DETERMINATION OF THE DIFFERENCES IN ANTHROPOMETRIC CHARACTERISTICS, MOTORIC AND SPECIFIC MOTORIC ABILITIES OF YOUNG FOOTBALL PLAYERS AGED 12 TO 14 IN THE REPUBLIC OF NORTH MACEDONIA

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Abstract

Our research aims to determine the differences in anthropometric characteristics. Motor and specifically football motor skills in young football players from 12 to 14 years with different gender maturity in R.N Macedonia. The sample of athletes was subjected to transversal examination in anthropometric. Motor and specific motor abilities of young football players from the Polog region of North Macedonia. Based on MANOVA and ANOVA. It can be noticed that the athletes with different chronological ages of 12., 13., and 14 years who do not belong to the same population are statistically significantly different (p= .00)., In the anthropometrical space, we found differences in six parameters; Height (p=.00).; length of left leg (p=.00); diameter of pelvis bitrochanter (p=.00); diameter of the knee joint (p=.00); diameter of ankle joint (p=.03); We found differences in boys with different chronological ages 12.13 and 14 statistically significant differences (p = .01). Based on the univariate analysis for each variable. It can be noticed that a statistically significant intergroup difference is present in five variables foot taping (p=.05); long jump (p=.00); the number of 20 meters starting from a standstill (p=.00); raising the torso for 30 seconds from lying on its back (p=.02); deep inclination from sitting (P=.04); 10X5 Shuttle run (p=.00); Illinois test without a ball (p=0.001); zig-zag test (p=0.001); Agility training (p= .00); Compass drill or agility cone started for. Right side (p= .00); Compass drill or agility drill started with left side (p = .00); Homemade agility test (p- .00); and Agility training (p = .00).

Conclusion: The organization of the competition system according to the gender maturation will bring an advantage to several segments of the youth football in N.Macedonia and they are: the competitions will more realistic, will be possible for children with the same anthropometric characteristic to compete, it will be possible to compete with children with almost the same motor skills, will bring a much more realistic picture of the current qualities of the players, designing realistic programs for talent development, real achieved results at the moment.

Keywords: Maturation, Motor Skills, Soccer, Competition, Body composition. Specific Motor skills

1. Introduction

With football being the most important side activity in our social life in the past time, we can freely say that it has become a huge industrial sector. The size and importance of this sector can be confirmed by the data that the European football market in 2006. amounted to 12.6 billion euros. (Deloitte, Annual Review of Football, May 2007).

Certainly the success of the football game depends on many anthropological abilities and peculiarities to which special attention should be paid. Of course, among them a special place is occupied by situational-motor skills, which largely determine the football game and deserve special attention in the training process of all, especially the young categories of players.

Elsner B.(1985) says: The situational-motoric abilities of the footballer, defined as the most rational, most expedient and most thoughtfully performed motor tasks with and without the ball, realized in various situations of the game are a synthesis of basic motoric skills, technique and tactics of football. "The realization of the

structural units, the structural situations, the game in the phase of attack and defense, as well as the game as a whole, depend on them."

Therefore, the situational-motoric skills of the football player are the foundation of the football game and have been the subject of wider research lately.

A transversal examination of the anthropometric, motoric and specific motor abilities of the young football players from the Polog region of the Republic of Macedonia was performed on the sample of respondents.

The purpose of this research is to determine the differences in anthropometric characteristics, motoric and specific motor skills in young football players from 12 to 14 years with different gender maturity in R. North Macedonia.

The results of this study could provide useful information for sports officials in order to create battery of tests with valid metric characteristics which will enable systematic monitoring of conditions, their development component and prediction of conditions on time.

2. Methods

Participants

The study was performed in the Polog region of the Republic of North Macedonia on 101 respondents aged 12-14 years, members of the pioneer and cadet teams from the first and second Macedonian football league who are in regular training and competition process from the football clubs FC.Drita from Bogovinje, FC. Renova, FC. Teteks, and FC. "Shkendija" based in Tetovo.

Prior to the initiation of the tests, the purpose and procedures were explained to all the footballers. Data were confidential and data protection was observed.

Sample of variables

In this research were applied 36 variables: 14 anthropometric variables for estimating the morphological status of football players as vary: height, length of right arm, length of left arm, pelvic diameter, the diameter of the knee joint, ankle diameter, thigh circumference, calf circumference, weight, body mass index, skin fold on the back – subcapsular, skin fold on the lower leg – calf, skin fold of the upper arm – triceps, skin fold of suprailiac.8 variables for estimating motor abilities as vary: foot taping, long jump, fast running 20 meters starting from the place, raising the torso for 30 lying on its back, hanging with bend with a scroll, horizontal posture of the torso, flamingo test, deep incline with sitting. 14 variables for estimating specific motor skills vary 10 x 5м shuttle run, Illinois test, Illinois test, zig-zag test, T-test, compass drill or agility cone right, compass drill or agility cone left, quadrat jump test, quadrat jump test,505Agility test, hexagon agility test, hexagon agility test, homemade" agility test, agility training. Participants` height, length of arms and legs were measured to the nearest 0.1 cm with a Martin anthropometer, thigh circumference and calf circumference were measured to the nearest 0,1 cm with a metal meter, weight was measured to the nearest 0,5kg with a transportable scale, pelvic diameter and diameter of the knee joint were measured to the nearest 0,1 cm with pelvimeter and ankle diameter was measured to the nearest 0,1 cm with a slippery compass. Harpenden skinfold calliper was used to take skinfold thickness to 0.1 mm. Maturity was measured by Tanner, J.M. (1989) stage manual Personal information of the participants (full name, date of birth, activity record) as well as anthropometric data.

Statistical analysis of the obtained results was made using the statistical program for Windows, SPSS 15. Descriptive statistics including mean values, standard deviations, coefficient of variability,minimum and maximum values were used for series with numerical attributes.

3. Results

In the area of descriptive statistics, for all applied tests in all respondents together, separately for each test the basic measures of the central tendency are calculated: arithmetic mean (X) - as the average value of all results, minimum result (Min.)maximum result (Max.) - as indicators of variation width of results,(Std. Dev.) - as the most important indicator for absolute deviation of the results from the arithmetic mean, Skewness - a measure of deviation in symmetry, Kurtosis - Kurtosis - a measure of vertical deviation.

Table1. Basic statistical indicators of the variables for estimating the anthropometric status of all respondents (N = 101) included in the research.

	N	MEAN	MIN.	MAX.	STD.DEV.	SKEW.	KUR.
AVIS	101	153.47	132.20	186.00	9.86	.70	**.85**
ADLR	101	69.37	59.00	97.00	6.77	1.71	**4.47**
ADLN	101	93.38	75.20	110.00	6.63	.14	**.27**
AONK	101	44.57	35.10	55.80	4.12	.39	**-.13**
AOPK	101	31.63	25.60	39.50	2.90	.53	**.16**
ATTM	101	44.33	27.50	79.20	9.92	1.12	**1.42**
ABMI	101	18.59	14.33	26.76	2.42	1.15	**1.26**
ADKBT	101	24.47	20.60	32.00	1.96	.55	**.93**
ADZK	101	9.71	7.80	12.50	.80	.52	**.78**
ADSZ	101	6.89	5.50	8.10	.43	.33	**.91**
AKNG	101	7.14	3.00	26.00	4.23	2.58	**7.05**
AKNP	101	15.43	7.00	30.00	4.97	.74	**-.00**
AKNN	101	8.99	4.00	22.00	4.21	1.43	**1.62**
AKNS	**101**	**9.42**	**4.00**	**30.00**	**6.23**	**1.87**	**2.71**

Positive signs indicate that the results are moving towards lower values, it shows that the majority of respondents have a smaller amount of fat tissue (less adiposity), which in this case is positive because increased ballast is considered negative, especially in football where it is needed high speed and agility.
Kurtosis values range in normal distribution values below 2.75 in all variables except variables ADLR 4.47 (left arm length) andAKNG 7.05 (subcutaneous skin fold of the back), where the values are higher than normal, which indicates an increased concentration of results around the mean values, of reducing discrimination. From the aspect of (Std. Dev.), they are the most homogeneous in the variable. ADSZ (diameter of the ankle) and most vary or deviate in the variable ATTM 9.92 (bodyweight), this is expected because the respondents do not belong to the same populations.

Table 2. Basic statistical indicators of the variables for estimating the motor status of all respondents (N = 101) included in the research

	N	Mean	Min.	Max.	Std.Dev.	Skew.	Kur.
MTN	101	28.87	23.00	35.00	2.88	.08	**-.72**
MSDM	101	161.90	120.00	220.00	20.61	.14	**-.12**
MBT20	101	3.76	3.17	4.44	.25	.03	**-.15**
MPTLG	101	19.64	12.00	26.00	2.71	-.47	**.19**

MVZN	101	16.92	3.04	58.88	11.71	1.32	**1.72**
MHDT	101	40.85	3.42	117.40	18.40	.89	**1.96**
MFT	101	13.74	3.00	23.00	4.32	.01	**-.49**
MDPS	**101**	**23.58**	**8.00**	**39.00**	**6.42**	**-.02**	**-.13**

Table 3. Multivariate (MANOVA) and univariate differences (ANOVA) in the anthropometric space between players of different chronological ages (12, 13 and 14)

WILKS' LAMBDA	RAO'S R	DF 1	DF 2	P-LEVEL
.52	2.36	28	170	.00
VARIABLES	Mean sqr Effect	Mean sqr Error	F(df1,2) 2,98	**P-LEVEL**
AVIS	1248.28	73.65	16.95	**.00**
ADLR	130.42	44.10	2.96	**.06**
ADLN	332.39	38.10	8.72	**.00**
AONK	7.31	17.21	.42	**.66**
AOPK	17.47	8.24	2.12	**.13**
ATTM	520.01	89.73	5.80	**.00**
ABMI	.24	5.96	.04	**.96**
ADKBT	27.78	3.35	8.29	**.00**
ADZK	3.52	.59	5.98	**.00**
ADSZ	.66	.18	3.69	**.03**
AKNG	5.49	18.13	.30	**.74**
AKNP	19.59	24.79	.79	**.46**
AKNN	43.31	17.17	2.52	**.09**
AKNS	**6.19**	**39.53**	**.16**	**.86**

Table 4. Multivariate (MANOVA) and univariate differences (ANOVA) in the specific-motor space between football players of different gender maturity (from 1-5 Sport Tanner)

WILKS' LAMBDA	RAO'S R	DF 1	DF 2	P-LEVEL
	Mean sqr Effect	Mean sqr Error	F(df1,2) 4,96	**P-LEVEL**
MASHR	3.94	2.44	1.61	**.18**
MAITBT	2.40	1.39	1.72	**.15**
MAITST	9.22	8.07	1.14	**.34**
MAITRZ	5.41	6.64	.82	**.52**
MAZZT	3.27	2.24	1.46	**.22**
MATT	1.94	.90	2.16	**.08**
MACDACD	.28	.41	.69	**.60**
MACDACL	.88	.41	2.14	**.08**
MACDACR	.09	.11	.83	**.51**
MAQJTD	14.23	8.98	1.58	**.18**
MAQJTL	12.05	14.10	.85	**.49**
MAQJTR	9.96	5.16	1.93	**.11**
MA505AT	.04	.05	.84	**.50**
MAHATD	13.51	5.31	2.55	**.04**
MAHATL	8.37	5.48	1.53	**.20**
MAHATR	1.05	1.09	.97	**.43**
MAHMAT	4.32	1.95	2.22	**.07**
MAAT	**2.99**	**.68**	**4.38**	**.00**

Table 5. Multivariate (MANOVA) and univariate differences (ANOVA) in the specific-motor space between the football players born in different quarter of the year (from 1-4)

WILKS' LAMBDA	RAO'S R	DF 1	DF 2	P-LEVEL

	MEAN SQR EFFECT	MEAN SQR ERROR	F(DF1,2) 3,97	P-LEVEL
MASHR	2.36	2.51	.94	.42
MAITBT	.74	1.46	.51	.68
MAITST	13.94	7.94	1.76	.16
MAITRZ	11.96	6.42	1.86	.14
MAZZT	3.18	2.25	1.41	.24
MATT	.46	.96	.48	.70
MACDACD	.69	.40	1.73	.17
MACDACL	.26	.43	.60	.61
MACDACR	.08	.11	.70	.56
MAQJTD	3.79	9.36	.41	.75
MAQJTL	7.17	14.23	.50	.68
MAQJTR	11.08	5.18	2.14	.10
MA505AT	.03	.05	.68	.56
MAHATD	1.70	5.76	.30	.83
MAHATL	12.51	5.38	2.32	.08
MAHATR	.54	1.10	.49	.69
MAHMAT	.61	2.09	.29	.83
MAAT	.40	.79	.51	.68

Table 6. Multivariate (manova) and univariate differences (anova) of variance in some variables of specific motor abilities in all respondents

	MEAN SQR EFFECT	MEAN SQR ERROR	F(DF1,2) 2,98	P-LEVEL
MACDACD	2.47	.36	6.78	.00
MACDACL	2.43	.39	6.27	.00
MACDACR	.07	.11	.64	.53
MAQJTD	15.00	9.07	1.65	.20
MAQJTL	35.18	13.58	2.59	.08
MAQJTR	1.30	5.44	.24	.79
MAHATD	13.18	5.48	2.41	.10
MAHATL	11.64	5.47	2.13	.12
MAHATR	.20	1.10	.18	.83

4. Discussion

The theoretical and great importance of the research can say that in our countries several studies can serve to conceptualize a valid theoretical-practical model for monitoring the physical development, physiological maturation and motor skills of young players. In this context, in this research, we will seek answers to some questions in terms of how and in what way anthropometric parameters, physiological maturation and motor

abilities can be sent and as specific motor agile coordination abilities of young football players in general. In this way, it will be possible to find and scientifically confirm an appropriate battery of tests with valid metric characteristics which will enable systematic monitoring of conditions, their development component and prediction of conditions in time. The battery constructed in this way will allow us to make our state norms and criteria, which will allow all future young football players to be sent for a longer period of time.

By all means, the obtained data will be of great importance in comparing them with some previous results of a similar or the same population both in the country and abroad. In this context, the data will be of great importance as a starting point for the situation of young players in the field of their morpho-functional and motor abilities, and thus the relevant institutions in the country, and above all FFM will be able to have a realistic picture of can undertake certain activities and measures for proper planning in the area of development of youth football in the country. Based on the results obtained from the statistical processing of this research, the following conclusions can be determined:

The main goal was to determine the differences in anthropometric characteristics, motor and specifically motor skills in young football players from 12 to 14 years with different gender maturity in R. North Macedonia. Statistically significant differences in anthropometric characteristics between young football players aged 12 to 14 were identified;

- Statistically significant differences in motor skills between young football players from 12 to 14 years of age have been identified;
- Statistically significant differences in specific motor skills between young players from 12 to 14 years of age have been identified;
- Statistically significant differences in anthropometric characteristics between young football players of different physiological maturity have been established;
- Statistically significant differences in motor skills between young players of different physiological maturity have been identified;
- Statistically significant differences in anthropometric characteristics, motor and specifically motor abilities in young football players from 12 to 14 years old with different physiological maturity have been uncovered. Based on the multivariate and univariate analysis of the variance MANOVA and ANOVA, it can be noticed that the respondents with different chronological ages 12, 13 and 14 years who do not belong to the same population are statistically significantly different in the studied multivariate space which gives a level of significance of $p = .00$.
- Statistically significant differences in specific motor skills between young players with different physiological maturity have been identified.

Based on the univariate analysis for each variable separately it can be noticed that there is a statistically significant intergroup difference in six variables body height at the level of $p = .00$ length of the left leg at the level of $p = .00$, the weight of bodyweight of the level of $p = .00$, the diameter of the pelvis - bitrohanteric at the level of $p = .00$, the diameter of the knee joint at the level of $p = .00$ and diameter of the ankle joint level of $p = .03$ of the fourteen applied manifest variables. This data indicates that competition is constructed established on chronological age criteria based on the English and Scandinavian leagues could be recommended, which would enable the natural development of the players, i.e a more realistic competition. Statistically significant differences in motor skills are present among young people. Based on the multivariate and univariate analysis of the variance MANOVA and ANOVA, it can be noticed that the respondents with different chronological ages of 12, 13 and 14 years who do not belong to the same population are statistically significant. Differing in the researched multivariate space, give a level of significance of $p = .01$. Based on the univariate analysis for each variable, it can be noticed that a statistically significant intergroup difference is present in five tapings with a foot at level $r = .05$, long jump, from place to level $r = .00$, fast running on 20 meters starting from the place, at the level of $r = .00$ raising the hull for 30 sec. from lying on your back at the level of $p = .02$, deep inclined from sitting at the level of $p = .04$. At present, statistically significant intergroup differentiation in eight 10X5 Shuttle Run $p = .00$, Ilionis test without ball $p = 0.001$, zig ag test $p = 0.001$,

Agiliitu Training p = .00, Compass drill or agility cone started on the right side p = .00, Compass drill or agility cone started from the left side p = .00, Homemade agility test p = .00 and Agiliitu training p = .00 from the eighteen applied manifest variables from this we can conclude that in the specific motor tests which by the nature of the performance is more complex and requires more concentration and strength and endurance, there is a difference between the age groups, while the other tests do not show a statistically significant difference. There are statistically significant differences in anthropometric characteristics between young players with different physiological maturity. Based on the univariate analysis for each variable presented separately, it can be noticed that there is a statistically significant intergroup difference in ten variables body height, left arm length, left leg length, thigh circumference, lower leg circumference, body weight mass, body mass index, bitrohanteric pelvic diameter, knee joint diameter and ankle diameter. There are statistically significant differences in motor skills between young players with different physiological maturity. Based on the univariate analysis for each variable, it can be especially noted that there is a statistically significant intergroup difference in five-foot taps, distance jump, several running 20 meters from the start and lifting the hull in 30 seconds. from lying on your back, deeply inclined from sitting. Regarding the specific motor skills among young football players with different physiological maturity based on the univariate analysis for each variable, there is a statistically significant intergroup difference in eight 10X5 Shuttle Run p = .00, Ilionis test without ball p = 0.001, zig ag test p = 0.00, Agility Training p = .00, Compass drill or agility cone started on the right side p = .00, Compass drill or agility cone started on the left side p = .00, Homemade agility test p = .00 and Agiliti training p =. 00 of the eighteen applied manifest variables. In the case of specific motor tests, the data obtained from the statistical processing where differences were found in eight tests out of eighteen refers to those tests where more complexity, adoption of movements, trained agility as well as a certain strength and endurance are made. footballers who train for a long time and partly those from the first and second quarters concerning the third and fourth quarters of the chronological year of birth.

5. Conclusion

The organization of the competition system according to the gender maturation will bring an advantage to several segments of the youth football in N.Macedonia and they are: the competitions will more realistic, will be possible for children with the same anthropometric characteristic to compete and it will be possible to compete with children with almost the same motor skills, it will be possible for children with almost the same specific motor skills to compete, will bring a much more realistic picture of the current qualities of the players, designing realistic programs for talent development, real achieved results at the moment.

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