COMPLEX FOOTBALL TRAINING'S INFLUENCE ON THE QUALITATIVE CHANGES OF THE BASIC MOTOR ABILITIES

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Abstract
Main goal of this research is to determine the level of change in basic motor abilities with footballers who are undergoing one year training process. Research included 107 16 and 17 years old footballers actively training and playing in cadet's championship. 17 tests of abilities have been used to evaluate the basic motor abilities: explosive power, speed, coordination, repetitive power, flexibility and balance. Tests were standardized and publicized. The program lasted for a year and its main feature was the mixture of working methods where the training processes were designed in a way that drill trainings and no ball trainings were dominant. We have analysed the qualitative changes in the structure of the basic motor abilities in football and the differences in the structure of the covariance matrix of the manifest and latent variables in two places in time, from which the component model of the factorial analysis is derived. After the results are analysed we can say that a year of a training program lead to changes in transformation of a basic motor abilities, as well as to positive qualitative changes in the structure, position and the number of latent dimensions, as well as in hierarchical subordination of the centers for the structure of swinging.

Key words*: football, complex training, qualitative changes*

Introduction

All specifics of the football game are changed in time becoming advantages or disadvantages, and these changes can be universally called transformational changes. They consist of planning, programming, execution and control of training process and all of that in order to achieve predetermined goal, and the goal of transformation processes is to achieve such a changes of the subject that are the closest to ideal state.

All the abilities at the beginning of the transformation process have their features and the level of development, and essentially, these determine initial state. This state of the sportsman is marked by the level of development of his abilities, his features and knowledge, as well as by interrelations that at the certain moments occur between the certain features, abilities and knowledge. Besides that, it is possible to split individual motor ability aspects and physical components such as: power, speed, stamina and coordination. Individual ability to perform the exercise is the fundamental, and the movement itself if effect. Hence, what sportsman needs is ability to control that goal in order to reach successful effect.

Motor abilities that are the fundaments of the goal are largely genetic and inherited abilities. After the initial levels are determined sportsman enters training process with such a training operators used that will finally change the initial levels. In time systematic training will be used as the stimulant for development to change the human body. After certain time in training sportsman will significantly change in its features and abilities, and that will become visible, and then we are reaching the final stage that, if all went according to plan, should be better than the initial state.

Problem

Like with all other science disciplines that studies humans and his achievements, the main goal of kinesiology is to try to discover and determine everything that influences and significantly improves human abilities, and how to, especially in sports, find appropriate tools that would adequately improve abilities and sportsman's characteristics in relation with achieving even greater and better results. The problem of this research is to determine qualitative transformational changes of basic motor

abilities with footballers aged 16 and 17. The aim is to set the level of qualitative changes of basic motor abilities with footballers that are under training process.

Methods

Sample of subjects

In this research sample is 107 16 and 17 years old footballers. All sportsmen included in research are registered players with cadets teams competing in municipal or regional leagues. All players in the sample group are part of a training process in their clubs for years, so they can be considered as samples of footballer's qualities for their age.

Sample of variables

Total of 17 variables have been used to evaluate basic motor abilities: explosive power, speed, coordination, repetitive power, flexibility and balance: 1. Standing long jump (MFESDM), 2. Standing triple jump (MFETRO), 3. Standing high jump (MFESVM), 4. 20 m running, high start (MFE20V), 5. Foot tapping against the wall (MBFTAZ), 6. Foot tapping (MBFTAN), 7. Foot slalom with two balls (MKLSNL), 8. Steps to a side (MAGKUS), 9. Mobility in the air (MKTOZ), 10. Push ups (MRESKL), 11. Lifting torso from lying position (MRCDTŠ), 12. Forward bend on the bench (MFLPRK), 13. Forward bend with spread legs (MFLPRR), 14. Side stretch (MFLBOS), 15. Standing on a both feet along a balance bench with eyes opened (MBAU20), 16. Standing sideways on a low balance bench with eyes shut (MBAP2Z), 17. Standing on a foot along a balance bench (MBAU10).

Tests were carried out on a football courts, and both test were done by same measurers.

Method of data processing

Factor analysis method was used to determine qualitative changes as a result of football trainings that are shown in change of basic motor abilities. Bartlett test was used to test possibility of submitting treated variables to any type of factorization.

To estimate importance of isolated latent dimensions Guttman-Kaiser criterion was used, and according to it all the latent dimensions with characteristic route is larger or equal to 1 are considered important.

Results and discussion

In the area of basic motor abilities data from tables 1 and 2 show that those can be submitted to factorization (sig .00). Tables 3 and 4 are showing characteristic routes and explains parts of variance of initial and final testing of the basic motor abilities. On the basis of the Guttman-Kaiser criteria, that all results of the initial testing were submitted to, 5 major components were isolated, and those 5 can explain the whole manifest space of the basic motor abilities in a 70,72% of the common variance, hence 29% of variance are under uniquity influence. Separate contribution in explaining common variance for a first major component is 27,91 %, for a second is 20,13 %, for a third it is 9,63%, for a fourth it is 7,14% and for a fifth it is 5,19%.

Variable determining explosiveness have been isolated in a first major component, that is explaining the largest part of a common variance. These are: standing long jump, standing triple jump and it can be defined as explosiveness factor, because the largest projections on this motor ability are from these variables. Besides these ones high projections also have 20 m running, high start, determining motor ability – speed, and variable Lifting torso from lying position that determining motor ability - Repetitive power. 20 m running is a variable mentioned used in evaluation of explosive power, while the Lifting torso from lying position has been used to evaluate repetitive power – one form of motor ability – strength. In a second major component variables determining the balance has been isolated. These are: Standing on a both feet along a balance bench with eyes opened and Standing sideways on a low balance bench with eyes shut and Standing on a foot along a balance bench. This second major component can be defined as a balance factor. The largest projection on a third major component have the variables determining the motor ability – coordination: Foot slalom with two balls and Mobility in the air,and this can be defined as the factor of coordination. Foot tapping against the wall and Foot tapping have the largest projection on the forth major component, and it can be defined as the factor of speed. Forward bend on the bench and Forward bend with spread legs have the largest projection on a fifth major component, and this factor can be defined as the factor of flexibility.

During the final measurements of motor abilities (table 6) 4 major components explaining 60.80% of the common variance (around 39% of variance is under the ubiquity influence) have differentiate, where the separate contribution on first component amounts 30.06%, on second 12.27%, third 10.34% and on a fourth 8.11%. Analysing the matrix of the structure of final measurements (table 6) shows reduction of the number of isolated major components (4), that, in principal, are determining motor spaces as with the initial measurements, taken that certain motor dimensions are being determined with other major components. Comparing the matrixes of the structure of initial and final measurements (tables 5 and 6) one can notice changes in transformations of basic motor abilities, as well as positive qualitative changes in the structure – being shown by the reduction of number of isolated factors, as well as by the position of latent dimensions and hierarchical subordination of the centres for structure of fluctuations. From the matrix of correlations of isolated major components (table 7 and 8) one can notice that isolated major components are independent of each other, and that is shown by the low and negative coefficients of their interactive correlations.

Table 1. KMO and Bartlett's Test – initial

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.76
Bartlett's Test of Sphericity	Chi-2	
	df	136
	Sig.	0.000

Table 2. KMO and Bartlett's Test – final

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.77
Bartlett's Test of Sphericity	Chi-2	
	Df	136
	Sig.	0.000

Table 3. Total Variance Explained – initial

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4,746	27,916	27,916	4,746	27,916	27,916
2	3,422	20,131	48,047	3,422	20,131	48,047
3	1,637	9,630	57,678	1,637	9,630	57,678
4	1,215	7,146	64,823	1,215	7,146	64,823
5	1,004	5,905	70,729	1,004	5,905	70,729

Table 4. Total Variance Explained – final

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5,112	30,068	30,068	5,112	30,068	30,068
2	2,087	12,275	42,342	2,087	12,275	42,342
3	1,758	10,341	52,683	1,758	10,341	52,683
4	1,380	8,117	60,800	1,380	8,117	60,800

Table 5. Pattern Matrix –initial

	Component				
	1	2	3	4	5
MFESDMI	**0.73**	0.07	0.21	0.10	0.34
MFETROI	**0.71**	-0.23	0.21	-0.16	0.30
MFESVMI	0.58	-0.49	-0.12	-0.19	0.02
MFE20VI	**-0.75**	-0.04	0.22	0.07	0.00
MBFTAZI	-0.01	0.15	0.01	**-0.91**	0.00
MBFTANI	0.28	-0.04	-0.14	**-0.68**	0.09
MKLSNLI	0.19	0.24	0.70	0.26	-0.29
MAGKUSI	-0.22	0.19	0.27	0.13	-0.48
MKTOZI	-0.08	-0.20	0.81	-0.03	0.16
MRESKLI	0.38	0.59	0.06	-0.11	-0.04
MRCDTSI	0.75	0.04	-0.06	-0.16	-0.21
MFLPRKI	-0.06	0.16	0.24	-0.24	**0.81**
MFLPRRI	0.08	0.15	-0.30	0.21	**0.64**
MFLBOSI	0.24	0.28	-0.36	0.13	0.43
MBAU20I	0.03	**0.83**	-0.02	0.12	0.18
MBAP2Z	-0.09	**0.91**	-0.01	-0.12	-0.01
MBAU10I	-0.15	**0.83**	-0.13	-0.04	0.08

Table 6. Pattern Matrix – final

	Component			
	1	2	3	4
MFESDMF	-0.10	0.37	**-0.72**	0.25
MFETROF	-0.01	0.16	**-0.81**	0.02
MFESVMF	0.19	-0.36	**-0.71**	-0.16
MFE20VF	-0.01	0.01	**0.71**	0.04
MBFTAZF	**0.78**	0.00	-0.06	0.09
MBFTANF	**0.68**	-0.10	-0.15	-0.27
MKLSNLF	-0.19	0.14	0.14	**0.76**
MAGKUSF	-0.06	0.03	0.55	0.05
MKTOZF	0.12	-0.21	-0.05	**0.68**
MRESKLF	0.55	0.12	-0.18	0.31
MRCDTSF	0.48	-0.17	-0.48	-0.04
MFLPRKF	0.50	0.43	0.01	-0.13
MFLPRRF	0.15	0.49	-0.19	-0.23
MFLBOSF	-0.29	0.56	-0.39	-0.30
MBAU20F	0.29	**0.76**	0.11	-0.16
MBAP2ZF	0.05	**0.84**	-0.06	0.18
MBAU10F	0.22	0.20	0.13	-0.10

Conclusion

The point of every training activity, as well as this program, is to condense the group of abilities in order to even more rationally and efficiently displays footballers capacity. Under the one year program of activities there were some changes in transformation of the basic motor abilities and positive qualitative changes of the structure.

For all these reasons we can say that the program is efficient and that it is pushing the change in a motor structure. Generally, this was expected considering the drill trainings and trainings without the ball, where the accent is put on developing these basic motor abilities, and where the movements are predetermined and very similar to tests used in this research.

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UTJECAJ KOMPLEKSNOG NOGOMETNOG TRENINGA NA KVALITATIVNE PROMJENE BAZIČNIH MOTORIČKIH SPOSOBNOSTI

Sažetak

Glavni cilj ovog istraživanja je bio određivanje razine promjena bazičnih motoričkih sposobnosti kod nogometaša koji sudjeluju u jednogodišnjem trenažnom procesu. Istraživanje je uključivalo 107 nogometaša uzrasta 16 i 17 godina koji aktivno treniraju i natječu se u kadetskom prvenstvu. Primjenjeno je 17 testova radi evaluacije bazičnih motoričkih sposobnosti: eksplozivnosti, brzine, koordinacije, repetitivne snage, fleksibilnosti i ravnoteže. Testovi su standardizirani i publicirani. Glavna zadaća jednogodišnjeg treninga bila je mješavina trenažnih metoda pri čemu je trenažni proces bio dizajniran na način da je kondicijski trening i rad bez lopte bio dominantan. Analizirane su kvalitativne promjene u strukturi bazičnih motoričkih dimenzija u nogometu i razlike u strukturi latentnih varijabli u dva mjerenja dobivenih komponentnom faktorskom analizom. Rezultati su pokazali da jednosgodišnji trening vodi u promjene i transformacije motoričkih sposobnosti, kao i u pozitivne promjene u strukturi i u broju latentnih dimenzija, kao i hijerarhijskoj subordinaciji središta za strukturiranje gibanja.

Ključne riječi*: nogomet, kompleksni trening, kvalitativne promjene*