The Investigation of Childrens Anthropometric and Motoric Attributes According To Their Ages

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ABSTRACT

Anthropometric and motoric attributes which are leading the criteria of talent are seen as the pre-condition for talent identification. It is important to identify in advance and follow-up the potential to develop the high-level yield. To identify the anthropometric attribute is important for the performance of the athlete's training. Observing changes of motoric attribute in the characteristics of age and gender for talent selection and direction is crucial in order to determine which education program should be used. The purpose of the study is to investigate anthropometric and motoric attributes of children between the 7-15 years of age. The research group is selected of 1142 children from different provinces. The body mass index, height, weight, flexibility, hand grip, vertical (squat) jump, kneeling medicine ball throw for arm strength and 20 m sprint of the research group have been identified. Mean and standard values or the data obtained from the research group were calculated according to age and gender. In order to compare some of the motoric attributes by age and gender the data is converted into Standard scores. According to the data obtained from the motoric attributes of the research group the boys between 7 and 11 years of age are superior to the girls, at the age of 12, they have values close to each other. At the age of 13 the superiority of boys is increasing and as they are 15 years old they reach the highest level. According to the findings, the change status of girls and boys in adolescence affects the motoric attributes. It has been identified that in all age groups some of the motoric attributes of the boys are superior to girls.

Keywords: *adolescent, anthropometric, motoric attribute*

INTRODUCTION

Anthropometric and motoric attributes which are leading the criterions of talent are seen as the pre-condition for talent identification. It is important to identify in advance and follow-up the potential to develop the high-level yield.

To identify the anthropometric attribute is important for the performance of the athlete's training. Observing changes of motoric attribute in the characteristics of age and gender in talent selection and direction is crucial in order to determine which education program should be used. The purpose of the study is to investigate anthropometric and motoric attributes of children between 7-15 years of ages.

METHODS

Research Group

The research group is selected of 1142 children from different provinces. The body mass index (BMI), height, weight, flexibility, hand grip (HG), vertical (squat) jump (SJ), kneeling medicine ball throw (MBT) (age 7-12 1 kg., age 13-15 2 kg.) for arm strength and 20 m sprint of the research group have been identified.

Data Collection Tool

The body mass index and height of the subjects were measured while they were on bare feet and with minimal clothes by a 0.01 kg and 0.01 m. stadiometer with accuracy. Flexibility test stand used for the measurement is 35 cm. long, 45 cm wide and 32 cm. high. Dimensions of the upper surface of the stand are 55 cm. long and 45 cm. wide. The upper surface is 15 cm more outside than the feet which based on the surface. To measure the HG a Baseline brand hand dynamometer was used. For the SJ measurement jump mats developed by Fusion Sport Smart Jump have been used. For the Speed measurements the Fusion Sport brand SMARTSPEED photocell device were used for.

Data Analysis

The mean and standard deviation value data obtained from the research group were calculated according to age and gender. Some motor characteristics like age and sex were converted into standard scores in order to compare the data. The height, body weight, the average and standard deviation values of some of the motoric features of the research group have been identified. For data analysis SPSS 17.0 software package was used. For the significance 0.05 level was adopted.

FINDINGS

Standard scores according to the scores obtained by the research group, the mean and standard deviation values are given in the tables. The findings of the research, the standard score (T-score) values are converted according to the values given in table 1 for the comparison of boys and girls.

Table1. A comparison of the values obtained from the boys and girls of the research group converted into a standard score (T-score):

Age	n	Boys	Girls	Difference
7	34	40,91	39,34	E>K
8	55	42,87	41,39	E>K
9	60	44,78	42,97	E>K
10	67	47,50	44,76	E>K
11	113	49,12	47,87	E>K
12	127	51,1	51,95	K>E
13	97	54,09	52,13	E>K
14	74	55,62	53,37	E>K
15	52	58,88	53,30	E>K

Table 1 shows that according to the data obtained from the research group boys of age 7 until 11 are more superior than the girls, at the age of 12 it is determined to have values close to each other. At the age of 13 the superiority of the boys increases and reaches its highest level at the age of 15.

The obtained values of the research group and the mean and the standard deviation according to stature, body mass, flexibility, HG, SJ, BMI, MBT for arm strength and 20 m. speed are given in Table 2.

Table2. The mean and the standard deviation values according to stature, body mass, flexibility, HG, SJ, BMI, MBT for arm strength and 20 m. speed.

Age	Sex		Stature (cm)	Mass (kg)	Flexibility (cm)	HG-Right (kg)	HG-Left (kg)	SJ (cm)	BMI (kg/m^2)	MBT (cm)	20 m (sec)
7	BOY	Mean	121,2970	25,0264	23,0000	10,4783	9,3200	16,23	15,9697	236,9697	4,95
		SD	9,60942	8,21997	4,68025	3,32852	3,02379	3,06	3,82005	85,09131	,81
	GIRL	Mean	116,2192	21,2088	22,7438	8,4286	8,2857	15,14	15,5769	206,7308	5,15
		SD	5,38338	3,15647	4,12439	1,93834	1,67758	2,49	1,90101	52,07576	,64
8	BOY	Mean	124,7685	25,3569	21,8947	12,4412	11,8529	17,03	15,1296	240,9091	4,71
		SD	7,54663	5,21388	6,18101	2,98675	2,82984	3,70	4,20712	60,16252	,59
	GIRL	Mean	123,4938	25,0494	22,9750	10,8421	10,5556	16,19	15,6563	239,8437	4,95
		SD	5,05613	3,83583	5,96054	2,75405	2,89466	5,87	3,57057	67,03976	,65
9	BOY	Mean	130,8407	28,5747	18,6591	16,2162	12,8649	17,92	15,7119	296,0345	4,50
		SD	6,91291	5,06804	7,06841	20,01962	3,69806	4,20	3,42431	94,23635	,35
	GIRL	Mean	130,6175	29,8863	23,3423	11,6000	11,5806	16,59	17,1250	285,0000	4,80
		SD	7,37619	7,01875	8,89036	3,39980	3,80153	3,89	2,62324	68,64999	,46
10	BOY	Mean	135,6940	32,9216	19,9896	15,3953	14,9149	19,44	16,3284	362,0152	4,33
		SD	10,53775	9,39850	7,25412	4,63496	4,14849	4,21	5,03138	100,20525	,37
	GIRL	Mean	133,2489	31,2971	21,8182	14,2424	13,2424	17,72	17,0667	309,2045	4,59
		SD	8,30273	6,86549	7,58784	4,18353	4,11575	4,21	2,53521	102,05985	,45
11	BOY	Mean	140,4434	37,6650	22,4939	17,6092	16,6591	19,35	18,3602	407,0202	4,32
		SD	8,58755	10,54704	8,07239	4,03288	3,67622	3,88	4,54693	113,63637	,45
	GIRL	Mean	142,3506	38,5010	26,2250	16,9067	16,4730	18,50	18,4045	377,7397	4,39
		SD	8,48543	9,63802	7,86851	4,85513	4,42355	4,43	3,44344	120,67530	,43
12	BOY	Mean	145,2120	39,6033	23,5000	19,7087	18,6038	21,13	17,8480	461,4673	4,22
		SD	8,72302	9,84420	8,69374	4,91822	4,64487	4,77	4,00817	106,96802	,63
	GIRL	Mean	147,7500	42,3502	27,3913	19,7500	19,3000	19,80	18,8750	448,2692	4,30
		SD	7,76157	7,80153	7,12968	4,82183	4,27260	5,14	2,95200	112,76770	,36
13	BOY	Mean	152,8789	45,5092	22,2306	25,1146	23,3639	23,12	18,6737	417,9747	3,96
		SD	9,42762	10,78175	8,26289	6,97127	6,68439	4,20	2,96591	107,42475	,35
	GIRL	Mean	152,1620	47,8730	27,2353	23,0333	22,2364	19,49	19,7606	399,7273	4,31
		SD	8,36150	9,25105	9,06441	6,25600	4,68237	4,22	4,19341	121,40923	,42
14	BOY	Mean	156,8352	48,8616	22,8000	26,6944	26,0694	23,84	19,2338	455,2703	3,90
		SD	8,61651	10,47954	9,12237	7,00430	6,64667	4,49	3,03804	109,74407	,56
	GIRL	Mean	154,9255	53,4652	29,5538	25,4079	24,3231	18,90	21,7021	428,1395	4,18
		SD	6,88093	9,92092	8,69406	5,47280	4,61088	4,35	3,66484	76,61766	,40
15	BOY	Mean	161,7729	53,2500	25,1633	31,4510	30,2549	25,70	18,7271	518,0980	3,64
		SD	11,36064	12,63958	9,12445	8,65174	8,28696	6,13	6,42706	148,70538	,31
	GIRL	Mean	154,6690	55,3023	30,8500	25,7436	25,7027	19,34	22,8857	404,7619	4,40
		SD	8,91840	11,96406	7,27792	6,16321	4,61799	4,51	6,39533	117,26015	,43

Table 2 shows that for boys and girls the performance values are increasing together with the increasing age.

DISCUSSION

Children till the age of 10 have the similar physical structure. After 10 the male and female hormones changes in their body and are increasing so the sexual difference rises. On the other hand in several studies it is mentioned that girls thrive earlier than boys (Haslofça, 1998; Muratlı, 2003; Turgut & Çetinkaya, 2006). On this point of view it is

natural that, as it is shown in Table-1, girls at the age of 12 are better than the boys according to the t-points.

As the values in Table 2 are analyzed it is seen that they are parallel to similar studies. The foundings of Balcı and Tamer (2005) show following values; 6-11 aged boys and girls average boys of 7 years are about 125,3 cm, 8 years 128,6cm., 9 years 135,3cm., 10 years 140, 7cm and 11 years 148,5cm. In the same study for girls following values were identified; for 7 years 124,7cm, 8 years 129,7cm., 9 years 134,6cm., 10 years 139cm., 11 years 137,7cm. In the study of Pekel about 10-12 years old children following values were founded 10 years old girls 133,24cm., boys 134,7cm; 11 years old girls 140,1 cm., boys 139,7cm; 12 year old girls 146,2cm., boys 145,3cm. (Bayraktar et al., 2010). It has been determined that the data obtained from the study was parallel. The founding of Turgut and Çetinkaya (2006) for girls between 6-11 years of age had shown that 7 years old girls 123,7, 8 years old girls 131,1cm., 9 years old girls 136,2cm., 10 years old girls 141,6cm., 11 years old girls 145,0cm.

In Holland a research has been done through 200 children being 12 year old boys and girls. The percent values have been graded in five different groups. They are characterized as “low”, “lower average”, “average”, “over average” and “high”. In that classification the group of boys categorized as “low” are 152 cm. and less, “lower average” 153-156 cm, “average” 157-160 cm. and “over average” 166cm, another value classified as excellent is 166cm. and above. For 12 years old girls the “low” value is 153cm. and less, “lower average” 154-158 cm, “average” 159-162 cm, “over average” 163-166 cm., “high” 167 cm. and above (Mechelen et al. 1991). If we compare this study done in Holland with our study it is seen that the values from Holland are much better. But there are two important points. First even if the classes were selected randomly there is no information about whether they have done sport or not. Second different studies show that in countries with good socio-economic development the physical conditions of the people are always better (Akgün, 1997). So it is normal that values comparing Holland and some of our Turkish provinces show differences. According to another search done in Sweden with 225 girls at the age of 10 who don't do sport, the average body length have been shown as 139,7±6,3 cm. (Örjan et al. 2005).

The weight of the research group shows that 11 year old boys and girls are equal but after the age of 11 the girls are heavier than the boys. In a research from India it was shown in a group of 9-10 year old, 60 girls who they are about 31,34±6,79 kg., 11 years old 60 girls 35,03±8,88 kg., 12 years old 54 girls about 40,20±9,49 kg. (Mondal, 2006). These research results show parallel lines to our research. In the research of Balcı and Tamer (2005) for 6-12 year old children, the boys at the age of 7 are 27,1 kg., 8 years old boys are 26,4 kg., 9 years old boys are 30,8 kg., 10 years old boys are 35,9 kg, and 11 years old boys are 46,0 kg. In the same research the girls of age 7 have average 26,1 kg., 8 years old girls 29,0 kg., 9 years old girls 32kg., 10 years old girls 33,8 kg, and 11 years old girls 36,0 kg.

Turgut and Çetinkaya (2006) have done a research with a group of 6-11 year old girls in which it was founded that 7 are old girls are 25,2 kg., 8 years old 29,5 kg., 9 years old 32,5 kg., 10 years old 36,4 kg. and 11 years old 36,7 kg. In Pekel’s research of 10-12 years old boys and girls which are not do sport, the average values were founded for 10 years old girls are 19,7 cm, 11 years old girls are 18,2 cm., and 12 years old girls are 20,0cm. But for the boys 10 years old boys 17,3 cm., 11 years old boys 17,6cm. and 12 years old boys 18,4cm. (Bayraktar et al., 2010). In another research of Gül et. al. (2006) of a group 10-12 years old boys these average flexibility values of 10.7 cm was founded. In the same research the average values of right hand grip was 15,7 kg., but for left hand grip was 15,3 kg. In the normative study of Pekel for 10 years old boys the average value for right hand grip was 14,5 kg. and left hand grip 13,9 kg., 11 years old boys right hand 16,7 kg., left hand 16,0 kg., 12 years old boys right hand 19,2 kg., left hand 18,6kg. But for 10 years old girls right hand grip 13,5 kg., left hand 12,9 kg., 11 years old girls right hand grip 16,0 kg. left hand 15,3kg. and 12 years old girls right hand grip 18,2 kg., left 17,6 kg. (Bayraktar et al., 2010).

If we take a look to the values 10 and 11 years old boys and girls it can be seen that the measurements are parallel to each other. It is seen that after the age of 12 right hand grip of boys improve more than the girls. Some sources show us that after the age of 10 the hormonal excretion starts, and after the age of 11 these hormones are increasing (Haslofça, 1998; Muratlı, 2003).

Under the hormonal aspect there is no notable difference. Testosterone level is much lower than normal people. Testosterone level for boys is getting ten times higher before puberty but this level is much lower for the girls (Haslofça, 1998).

According to this fast increasing (Parallel to this the other hormones are increasing as well) gender differences are occurring.

These causes an increasing difference in the physical performance and anthropometric values between boys and girls. Especially the muscles mass of boys is enhancing (Weineck, 1987). This enhancement is leading to better performance according to strength variables for boys.

In a research Rachev (1979) did in Bulgaria with 10-11 years old children seen as talented it was determinated that vertical jump value for 10 years old boys 36 cm., and for girls 32 cm., 11 years old boys 38 cm. and for girls 36 cm. (Coşan&Demir, 2005).

Gül et. al. (2006) founded in their study 10-12 years old children for the vertical jump average value 31,87cm. In Pekel's study for the 10 years old group the value 23,5 cm. was founded for 11 years 24,9 cm. and 12 years 26,5cm. But for the 10 years old girls 21,3 cm.,11 years 23,2 cm. and 12 years 23,9 cm. (Bayraktar et al., 2010). Turgut and Çetinkaya (2006) determined for 7 years old girls the average value 20,3cm., 8 years 24,2cm., 9 years 27,2cm., 10 years 29,2cm. and 11 years 31,4cm. in their study.

As the participant were evaluated according to the body mass index normally the values which are in balance until the age of 12 change after the age of 12. This situation is the one which is influencing physical performance and anthropometric values because of the hormonal changing as discussed above (Weineck, 1987).

Balcı and Tamer (2005) calculated these average values for 7 years boys 17,1kg/m^2, 8 years 15,9 kg/m^2, 9 years 16,8kg/m^2, 10 years 18,0kg/m^2. But for 7 years old girls 16,7kg/m^2, 8 years 17,0kg/m^2, 9 years 17,6kg/m^2, 10 years 17,4kg/m^2.

Pekel founded in his study for 10 years old boys 17,4kg./m^2, 11 years 18,1 kg./m^2 and 12 years 18,6 kg./m^2 but for 10 years old girls 17,3 kg./m^2, 11 years 18,0 kg./m^2, and 12 years 18,5 kg./m^2 (Bayraktar et al., 2010). In a research from Sweden on 221 non-athlete girls it was determined that the BMI for 10 years old 18,3±3,0 kg/m^2, but for 282 non-athlete boys the BMI 18,1±2,9 kg/m^2. Percentage of 25% value was 16,1 kg/m^2, average value 17,4 kg/m^2, 75% value was 19,4 kg/m^2 (Örjan, 2005).

In Pekel's normative study for kneeing medicine ball throw of 10 years old boys the average value was 471,5cm., 11 years 531,6cm., 12 years 579,1 cm. but for 10 years old girls 419,2cm., 11 years 481,9cm. and 12 years 543,8cm. (Bayraktar et al., 2010). Gül et.al. (2006) obtained for 10-12 years old boys the value of 614,8cm.

20 m which is known as the most important indicator speed as the given values are investigated the I.P.P.T.P. tests norms are divided in three groups. At the assessment which were defined as plus, neutral and minus were for 9-10 years old girls 4,5 sec. which is bad and lower, the neutral value is 4,2 sec. and the good and better value was 4,0 sec. The same graduation stays for the boys of 9-10 year old boys. As the 11-12 year old boys were investigated 4,4 sec. for the bad value 4,0 sec. neutral, 3,7 sec. best performance. For girls 4,3 sec. stands for bad performance, 4,0 sec. neutral, 3,8 sec. good performance (Kamar, 2003). Balcı and Tamer (2005) founded for 7 year old boys 5,09 sec., 8 year old boys 4,68 sec., 9 year old boys 4,76 sec., 10 year old boys 4,35 sec. In the same study it was founded for girls of 7 years old girls 5,45 sec., 8 years old girls 5,15 sec., 9 years old girls 5,39 sec., 10 years old girls 4,72sec. Turgut and Çetinkaya (2006) investigated that for 7 years old girls the average values are 4,94 sec., 8 years old 4,69 sec., 9 years old 4,56 sec.,10 years old 4,63 sec. and 11 years old 4,22 sec.

CONCLUSIONS

As a result; besides testing to effect on growing, improvement and health, physical and physiological tests for children were carried out in order to determine status analyze of children with sport specialists. According to the obtained founding the changes during the adolescent term affect on the motoric abilities of boys and girls. In all age groups it was determined that some motoric abilities of boys were higher than the abilities of the girls.

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