of medical science is characterized by a growing interest in the problem of the compositional human typology (Larsson et al., 2020). The relevance of using the compositional-typological approach in a comprehensive study of the body is scientifically based and in demand by time (Kropta & Sedukin, 2023). The somatic type, which is formed during the implementation of the hereditary program in a specific environment, reflects the level and harmony of the physical development of both the individual and the population. There is a lot of information about the dependence of the morphological and functional characteristics of individual organs and systems of the human body on the types of body physique. However, in practice, to date, the features of individual anatomical variability of organs and systems are not always compared with the compositional features of the subjects (Larsson et al., 2020; Kropta & Sedukin, 2023).

Compositional anatomy and medical anthropology, revealing the forms and factors of the organism's variability, work closely with clinical medicine. Compositional issues are in the sphere of interests of these sciences, based on the compositional and anatomical approach. The feasibility of conducting research for clinical purposes is due to the repeatedly proven fact of a compositional predisposition to the development of a number of diseases, the uneven effectiveness of the treatment of a number of nosological forms with different physique features (Petuhov et al., 2017; Larsson et al., 2020).

Over the past few decades, a significant number of works have appeared that study the variability of the physical development of individuals to a greater extent from the position of morphological and functional features, which, apparently, is associated with such a phenomenon in the population as acceleration and retardation. However, the works devoted to the study of the morphological and functional characteristics of young people during the

"post-acceleration" period and the metabolic manifestations that provide these changes are practically absent (Bredella, 2017).

The most important issue of compositional anatomy and physiology is the study of the physical development of people of various territorial groups, on the basis of which standards for the physical development of various populations are compiled. It should be noted that the standards being developed require periodic updating in connection with the process of acceleration of human somatic development. This emphasizes the need for periodic development of age-gender regional standards and norms of physical development, various geographic and economic regions.

Compositional features determine the biological processes; in case of leptosomatic (asthenic) body type, the processes of growth and development are often slowed down and stretched in time, whereas in case of hypersthenic body type, they are accelerated (Tutelyan et al., 2017).

It should be considered that the body constitution which is widely used in the preventive and clinical medicine leaves an imprint on the body mass index (BMI) (Chtetsov et al., 2012; Lopes et al., 2017; Villamor et al., 2017).

If BMI is less than 18.5 chronic energy deficiency is indicated. BMI over 25 shows excess body weight and obesity if it becomes over 30. Nevertheless, BMI assessment without regard to the person's body constitution as well as the application of the same standard to different somatotypes is methodologically incorrect. For example, asthenic (thin and small) or pyknic somatotypes (compositionally characterized by excessive fat deposition) should be considered different (Madden & Smith, 2016; Merrill et al., 2017).

For instance, in the Hungarian population more than half of the population above the age of 15 years fixed by Maximova et al. (2009) overweight, while every fifth person is obese. In a cross-sectional study, of the 123 adolescents 21.65% were found to be overweight and 6.37% obese by the international BMI criteria.

According to Mazidi et al. (2018), the average height of the juvenile girls in Hungary was 156.95±10.44 cm; weight – 43.52±8.64 kg; BMI – 17.51±2.04 kg/m2; body fat percentage – 23.50±4.39%. Obesity, however, was defined based on BMI, which is an imperfect measure of body fat. It is not clear whether body fatness is a stronger predictor of obesity-related health outcomes or BMI (Kaj et al., 2013). BMI is highly correlated with the body fat at every level. Obesity in adulthood is an increasing problem worldwide that could be traced back to adiposity and obesity in childhood and adolescence (Henrique et al., 2020). Adiposity in childhood persists in the adolescents, and permanent obesity often leads to many diseases later on like cardiovascular, respiratory, musculoskeletal disorders and a variety of physiological and psychological problems. Obesity will cause disregulation of adipocytokines (TNF-⌧, IL-6, adiponectin) early in life (Bredella, 2017). These agents are important in carbohydrate and fat metabolism of fat cells and by this inducing atherosclerosis and type 2 diabetes. This fact is mirrored in Conrad's MIX, since it is showing the ratio of muscle and fat in the body (Schuster et al., 2018).

Individual variability of the human body is understood as the change in physiological, biochemical, and morphological characteristics that determine the diversity of the morphological and physiological organization of closely related individuals (Kropta & Sedukin, 2023). At the same time, it is fair to say that there is a need to accumulate new data, create a data bank on the anatomical and anthropological compositional variability of all organs and systems of the body since the available materials are incomplete and fragmented

[2-4]. We can note that Petuhov et al. (2017) as well as Tutelyan et al. (2017) outline only trends but they are not backed by modern evidence-based mathematical apparatus and many results are difficult to compare.

There are some articles on the internet where BMI and absolute fat mass of Kyrgyz women were discussed but we have not found any report about their body constitution which is an important aspect when considering weight. There has been only one study about anthropometric features of ethnic Kyrgyz of different age groups, but it included data about growth-weighted indexes of men of youthful and mature age and not comprised any considered information about women (Sakibaev et al., 2019, 2021; Zhanybek kyzy et al., 2023).

Another study we found, was dedicated to the prevalence of childhood and adolescent overweight and obesity in Asian countries but this research has no information about the somatotype of the considered groups (Mazidi M, et al., 2018). That's why our research aim was the study of the composition features of the Kyrgyz women with study the features of BMI and fat body mass in females of different compositional and age groups.

Material and method
This was retrospective study where all actual research material was collected in the period from 2009 to 2021. The complex of anatomical and anthropometric examinations was in accordance with generally accepted ethical standards. It was approved by the decision of the local ethics committee of the Institute of Medical Problems of the Southern Branch of the National Academy of Sciences of the Kyrgyz Republic (protocol No. 4, October, 12, 2016). All subjects signed an Informed Consent Form to participate in anthropometric studies. The sampling was based on the principle of voluntary participation.

We used the generally accepted traditional scheme of age-related periodization of onto-genesis. In the study complex anthropometry and bioimpedancemetry ("Medass") method has been used. Physical state of 580 ethnic Kyrgyz women from Osh, Kyrgyzstan and its surroundings has been studied. Therefore, the study included women in the juvenile, adulthood I, and adulthood II periods. The subjects did not include cases with diseases affecting the physical status such as alimentary-dependent pathology and degenerative-dystrophic diseases.

Study participants characteristics
In the study were included 580 females of follow age groups: youth 16-20 years of 190 girls that became the first studied group; 1st adulthood period women 21-35 years – of 185 persons (second studied group); 2nd adulthood period 36-55 years of 205 persons that were formed a third studied group.

The average age of the first studied group was 18.5±2.2 years; for the second group the average age was 29.6±2.5; and for the third – 44.6±1.5. In divided participants according to the age, 'Schema age periodization in ontogenesis' was used. This schema was approved at the VII All-Union Conference on Problems of Age-Related Morphology, Physiology and Biochemistry (USSA, Moscow, 1965).

Laboratory research approach

The method of bio-impedancemetry was based on measuring the body tissues' bioelectric resistance ("impedance" resistance, "bio-impedance" resistance of the body tissues) by the bio-impedance analyzer.

In this case, an integral assessment of body composition is carried out using several component models: 1) fat mass analysis; 2) analysis of total ratio of the body tissues. So, we have studied the content of adipose tissue and active cell mass, indicators of metabolic rate and the ratio of extracellular to intracellular fluid. Based on the obtained parameters, conclusions are drawn about normal or impaired tissue hydration, lipid, and water-salt metabolism. Body constitution state has been analyzed according to the scheme of Galant, Nikityuk, and Chetsov (1983).

Bioimpedansometry study

Bio-impedance analyzer allows us determine the biological age of the person and at the same time monitor the results throughout the entire period of work.

Using a four-electrode technique on the arms and legs, an electric field is created, and the alternating current impedance is measured, which consists of the resistance (Rx) and reactance (Xc), as well as the phase shift of the alternating current.

The stature was measured by a height meter. When measuring stature, the subjects stood with their backs to the vertical wall stand. The regulator was lowered until it touched the head. The BMI was determined by dividing the weight in grams by the height in centimeters. Weight was measured by using weights.

Research data processing

Statistical data processing included the calculation of arithmetic mean and error, as well as the minimum and maximum of each indicator (variation amplitude). The significance of difference was assessed by Student's t-test.

The statistical significance of the research results is a measure of confidence in its "fidelity" ("representativeness of the sample"). More precisely, the p-level is an indicator inversely proportional to the reliability of the result. A higher p level corresponds to a lower confidence level found in the sample results. P-level = 0.05 (i.e., 1/20) shows that there is a 5% probability that the relationship between the variables found in the sample is just an accident in this sample. In other words, if this dependence is in the general data set and similar experiments were carried out many times, then in approximately one of twenty repetitions of the study, one can expect the same or stronger dependence between the studied variables. In many studies, a p-level of 0.05 is considered the "acceptable level" of error. During statistical data processing, methodological guidelines were used on the main methodological techniques of statistical analysis in biological and medical research.

Results

We have founded that leptosomatic group of body state was determined in 20% patients, while the mesosomatic type was noted in 32%, the megalosomatic type was recorded in 33%, and an indefinite group was established in 15% among studied women. At the same time, during the transition from juvenile period to adulthood I period, and then to the adulthood II period,

no fundamental changes in the compositional features were observed, which corresponds to the concept of Nikityuk and Chetsov (1983) on the modification nature of these changes.

It was fixed that, the body composition type has its impact on the body's height and weight as well as BMI. And this dependency was significant (Table 1). In adult females of the leptosomatic group, the body height was the same to the mesosomatic group which was less than in the megalosomatic and indefinite compositional groups (1.1 times; p <0.05).

• *Table 1. Weight-for-height and the BMI in the juvenile, adulthood I, and adulthood II periods in females of different compositional groups (X + Sx; min-max)*

Period and age	Compositional groups			
	Leptosomatic	Mesosomatic	Megalosomatic	Indefinite
Body height, cm				
Juvenile	158.5+0.6	161.7+0.5	167.1+0.6	173.5+0.5
	142.0-166.2	149.0-165.9	154.8-189.0	160.3-175.9
Adulthood I	161.9+0.6	161.9+0.3	168.5+0.6	167.5+0.5
	142.7-165.8	154.5-165.4	156.4-190.5	156.3-170.9
Adulthood II	154.6+0.5	160.3+0.3	165.4+0.9	167.9+0.4
	143.2-164.5	152.1-166.3	154.2-192.4	156.5-172.5
Body weight, kg				
Juvenile	44.5+0.5	56.4+0.4	70.9+0.6	71.6+0.6
	36.4-54.5	42.6-64.9	56.4-92.3	56.5-70.2
Adulthood I	45.2+0.5	68.4+0.4	77.5+0.6	72.3+0.6
	39.9-56.5	54.3-82.3	62.3-98.6	60.4-75.1
Adulthood II	46.2+0.4	74.0+0.6	85.1+0.6	86.0+0.6
	39.9-57.4	55.3-84.4	68.4-99.6	68.0-94.2
Body mass index				
Juvenile	17.1+0.2	21.5+0.3	25.3+0.2	23.8+0.3
	12.2-24.5	14.2-28.1	20.2-30.4	18.2-27.4
Adulthood I	17.6+0.3	26.2+0.2	24.9+0.2	25.8+0.3
	15.2-24.4	20.2-29.5	20.7-30.8	21.4-31.4
Adulthood II	18.7+0.3	28.8+0.2	31.2+0.2	30.5+0.2
	16.8-24.5	23.4-32.4	24.3-38.1	23.2-33.4

The minimum and maximum body lengths in women with leptosomatic body constitution of the considered age were slightly less than those in women of the megalosomatic and indefinite compositional groups. We also revealed a tendency according to which the body length slightly increases and then decreases during the transition from juvenile period to adulthood I period. An age-related decreasing of the body length in the adulthood II period was probably associated with a flattening of the arches of the foot, a decrease in the thickness

of the intervertebral discs and an increase in the sagittal curvature of the spine, which are proven anatomical facts.

In leptosomatic juvenile period, the body weight was less than in mesosomatic (1.3 times; p <0.05), megalosomatic, and indefinite compositional groups (1.6 times; p <0.05). In the adulthood I, the body weight in women of the leptosomatic group was less than in the mesosomatic (1.5 times; p <0.05), megalosomatic (1.7 times; p <0.05), and indefinite groups (1.6 times; p <0.05). In the adulthood II, the body weight in the women of the leptosomatic group compared with the women of the mesosomatic group, was less by 1.6 times (p <0.05) whereas it was less by 1.8 times in the megalosomatic group (p <0.05), and by 1.9 times in the indefinite group (p <0.05). The minimum and maximum body weights in leptosomatic women of the age groups considered by us were less than in megalosomatic and indefinite groups of body constitution.

The standard value of BMI also depends on the body constitution (Table 1). BMI in the leptosomatic females in the juvenile period was less than that in the mesosomatic (1.2 times; p <0.05), megalosomatic (1.5 times; p <0.05), and indefinite (1.4 times; p <0.05) groups. In the adulthood I, the BMI in the women of the leptosomatic group was less than that in the mesosomatic (1.5 times; p <0.05), megalosomatic (1.4 times; p <0.05), and indefinite (1.5 times; p <0.05) groups. In the adulthood II, the BMI in women of the leptosomatic group compared with the women of the mesosomatic group, was less by 1.6 times (p <0.05) whereas it was less by 1.7 times in the megalosomatic and indefinite groups (p <0.05).

BMI and body weight, regardless of the compositional group, increase by adulthood II, which should be also considered when assessing standards. Minimum and maximum values of BMI in leptosomatic women of all examined age groups were less than those in other body compositions. The absolute fat mass is also unequal in women of different compositional groups (Table 2).

• *Table 2. The absolute fat mass in the juvenile, adulthood I, and adulthood II periods in females of different body compositions (X + Sx; min-max; kg and %)*

Age period	Compositional groups			
	Leptosomatic	Mesosomatic	Megalosomatic	Indefinite
Juvenile	8.5+0.2	17.8+0.4	26. 8+0.4	17.6+0.8
	5.5-11.8	12.4-32.0	18.4-35.5	12.2-30.0
Adulthood I	8.7+0.2	19.4+0.4	28.3+0.4	20.6+0.3
	5.7-12.9	11.7-33.5	16.0-36.0	22.1-30.0
Adulthood II	9.7+0.1	21.2+0.4	34.1+0.5	25.4+0.8
	8.7-13.3	13.7-34.5	18.2-49.0	20.0-36.4

Considering the absolute fat mass in the juvenile period of the leptosomatic body constitution, its content in the juvenile period of the mesosomatic and indefinite body compositions prevails by 2.1 times (p <0.05), whereas in the megalosomatic body composition, it does – by 3.2 times (p <0.05). In women of the leptosomatic group of the adulthood I, the absolute fat

mass was 2.3 times less than that in women of the mesosomatic group (p <0.05), while in megalosomatic and indefinite compositions, – it was less by 3.3 (p <0.05) and 2.4 (p <0.05) times, respectively. In women of the leptoso- matic composition in the adulthood II, the absolute fat mass was 2.2 times (p <0.05) less than that in women of the mesosomatic, while in the megalosomatic and indefinite compositions, it was less by 3.6 (p <0.05), 2.7 (p <0.05) times.

Stenoplastic (66-77%) type dominated in the structure of the leptosomatic constitution and asthenic thin-boned (18-24%) and broad-boned (5-10%) types were rare. Among mesosomatic constitution females, the proportion of mesoplastic (31-66%) was greater than the pyknic (34-69%) somatotype. The structure of megalosomatic constitution persons dominated euryplastic tall (22-35%) and short (58-59%) somatotypes. Rarely, were fixed sub-athletic (5-16%) and especially athletic (0.8-4.4%) somatotypes.

We analyzed the features of the absolute fat mass in the age aspect. The absolute value of the index in the leptosomatic women of adulthood I has not changed compared with the juvenile period, whereas in adulthood II, it has increased by 1.1 times (p <0.05). The absolute fat mass in females of the mesosomatic composition in the adulthood I, was 1.1 times higher (p <0.05) than it was in juvenile period, while it was 1.2 times (p <0.05) higher in the adulthood II. The absolute fat mass in women of the megalosomatic body composition in the adulthood I and II, was 1.1 and 1.3 (p <0.05) times higher (p> 0.05) than it was in juvenile period, respectively. The absolute fat mass in women of the indefinite body composition in the adulthood I and II, was 1.2 and 1.5 (p <0.05) times higher (p <0.05) than it was in juvenile period, respectively.

The minimum and maximum values of the absolute fat mass and its percentage in women of the adulthood II of different body compositions are, in general, more than in juvenile period.

Discussion

Consequently, our hypothesis of the study is confirmed. The body length and weight and, accordingly, the BMI, significantly depend on the type of body composition. The absolute fat mass is also unequal in women of different compositional groups. The minimum and maximum of the absolute and percentage fat mass in women of the period of adulthood II with different body compositions are, in general, more than in juvenile period.

Data obtained during somatometry and somatotyping at different age periods indicate that the process of body formation occurs not only during juvenile period, but also continues in adulthood (Sakibaev et al., 2019; Nuruev et al., 2023;). In this bioimpedansometry approach was used that has been considered accurate for measuring individuals or for tracking an individual's body composition over a period of time.

Cell tissue impedance can be modeled as a resistor (representing the extracellular path- way) in parallel with a resistor and capacitor in series (representing the intracellular pathway).

This pattern leads to a change in impedance compared to the frequency used in the measurement. The impedance measurement is usually measured from the wrist to the contralateral ankle and uses either two or four electrodes. A small current of the order of $1-10$ μA passes between two electrodes, and the voltage is measured between the same (for a two-electrode configuration) or between two other electrodes (Chtetsov et al., 2012).

It must be considered that women performed and are performing diverse educational, reproductive, social, industrial, and social functions. Therefore, the health of the nation is largely determined by the health of women. Most authors believe that at the age of 17-

21 years, the process of growth and formation of the body basically ends, and all the main proportional signs of the body reach their final value. At present, somatometric studies focus on regional differences in anthropometric indicators on a regional and national scale in order to identify geographically and environmentally determined, as well as ethnic features of the body structure and physical development of people.

Variants of the female composition are described by such anthropological indicators as body height, fat deposition rate, and body proportions. Body composition divided into types that differ in morphological and psychophysiological characteristics as well as in chronobiological state and body's functional state variability due to the compositional level of the organism's reactivity. So, accumulation of knowledge in the female body's development patterns remains an urgent tasks of modern preventive medicine (Sakibaev et al., 2019; Nuruev et al., 2023).

In our research, we have got new data for the Kyrgyz women population. It has been gotten that mesosomatic (31-33%) and megalosomatic (30-38%) constitutions dominated among women in adolescence and adulthood. The proportion of leptosomatic (15-25%) and indefinite (12-16%) constitutions was significantly lower in this group. Moreover, stenoplastic (66-77%) type dominated in the structure of the leptosomatic constitution compare to the asthenic thin-boned (18-24%) and broad-boned (5-10%) types. And for the mesosomatic constitution, mesoplastic constitution (31-66%) was greater compare to the pyknic (34-69%) somatotype. The euryplastic tall (22-35%) and short (58-59%) somatotypes were prefer to megalosomatic constitution persons compare to sub-athletic (5-16%) and especially athletic (0.8-4.4%) somatotypes. It has to be noted that similar results were obtained by Starchik and Nikitiyk (2015) for the Slavic women population (Saratov Region) who noted that subathletic (54.1%) and stenoplastic (14.9%) somatotypes were previous for tested women population. The picnic type was fixed in 4.1%, athletic in 3.4%, and asthenic type fixed extremely rarely (0.7%). We must say that mesoplastic and euryplastic constitutional types were not identified, although there could not be women of these somatotypes in the population. Probably, some disagreements with our data may be due to the presence of regional specificity of the "constitutional diversity" of the population (Nikityuk & Chetsov, 1983), as well as age-related modifications of the somatotypological status, since the authors studied girls' physical status mainly (Starchik & Nikitiyk, 2015).

Particularly significant can be our obtained data on the somatotypological specificity of BMI. Martinchik et al. (2017) as well as Pedram et al. (2011) noted that diet correction as well as eating behavior correction and treating introduction have to be done after diagnostics and the most valuable will be the rapid diagnostic methods/ This approach could prevent more than 300 thousand deaths each year.

BMI determination makes it possible to identify risk groups for the development of nutritional obesity or anorexia which is essential for teenagers in most. This data can give us the possibility to introduce treatment or carry out individual preventive measures (Pedram et al., 2011; Polumeeva, 2021; Kosolapov et al., 2023). At the same time, BMI in the clinic is currently considered on average for the entire population as a whole, without age-sex gradations (Kosolapov et al., 2023). Based at our data, we can a connection between the BMI value and the somatotype. It has been fixed that in norm women BMI varies from 15.6-17.7. In an asthenic tall thin-boned somatotype BMI fixed at 28.8-35.6. In women with short euryplastic somatotypes BMI was fixed, previously, at 26.0-35.4. For all other somatotypes, BMI values occupy an intermediate position.

BMI increases in the transition period (from adolescence to the second adulthood period) for women, these changes are maximum for the picnic and euryplastic somatotypes (Martinchik

et al., 2017; Polumeeva, 2021). These changes were most visible in women of asthenic and stenoplastic somatotypes in our research. We have to mark the importance of the presented research in demonstrating body composition in Kyrgyz women of adolescence and adulthood. The absolute content of the body fat component can be associated with the characteristics of the somatotype: fat component was minimal in asthenic women's somatotype (7.0-8.9 kg) as well as stenoplastic (10.5-11.1 kg) somatotypes. The maximum values were fixed in euryplastic tall somatotype (32.0-46.8 kg). Moreover, in the transition period (from adolescence to the second adulthood period) body fat component content in women increased from 17.6 to 22.5 kg.

This tendency was studied by Parfenova and Sveshnikov (2007) as well as Nikolenko et al. (2017). According to their data, in girls aged 16-20 years, there is almost no significant increase in the content of the fat component of the body with a hypersthenic physique, and for the period from 21 to 70 years, the content of adipose tissue increases only by 5.0%. The increase in the content of the fat component in women of normosthenic physique is maximum at the age of 31-65 years (by 8%), in asthenic somatotype – 26-60 years (by 3.6%) (Parfenova & Sveshnikov, 2007). Nikolenko et al.(2017) gave data obtained from the study of girls and women and the first adulthood period The content of adipose tissue in women was 14.73 + 0.73 kg; muscular of 23.7+0.36 kg; and fat content of 8.31+0.13 kg. However, author's research did not consider these indicators differentiated by somatotypes and had just a general nature.

We have to underscore in advantages of our study including inexpensiveness. Moreover, in the medical context, the obtained results can be used to develop measures aimed at the timely detection of overweight and obesity. It can be used in the implementation of measures to prevent alimentary-related diseases in the juvenile and adulthood periods. Somatometric assessment of physical development can be used in the health state monitoring in organized groups such as educational institutions or youth sports schools. The assessment of the individual-typological features of the individuals' physical development can be used in the regional biomedical programs development aimed at strengthening and preserving the younger generation's health. Presented data can be also used in screening programs.

Conclusion

In this article, we aimed to study features of BMI and fat body mass in females of different compositional and age groups. As a result of the study, compositional and age peculiarities of body length, body weight, BMI, and the absolute fat mass were revealed, the knowledge of which is important for practical medicine. The body length and weight and, accordingly, the BMI, significantly depend on the type of body composition. The absolute fat mass is also unequal in women of different compositional groups. The minimum and maximum of the absolute and percentage fat mass in women of the period of adulthood II with different body compositions are, in general, more than in juvenile period. The obtained results can be used to develop measures aimed at the timely detection of overweight and obesity as well as for the implementation of measures to prevent alimentary-related diseases in juvenile and adulthood period. Somatometric assessment of the physical development can be used in the dynamic monitoring of health status in organized groups: in educational institutions, youth sports schools, in enterprises. The assessment of the individual-typological features of the physical development of individuals can be used in the development of the regional biomedical programs aimed at strengthening and preserving the health of the younger generation.

Practical approach

The proposed approach in the detection of somatotypes can be introduced in medical practice for the detection of overweight and energy deficit (low body mass). Presented constitutional and gender features have to be widely used in the analysis person's features for correcting diet and feeding behavior. Presented data can be used to establish national standards in the physical development of Kyrgyz female persons. The current data can be introduced in creating a database for the Kyrgyz national group.

Limitations

Our research is local to the observed phenomena and the associated lower chance of a sweeping generalization of the results.

Statements

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