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Original scientific paper

THE INFLUENCE OF SPECIFIC-MOTOR ABILITIES ON ANTHROPOMETRIC CHARACTERISTICS IN 13 YEAR OLD STUDENTS

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Abstract

Purpose: This paper explores the influence of specific - motor abilities on latent anthropometric dimensions of the body. The purpose of this research is to establish connection between specific - motor abilities as prediction system and latent anthropometric dimension as parameters criteria. Methods: The research has been conducted with 60 male aged 13 ± 6 months, in primary school "Bajram Shabani" - Kumanovo. The study used 30 variables of which 13 variables for assessment of specific - motor compartment, and 17 variables for assessment of Anthropometric characteristics. Based on the results of the regression analysis, where thirteen variables as predictor variables have been taken for assessment of specific motor compartment, whereas, as criteria seventeen variables have been taken. With the application of factor analysis, it is determined the structure of specific motor variables and Anthropometric variables in latent space, and the extracted factors are presented as a system of prediction variables and using regression analysis is determined the influence of criteria variables. Results: Based on the analysis of the results, it can be concluded the following: variables of specific motor abilities (such prediction system) have a statistically significant impact on Anthropometric variables (such criteria variables). The variables of specific motor skills (such prediction system) have statistically significant in variables AF1 (first anthropometric factor – factor of volume and skin folds) and AF2 (second anthropometric factor – factor of longitudinal dimensionality of skeleton), on significance level of 0.045 or 0.027. Conclusion: This means that with the application of these specific-motor tests, we can expect a proper development of functional and motor abilities among students, as well as, it has a positive influence in the development of the whole anthropological status.

Keywords: students, anthropometry, motor abilities, impact factor analysis, regression analysis

1. Introduction

Recently, a large number of professional and scientific papers are oriented in confirming the anthropological dimensions of space especially in anthropometric and bio motor which shows that they directly affect the achievement of sports results. To develop these dimensions properly, it necessary to plan and program the work to harmonize the individual traits and characteristics of children and youth.

According to this, teachers of physical education, with maximum use of their knowledge and experience, should encourage the development of anthropological performance of children and youth (Janevska, 1995). To reach this goal, it is required that teachers have professional knowledge, knowledge in the area of methodology.

With this approach, the information received from measuring instruments will contribute to prove which of these processes will bring the required intention.

Educational process of physical education classes has an important role in the formation of the personality of the students (Kondric et al., 2002; Stankovic et al., 2009; Georgiev et al.2012; Iseni, 2014) also has a complex impact on the anthropological status of students. As general tasks of physical education according to (Radic & Simeonov, 1997, 2006, 2009, 2013), it is aiming to improve and strengthen the health of students and increasing health education, increasing the volume and level of motor information, proper development of functional and motor skills, learning the aesthetic values etc.

The development of motor skills in humans is a very complex system, with the greatest development observed in the early period. Motor skills represent an integrated result in bodily functions and can be used to evaluate the efficacy of physical education related to children's health in schools. For these motor tests to have reliability and validity, researchers in the field of kinesiology refer to standardized tests such as: EUROFIT battery test (Adams et al., 1988); (Tomkinson et al., 2007); (KTK, Kiphart & Schilling, 1974), which has been applied in the testing of the coordination skills of children, the MOPER Fitness Test, adopted in the Dutch school (Leyten, 1982; Kemper & Verschur, 1995), etc. On the other hand, the measurement of anthropometric parameters allows for the monitoring of child psycho-physical growth, body composition, and sexual dimorphism (Kautiainet et al. 2002; Argyle, 2003; Wells, 2007; Krebs et al. 2008). BMI (body mass index) has no significant effect on motor fitness in children, whereas the sum of 5 subcutaneous adipose tissues has a negative association with speed in males aged 6–7 years and the length of jump in females aged 8–12 years old (Milanese et al. 2010). Brunet et al. (2007) study shows that BMI and subcutaneous adipose tissue have a negative correlation with physical fitness in children, especially with the long jump test. Simultaneous evaluation of anthropometric parameters and motor skills will provide more accurate information on the process of child development.

Starting from the main objective of the research, it is to determine whether certain specific motor skills-based on Anthropometric characteristics affect upon students of 14 years. The results of research of the influence of motor abilities on anthropometric characteristics have theoretical and practical value to the process of exercise among students because this research will give us new scientific information about the value of specific motor tests.

2. Methods

Sample of participants

The sample population derives from male students, aged 13 ± 6 months. The survey was conducted on 60 subjects in primary school "Bajram Shabani" – Kumanovo (n=60; height 168.17, weight 60.85, BMI 21.406). The sample in this research is indiscriminately about Anthropometric characteristics and motor abilities. The results of this survey will be taken only from participants who regularly attended classes in physical education and had participated in all tests.

Sample of variables

The study used 30 variables of which 13 for Assessment of motor skills or prediction parameters and 17 for assessment of Anthropometric characteristics or criteria variables.

Variables for assessment of Anthropometric characteristics are by numbers:

1. Height of body (AHB), 2. Length of hand (ALH), 3. Length of leg (ALL), 4. Length of thigh (ALTH), 5. Length of knee (ALK), 6. Diameter for shoulders (ADSH), 7. Diameter of knees (ADK), 8. Diameter of ankle (ADA), 9. Weight body mass (AWBM), 10. Perimeter of chest (APCH), 11. Perimeter of thigh (APTH), 12. Perimeter of knee (APK), 13. Body Mass Index (ABMI), 14. Skin folds of triceps (ASFT), 15. Skin folds of knee (ASFK), 16. Skin folds of thigh (ASFTH) and 17. Skin folds of stomach (ASFS).

Anthropometric variables were measured according to Internatioonal Biological Program (IBP) (Lohman, Roche & Martorell, 1988).

The variables for assessing motor skills are with numbers:

1. Tapping with the hand (MTH), 2. Tapping with the foot (MTF), 3. Tapping with the foot on the wall (MTFW),

4. Raising the trunk in 30 seconds from lying on your back (MRTLB30''), 5. Raising the trunk in 30 seconds Swedish case (MRTSC30''), 6. Push-ups (MPU), 7. Squats (MSQ), 8. Sit and reach (MSR), 9. Splits (MS), 10. Flash with stick (MFS), 11. Eight by tilting (MET), 12. 10 x 5m Shuttle run (M10X5) and 13. T-TEST (MTT).

Motor variables are chosen as representative of the size of the motor in the second line of research (Kurelič et al., 1975).

Method of processing data

In order to establish the connection between specific - motor variables as prediction system and Anthropometric variables such criteria system was applied regression analysis or the method of analysis of the impact and the relationship that belong to the group of multivariate analysis. The following two tables show the results of basic statistical parameter of criteria or prediction variables and measures of central tendency and dispersion for each indicator: 1. A minimum score, the maximum score, mean, standard deviation, and skewness and kurtosis, 2. Factor analysis of motor skills and Anthropometric characteristics and 3. Regression analysis. For data processing is applied a statistical package SPSS 22.0.

3. Results

The following two tables show the results of basic statistical parameters of criteria or prediction variables and measures of central tendency and dispersion for each indicator: 1. minimum score, maximum score, mean, standard deviation, and skewness and kurtosis.

Table 1. Descriptive statistical parameters for Anthropometric variables

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
AHB	60	150.50	179.60	168.1717	6.79032	-.374	-.062
ALH	60	64.00	82.00	73.4750	3.68228	-.434	.470
ALL	60	90.00	112.00	102.1500	5.21593	-.282	-.538
ALTH	60	45.00	63.00	53.2750	3.86140	-.014	-.147
ALK	60	41.00	55.00	48.9417	3.24180	-.268	-.185
ADSH	60	32.00	41.00	36.7333	2.24640	-.109	-.159
ADK	60	22.00	32.00	27.0500	1.68166	-.568	2.198
ADA	60	6.40	8.00	7.0050	.34318	.503	.084
AWBM	60	36.60	94.30	60.8583	12.78063	.780	.591
APCH	60	66.70	104.50	84.6033	8.05050	.695	.577
APTH	60	36.30	60.30	47.5050	5.59656	.220	-.399
APK	60	28.50	45.50	35.6233	3.76624	.715	.255
BMI	60	13.90	31.80	21.4067	4.02551	.977	.422
ASFT	60	45.00	198.00	106.9667	42.82126	.838	-.118
ASFK	60	55.00	198.00	132.2333	42.15362	.088	-1.170
ASFTH	60	53.00	198.00	114.0000	43.88197	.700	-.773
ASFS	60	52.00	198.00	110.6500	40.84233	.586	-.819

Table 2. Descriptive statistical parameters for Motor-specific variables

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
MTH	60	22.00	33.00	26.9167	2.72024	.274	-.590
MTF	60	19.00	36.00	29.2833	3.44984	-.282	.736
MTFW	60	18.00	32.00	24.9667	3.44431	-.002	-.577
MRTLB30’’	60	12.00	30.00	21.7333	3.84384	-.401	.369
MRTSC30’’	60	10.00	42.00	31.7667	5.77360	-1.070	2.386
MSQ	60	7.00	220.0e0	52.0000	33.43448	3.674	16.246
MPU	60	.00	38.00	14.1167	8.14715	.741	.581
MSR	60	3.00	33.50	21.4133	6.57802	-.265	-.182
MS	60	127.00	207.00	174.8417	13.15729	-.597	2.421

MFS	60	49.00	136.00	92.5333	21.64307	-.064	-.930
MET	60	17.28	25.56	19.9745	1.88128	.865	.496
M10X5	60	172.00	246.00	193.7833	16.35837	.826	.437
MTT	60	7.06	11.21	8.3842	.92174	1.143	1.432

Table 1 and 2 show the results of the basic statistical parameters Anthropometric and motor-specific variables such as: the minimum score, the maximum score, mean as a key indicator, standard deviation as the main indicator and main indicators of the shape of the curve distribution, the asymmetry of the curve or indicator skewness, and the curvature of the curve or indicator kurtosis.

From Table 1, we can conclude that the values of all anthropometric variables had major differences between the minimum and maximum results. Value standard deviations in the test (AWBM, APCH, AHB, ASFT, ASFK, ASFTH and ASFS) are at high level, and it is about results, which are heterogeneous results, while other anthropometric tests are at a low level, indicating that discrimination is not satisfying and this is a result which is homogeneous, or results that had low variability.

The asymmetry of the curve is low in almost all variables, and some others with negative values, which means that the distribution is normal (below 0), while the rounded value of the curve for most variables is below 2.75, so all these values are platykurtic, meaning that the results are distributed with arithmetic mean.

From Table 2, we can conclude that the values of all motor-specific variables also have a large difference between the minimum and maximum results. Value standard deviations in the test (MSQ, MPU, MS, MFS and M10X5) are at high level, and it is about results, which are heterogeneous and have high variability while other anthropometric tests are at low level, indicating that discrimination is not satisfying and that this is a result which is homogeneous, or results that had low variability.

The asymmetry of the curve is low in almost all variables, and some others with negative values, which means that the distribution is normal (below 0) while the rounded value of the curve for most variables is below 2.75, so that all these values have platykurtic character besides variable (MSQ), which is found in nature leptokurtic (results greater than 4:00).

Table 3. Eigenvalues and contribution of latent dimension in Anthropometric variables

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7.495	44.091	44.091	7.495	44.091	44.091	6.805	40.029	40.029
2	3.555	20.914	65.005	3.555	20.914	65.005	3.745	22.032	62.061
3	1.375	8.090	73.095	1.375	8.090	73.095	1.876	11.034	73.095

Extraction Method: Principal Component Analysis

Table 4. Factor matrix applied anthropometric measures and its orthogonal rotation VARIMAX

	H1	H2	H3	V1	V2	V3
AHB	0.531	0.802	-0.092	0.145	0.9	0.322
ALH	0.421	0.741	-0.199	0.067	0.853	0.184
ALL	0.512	0.766	-0.313	0.136	0.958	0.105
ALTH	0.57	0.406	-0.526	0.333	0.779	-0.223
ALK	0.157	0.751	0.137	-0.166	0.614	0.45
ADSH	0.456	0.322	0.396	0.292	0.269	0.558
ADK	0.731	0.115	0.352	0.627	0.226	0.477
ADA	0.051	0.414	0.541	-0.111	0.124	0.662
AWBM	0.966	-0.052	0.096	0.902	0.292	0.216
APCH	0.904	-0.171	0.113	0.896	0.163	0.174
APTH	0.838	-0.147	0.281	0.831	0.084	0.325
APK	0.836	-0.127	0.15	0.817	0.156	0.214
BMI	0.87	-0.382	0.148	0.954	-0.038	0.115
ASFT	0.714	-0.433	-0.239	0.822	0.027	-0.279
ASFK	0.509	-0.326	-0.299	0.589	0.06	-0.322
ASFTH	0.751	-0.435	-0.162	0.858	0.007	-0.205
ASFS	0.661	-0.247	-0.205	0.698	0.143	-0.181

Review of Tables 3 and 4, where according Hoteling's method are shown the factor matrix (FACMAT) applied anthropometric variables and Varimax-rotation, important characteristic roots (Total) the percentage of total variance explained (% Oxidizing variance), noted that the applied system of variables formed three important main components explain a total of 73.09% of the variance of the research space. The first main component has a distinctive root LAMBDA = 7.49 and a total of variability explained participate with 44.09%. The second major component has a distinctive root 3.555, and the total variability explained by participate with 22.03%. The third major component whose characteristic root is 1.37, a total of variability explained participate with 8.09%.

Factor to the first projections have significant variables for assessment of the volume and weight of the body (AWBM, APCH, APTH, APK, BMI) as variables for the evaluation of the skin folds of the body (ASFT, ASFK, ASFTH, ASFS). Saturation of all the variables AF1 are high positive and ranging from (.69) to (.95). From here this latent dimension can be defined as the factor of volume and skin folds of the body.

Significant projections to the second factor AF2 have variables to assess the longitudinal dimensionality of the skeleton (AHB, ALH, ALL, ALTH, ALK), high positive saturation of (.61) to (.95) which we can define as a factor of longitudinal dimensionality of the skeleton.

Also, significant projection to the third factor AF3 have variables to assess the transversal dimensionality of the body (ADSH, ADK, ADA), with positive saturation of (.47) to (.66) so it can define a factor transversal dimensionality of the body.

Table 5. Eigen values and contribution of latent dimension motor variables

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.668	35.904	35.904	4.668	35.904	35.904	2.805	21.578	21.578
2	1.885	14.501	50.406	1.885	14.501	50.406	2.368	18.213	39.791
3	1.116	8.583	58.989	1.116	8.583	58.989	2.205	16.961	56.752
4	1.011	7.779	66.768	1.011	7.779	66.768	1.302	10.016	66.768
Extraction Method: Principal Component Analysis.									

Table 6. Factor matrix applied motor measures and its orthogonal rotation VARIMAX

	H1	H2	H3	H4	V1	V2	V3	V4
MTH	0.52	0.634	0.037	0.276	-0.13	0.055	0.839	0.159
MTF	0.407	0.5	0.231	-0.579	-0.153	0.083	0.261	0.84
MTFW	0.647	0.594	0.036	-0.016	-0.294	0.109	0.717	0.401
MRTLB30’’	0.595	-0.152	0.255	0.051	-0.26	0.579	0.19	0.069
MRTSC30’’	0.212	-0.615	0.179	-0.271	-0.223	0.489	-0.489	0.036
MSQ	0.325	-0.359	-0.451	0.296	-0.527	0.073	0.014	-0.492
MPU	0.596	-0.158	0.431	0.467	-0.05	0.754	0.405	-0.218
MSR	0.67	0.23	-0.005	0.293	-0.343	0.298	0.616	-0.025
MS	0.497	-0.392	0.435	0.006	-0.137	0.753	-0.046	0.038

MFS	-0.608	0.212	-0.213	0.241	0.377	-0.551	0.176	-0.27
MET	-0.804	0.215	0.258	0.003	0.766	-0.368	-0.187	0.041
M10X5	-0.822	0.163	0.308	0.153	0.835	-0.301	-0.155	-0.091
MTT	-0.753	0.012	0.422	0.225	0.847	-0.108	-0.194	-0.171

From the review of Tables 5 and 6 are shown the factor matrix (FACMAT) the applied-specific motor variables and Varimax - rotation, important characteristic roots (Total), the percentage of total variance explained (% Oxidizing variance), notes that the applied system of variables formed four important main components explaining a total of 66.76% of the variance of the research space.

The first main component has a distinctive root LAMBDA = 4.6 and a total of variability explained participate with 35.9%. The second major component whose characteristic root is 1.8, the total explained by variability participates with 14.5%. The third major component whose characteristic root is 1.1, the total explained by variability participates with 8.58%. The fourth major component whose characteristic root is 1, the total explained by variability participates with 7.77%.

To the first factor projections remained significant for variables which assess agility (MET, M10X5, MTT). Saturation of all the variables MF1 are high positive and ranging from (.76) to (.84). From here this dimension can be defined as a factor of agility. Significant projections to the second factor MF2 retained variables to assess flexibility (MSR, MS, MFS), with positive saturation of (.29) to (.75) which may define as a factor of flexibility. Also, significant projection to the third factor MF3 retained variables to assess the segmental speed (MTH, MTF MTFW) with positive saturation of (.26) to (.83) which you can define a factor of segmental speed.

Table 7. Linear regression variables AF1 (model summary)

Model summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.817[a]	.668	.501	.29100	.668	4.018	4	8	.045
a. Predictors: (Constant), MF1, MF4, MF3, MF2									

And to the fourth factor MF4 significant factor retained variables to assess the repetitive force (MSQ, MPU), with saturation of (.21) to (49), which can define a factor of repetitive force**.**

Table 8. Regression analysis of variance AF1 (coefficients)

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.368	.106		3.464	.009
	MF4	-.384	.271	-.306	-1.415	.195
	MF3	.061	.254	.059	.239	.817
	MF2	.225	.265	.229	.850	.420
	MF1	.740	.258	.862	2.871	.021
a. Dependent Variable: AF1						

From Table 7, which shows the regression analysis of the variable AF1 (factor of volume and skin folds), it is seen that between prediction system and criteria variable is statistically significant relationship (R = 0.817), the level of Q = 0.045, respectively explain the common association with the variability 66.8% (R2 = 0.668).

The remaining 33.2%. in his explanation may be attributable to some other features and respondents who were not covered by these surveys.

Individually the greatest impact on the system of prediction variable AF1 (factor of volume and skin folds) has MF1 variable (factor of agility) (Table 8) with value and 0.86 significance level 0.021, where this value is a positive sign which means that the impact of the variable on the variable (MF1) and (AF1) positive. From this we can conclude that the greater will be the values of volume and skin folds of the body, the poorer will be the results in motor tests for assessment agility and vice versa.

Table 9. Linear regression variables AF2 (Model summary)

Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.843[a]	.710	.565	.23293	.710	4.894	4	8	.027

a. Predictors: (Constant), MF1, MF4, MF3, MF2

Table 10. Regression analysis of variance AF2 (coefficients)

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.422	.085		4.965	.001
	MF4	.636	.217	.592	2.934	.019
	MF3	.064	.203	.072	.314	.762
	MF2	-.090	.212	-.107	-.427	.681
	MF1	-.374	.206	-.508	-1.812	.108
a. Dependent variable: AF2						

Multiple correlation between the system of prediction variables and the criteria variable AF2 (factor of longitudinal dimensionality of skeleton) is shown in Table 9 and its value is 0.843 or specified correlation explains the common variability with about 71% (R2 = 0,710). The remaining 29% of the variability in explaining the criterion variable (AF2) can be attributed to other anthropological features that were not included in these studies (functional, conative, cognitive, social, etc.). From the displayed regression analysis of the variable AF2 is seen that between prediction system and criteria variable there is statistically significant effect, it is shown with significant worth 0.027.

It is worth mentioning that from the entire prediction system the greatest single influence has only variable MF4 (factor of repetitive force) (tab. 10), worth 0.592 and 0.019 significance level, where this value is a positive sign which means that the impact of the variable on the variable MF4 (factor of repetitive force) is AF2 (factor of longitudinal dimensionality of skeleton) positive.

From this we can conclude that the bigger is the value of the longitudinal dimensions of the skeleton, the weaker the results of the motor tests for evaluation of repetitive strength and vice versa.

Table 11. Linear regression variables AF3 (model summary)

Model summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.464[a]	.215	-.177	.24945	.215	.548	4	8	.706
a. Predictor: (Constant), MF1, MF4, MF3, MF2									

Table 12. Regression analysis of variance AF3 (coefficients)

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.300	.091		3.291	.011
	MF4	-.278	.232	-.397	-1.196	.266
	MF3	.022	.218	.038	.101	.922
	MF2	-.076	.227	-.137	-.333	.748
	MF1	-.182	.221	-.381	-.826	.433
a. Dependent variable: AF3						

Table 11 shows that multiple correlation between the whole system of independent variables (predictors) and the dependent variable (criteria) factor of transversal dimensionality of the skeleton (AF3) is worth R = (0.464), namely explains common variables about 21,5% (R^2 = 0,215), while the other 78.5% rate variability explains the common criteria variable attributable to other anthropological features not explored (as anthropometric variables, motor, conative cognitive, functional etc.).

Also, in this regression analysis between prediction systems and criteria variable AF3 (factor of transversal dimensionality of the skeleton) value of signification is 0.706, which means that there are no statistically significant results, so we will not comment on the results in detail.

4. Discussion

In this study, the main purpose is the influence and relevance of motor-specific abilities on anthropometric characteristics in pupils. After factoring the motor-specific variables (as a prediction system), and the anthropometric variables (as a criterion system), it was verified that of the four isolated motor-specific factors, such as: MF1 (agility factor), MF2 (flexibility factor), MF3 (segmental velocity factor) and MF4 (repetitive force factor) and the 3 anthropometric isolated factors, such as: AF1 (body volume and adipose tissue factor), AF2 (longitudinal dimension factor of the skeleton) and AF3 (transversal dimension factor of the skeleton), influence and relationships of statistically significant importance ($p < 0.05$), we have only between MF1 (agility factor) and AF1 (volume and adipose tissue factor), as well as MF4 (repetitive force factor) and AF2 (longitudinal dimension factor of the skeleton). Rodic (2012) tested the relationships and influence of anthropometric characteristics and motor skills on 135 eight-year old students, and concluded that anthropometric characteristics have a statistically significant ($p < 0.01$) positive impact on motor skills on motor tests expression of the explosive force of the upper and lower limbs. Podstawski and Boryslawski (2012) determined the relation between body mass index and height with some motor skills in 7-9 year-old students, and concluded that there were statistically significant high correlations between body mass index and motor tests of explosive force of the upper limbs. Radmila et al. (2009) analyzed the relationships between anthropometric characteristics and coordination ability in 176 students (91 males and 85 females) aged 8 years old and concluded that between anthropometric characteristics and coordination ability we have no statistically significant correlations in males, whereas in females we have statistically significant correlations. Sarah et al. (2015) tested the relationships and influence of age and anthropometric characteristics on some dynamic balancing motor skills in 160 pupils aged 5-12 years and concluded that dynamic balancing ability has direct relationships with chronological age, while the most important correlation with the balance ability had the age and the arm length or the longitudinal dimension of the skeleton. Parseh & Slhjoo (2015) determined the relationships between BMI and speed, agility and balance among 13-15 year old students and concluded that there were statistically significant relationships between body weight and volume and speed, while there were no significant correlations between body height and speed, agility and balance. Saeed et al. (2014) monitored the correlations between some anthropometric variables and basic-motor skills in 9-11 year old students and found that the most statistically significant correlations were between the jump motor tests and arm and thigh motor tests with $p < 0.05$ reliability.

5. Conclusion

From the analysis of the results and discussions we can conclude that specific-motor variables (as prediction system) have statistically significant influence and correlation on anthropometric variables (as criterion system). Factorized specific-motor variables (as prediction variables) have statistical significance on the anthropometric factorized variables (as a criterion system) as well as 2 of the 3 anthropometric variables such as: AF1 (body volume and adipose tissue factor) and AF2 (longitudinal dimension factor of the skeleton), with a confidence level of 0.04 and 0.02. Individually, the largest influence from the set of prediction variables on the criterion variables has only 2 motor-specific factors out of 4, such as: MF1 (agility factor) to AF1 (volume and adipose tissue factor) and MF4 (repetitive force factor) in AF2 (longitudinal dimension factor of the skeleton), with values of 0.86 and 0.59 and confidence level of 0.02 and 0.01. From this we can conclude that the greater the value of volume and adipose tissue of the body, the poorer will be the results of agility motor tests and vice versa and the greater the value of the longitudinal dimension of the skeleton, the weaker the results of the motor tests of the repetitive force and vice versa.

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