

Height and Some of the Body Proportions by the Vision of Artistic Anatomy

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In this study, we tried to examine the body proportions of Turkish woman according to artistic anatomy and how the change of length values of the parts that form the body effect the body height.

541 male students who had no orthopaedic and physical defect and educating in Trakya University Medical Faculty took place in our study. The Harpender anthropometer was used in measurements. The measurement distances, mean values, standard deviations, proportions to body height and correlation coefficients in our study are like this respectively: **1) Basion-vertex (body height):** $173,67 \pm 5,34$ **2) Basion-gnathion:** $149,40 \pm 4,94$, %86,01, 0,31, **3) Basion-acromion:** $143,36 \pm 5,8$ %82,54, 0,84, **4) Basion-suprasternale:** $141,50 \pm 4,76$, %81,25, 0,60, **5) Basion-thelion:** $127,27 \pm 4,33$, %73,29, 0,88, **6) Basion-omphalion:** $104,44 \pm 3,95$, %60,13, 0,87, **7) Basion-iliospinale:** $98,49 \pm 3,92$, %56,19, 0,83, **8) Basion-trochanterion:** $90,39 \pm 3,87$, %51,34, 0,78, **9) Basion-symphysis:** $88,40 \pm 3,34$, %50,70, 0,79, **10) Basion-gluteale:** $79,40 \pm 3,45$, %45,71, 0,81, **11) Basion-dactylion:** $64,64 \pm 3,48$, %37,21, 0,68, **12) Basion-tibiale:** $46,14 \pm 2,81$, %26,28, 0,58, **13) Basion-sphyrion:** $8,35 \pm 0,55$, %4,80, 0,22.

As a result, we could say that:Thigh length has much important effects on forming the body length, than the leg length. These results are compared with the data available in the literature.

Key words: Artistic anatomy, anthropology, proportion.

Introduction

For 5 thousand of years, the human body had been studied continually by artists and scientists. The artists, who use the human body as a narration symbol, had investigated the human anatomy by the vision of artistic anatomy thoroughly. They had accepted: Their work of arts like their pictures and statues have some proportions on human body. And they had used these proportions in their lots of evidence [1, 2].

The proportions between the different parts of the human body had been called CANON. And the unit measure of every canon had been defined as MODULE [1, 4, 6]. Artists had used different modules like foot length, hand length, head height and third finger length in different canons [8, 9].

The oldest canon which is in Egypt, accepts the foot length as module. From their graves and not-ended pictures in pyramids, we understand that the height of the human body is equal to six times of the foot length. However, some artists had accepted the foot length 1:7 of the body height. But on the new Egyptian Canon, the module is the third

finger length of the hand. As humanity history develops, lots of artists had defined different canons in their own cultural and social comprehension [5, 10].

In 19th Century, with the Schmidt-Fritsch Rule, which was planned by Schmidt and developed by Fritsch, anthropometric methods were used. This rule explains the anatomical structure of human body with mathematical expressions. According to the rule, from a portion of the human body, the other parts could be determined. The proportions between the portions of human anatomy was scientifically defined by Dr. Paul Richer for the first time [1, 2, 4, 8].

With this study, we purposed to examine some of the human body proportions on Turkish male adults by artistic anatomy. We searched the orientation points mentioned in canons, the levels according to body height of a man figure standing up right, commission parts from the base line. And the most important thing, that we consider, is how much effects portions that constitute the human body on the body height.

Material and Methods

We made this study on 541 male students of Trakya University Medicine Faculty. Our subjects have not any physical or orthopedic defects. We did not care race, lineage and religion. Only, representing Turkish male was sufficiently for us. We used Harpender anthropometer for our measurements. Findings were recorded to the view that we made at first. Arithmetic average, standard deviation and correlation analysis were checked.

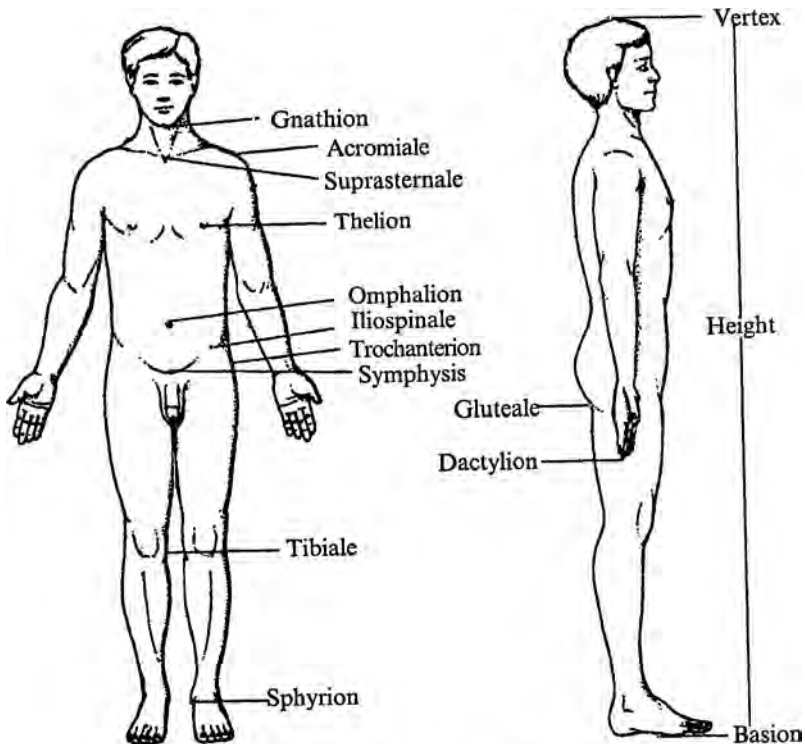


Fig. 1. Anthropological points

The aim of our research is not the averages of body height of subjects or metric values of some of the body portions. Our aim is to create the correlation between height and the proportions that constitute the height. We got benefit from classical known anthropological locations for a standard measurement. And we added some superficial locations which didn't use anthropometry but are preferred in plastic anatomy [7, 11].

On normal anatomical position, the distance between anthropological spots and sole was compared (Fig. 1). 1-Vertex 2-Gnathion 3-Acromion 4-Suprasternale 5-Thelion 6-Omphalion 7-Iliospinale 8-Trochanterion 9-Symphysis 10-Gluteale 11-Dactyion 12-Tibiale 13-Sphyron [11].

Findings

The average values and determined ratios of our study on young Turkish men are shown in table 1 by using per cent.

And the correlation analysis between our subjects' height and proportions that constitute the height is shown in a shape of diagram (Table 2).

Table 1. The average values and determined ratios of our findings

Features	min	max	mean	SD(±)
Boy	148.00	194.00	173.67	5.34
B-Gn	129.50	168.00	149.40	4.94
(B-Gn/body height)*100	79.94	86.60	86.01	0.33
B-Acr	100.00	180.00	143.36	5.08
(B-Acr/ body height)*100	67.57	92.78	82.54	0.60
B-St	119.00	160.00	141.10	4.76
(B-St/ body height)*100	80.41	82.47	81.25	3.68
B-Ma	107.00	145.00	127.27	4.33
(B-Mam/ body height)*100	74.66	74.74	73.29	3.32
B-Um	85.00	124.00	104.44	3.95
(B-Um/ body height)*100	57.43	63.92	60.13	0.48
B-Sp	80.00	112.00	98.49	3.92
(B-Sp/ body height)*100	54.05	58.95	56.19	5.73
B-Tro	74.00	104.00	90.39	3.87
(B-Tro/ body height)*100	50.00	54.88	51.34	6.23
B-Sy	72.00	100.00	88.40	3.34
(B-SY/ body height)*100	48.65	51.81	50.70	3.27
B-Gul	64.00	93.00	79.40	3.45
(B-Gul/ body height)*100	43.24	47.94	45.71	0.60
B-Acm	50.50	78.00	64.64	3.48
(B-Acm/ body height)*100	34.12	40.21	37.21	0.90
B-Tib	37.00	57.00	46.14	2.81
(B-Tib/ body height)*100	25.00	29.38	26.28	2.80
B-Sph	5.50	15.00	8.35	1.15
(B-Sph/ body height)*100	3.50	7.73	4.80	0.55

Table 2. Correlation analysis between our subjects' height and proportions that constitute the height and the comparison of our findings with the literature data

Leonardo, Dürer	Paul Richer	Our Study	Correlation	Vertex	
100	100	100		Gnathion	
87,5	86,7	86,01	0,31	B-Gn	0,31
****	****	82,54	0,84	Acromiale	
				B-Acr	0,84
83,0	****	81,25	0,60	Suprasternale	
				B-St	0,60
75,0	73,4	73,29	0,86	Thelion	
				B-Th	0,86
****	60,1	60,13	0,87	Omphalion	
				B-Omp	0,87
****	****	56,19	0,83	Əliospinale	
				B-Sp	0,83
****	****	51,34	0,78	Trochanterion	
				B-Tro	0,78
50,0	****	50,7	0,79	Symphysion	
				B-Sy	0,79
****	46,8	45,71	0,81	Gluteale	
				B-Glu	0,81
****	****	37,21	0,68	Dactylion	
				B-Dac	0,68
25,0	26,7	26,28	0,58	Tibiale	
				B-Tib	0,58
****	****	4,8	0,22	Sphyrion	
				B-Sph	0,2

Discussion

Body height of the human beings and the proportions of their body parts change according to the geographical region that they live in, their race and nourishment styles [3, 5].

Today artists, but also a lot of scientists make studies on human body. At the same time, esthetics and forensic medicine have progressed on the term.

Our subjects' average height is: 173.67 cm. And height changes according to the changes in social and economic conditions. However, proportions could be changed. Our proportions are harmonious with those of Paul Richer (1920), who has studied contemporary Europeans, rather than the archaic epoch (Polykleitos) and Renaissance Period (Leonardo, Dürer). Besides, the olden famous artists had had a search of ideal artistic models. But Paul Richer preferred to evaluate a real, alive average European type by scientific methods [1].

The most important point of our view is the effects of the parameters that form the body length. We searched the correlation between the average values of the body portions and the average height. And as a result, the most important parts that effect the height are amillar, umbilical, gluteal, symphysis, trochanterion, spinale and acromion heights.

4.80% of average body height made of Sphyrion height and 86.01% of average body height made of Gnathion height haven't any correlation with body height. We

could explain this with the augmentation of the head heights of Turkish men. The upper and lower points (sphyrion, gnathion) haven't a direct correlation with the body length. Because of that, it's impossible to evaluate the foot height and head height with the height of human beings. Tibiale and suprasternale that are close to these points, have not a strong relation too. But the middle parts of the body height (omphalion, thelion), which are soft tissues, have the best relation. Acromiale, that joins the upper extremity and iliospinale that joins the lower extremity, may be safe criterions. Dactylion which shows the length of upper extremity and Trochanterion which is about lower extremity have a poor relation index. In the past, Gluteale, which had been determined by Paul Richer, is rather a safe point, and it has a good relation with the body height.

As a result, we could say that: Thigh length has much important effects on forming the body height, than the leg height.

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