

Influence of the motor and functional abilities to the efficiency of football techniques elements performance

Key words: **basic motor abilities, functional abilities, football techniques**

Ključne riječi: **osnovne motoričke sposobnosti, funkcionalne sposobnosti, nogometna tehnika**

Original scientific paper

Abstract

Goal of this research is to confirm influence of the predictor's summary, motor and functional variables to the criteria variables of performance football techniques elements among 88 football players' ages 12-14 years. Eighteen variables were used for the motor abilities estimation, two variables for the functional abilities estimation and fifteen variables for the football techniques elements performance. Manifolds regression analysis is used for the confirmation of predictor's influence to the criteria, with which we tried to define which variables of predictor's system (motor and functional abilities) mostly define criteria variable that represents general success while realization of move-technical elements of football. Our interest was how predicting system of motor and functional abilities influence learning efficiency and football techniques elements performance. Regression analysis was done and it points the connection of system of predictors and criteria, and criteria variable represents first main component in which all element of football techniques are saturated.

Result was that that system of criteria variables are connected to the predictor's system with high coefficient .83 and part of variability of predictive values of 69% is explained. As follows, we can surely say that this high coefficient is in function of best realization of moving structure in football. Percentage of inexplicable variability with this predictive system would probably define some other characteristics and abilities that didn't fit into this research.

Sažetak

Cilj istraživanja je utvrditi uticaj skupa prediktora, motoričkih i funkcionalnih varijabli, na kriterijske varijable uspješnosti izvođenja elemenata nogometne tehnike kod 88 nogometaša uzrasta 12-14 godina. Za procjenu motoričkih sposobnosti korišteno je 18 varijabli, procjenu funkcionalnih sposobnosti 2 i za procjenu izvođenja elemenata nogometne tehnike 15 varijabli. Za utvrđivanje uticaja prediktora na kriterije korištena je klasična regresiona analiza kojom se nastojalo definirati koje varijable prediktorskog sistema (motoričke i funkcionalne sposobnosti) najznačajnije definiraju kriterijsku varijablu koja predstavlja generalnu uspješnost pri realizaciji kretno-tehničkih elemenata iz nogometa. U radu nas je interesovalo kako to prediktivni sistem motoričkih i funkcionalnih sposobnosti utiče na efikasnost učenja i izvođenja elemenata tehnike u nogometu. Urađena je regresiona analiza i ona nam ukazuje da je povezan sistem prediktora sa kriterijem, a kriterijska varijabla predstavlja prvu glavnu komponentu u kojoj su saturirani svi elementi nogometne tehnike. Dobili smo da je taj sistem kriterijskih varijabli povezan sa prediktorskim sistemom visokim koeficijentom .83 i da je objašnjen dio varijabiliteta prediktivnih vrijednosti 69%. Dakle, možemo sa sigurnošću kazati da je ovaj visoki koeficijent u funkciji što bolje realizacije kretnih struktura iz nogometa. Procenat neobjašnjene varijabiliteta ovim prediktivnim sistemom vjerovatno bi definirale neke druge karakteristike i sposobnosti koje nisu ušle u ovo istraživanje.

Introduction

Every kind of sports game has its own characteristic structure where sports game that in essence looks alike differs a lot in structure.

Football game, on first sight complex one, containing simple elements of the game allows creation of preconditions for play almost anywhere. The game lasting 90 minutes and size of playground are clear indicators of football load. Those indicators show that football is aerobic sport. However, during the football game players perform sprints, sprints, jumps, and high intensity workouts. (Sporiš, 2007) Football player uses aerobic and anaerobic mechanisms that are constantly in change. They differ from the others by specific structure and summary of huge number of features makes it special.

Contrary to the past when technical readiness was the most important, nowadays' game requests from players higher level of

physical readiness. Physical readiness is key element for success in football (Wang, 1995).

Modern football effected high level of developing tactical-technical physical and psychological characteristics and abilities where elements of the game and work merge; elements of programming and released creativity also, elements of "artistic" and "industrial", and finally elements of freedom and rigorous responsibility (Barišić, 1996).

Football players their success in football game realize by manifestation of huge number of abilities and knowledge, their structure and quality. Mentioned abilities and features are named as success factors and hierarchically they are made of three groups of success factors in football game.

First group is made of factors that are expressed through basic anthropological features and abilities of football players, first of all thinking of: health state, motor abilities, functional abilities, cognitive and emotional factors so as morphological characteristics. Second group of success factor in football game contents: specific theoretical knowledge, technical and tactical abilities, specific motor abilities and so on. Third group of success factors content situational efficiency of results achieved in competition. (Verheijen, 1997).

¹Faculty of Sports and Physical Education, University of Sarajevo, Bosnia and Herzegovina

²Teachers' Training Faculty, University "Džemal Bijedić" in Mostar, Bosnia and Herzegovina

The problem of this research represents confirmation of dependency success degree performance of football techniques on motor and functional football players' abilities. The aim of work is to confirm influence of predictors' group, motor and functional variables to the criteria success variables of football technique's elements performance of players.

Methods

Sample of examined

Football players 12-14 years old represented the specimen. The choice of specimen depended on objective and subjective factors that were dictated by conditions, applied variables and goal of research. Based on chosen statistical-mathematical model, program and goals of research, the specimen was represented by 18 examined.

Sample of variables

For the estimation of motor abilities in this research we choose variables for which we presume that cover region of latent dimension of moving and energetic relation of football players, same as performance elements of football techniques.

Variables for estimation of motor abilities

1. Polygon backwards MREPOL; 2. Steps aside MAGKUS; 3. Legs' slalom with two balls MKLSNL; 4. Foot-tapping on the wall MBFTAZ; 5. Foot-tapping MBFTAN; 6. 20m run with standing start MFE20V; 7. Standing long jump MFESDM; Standing high jump MFESVM; 9. Medicine ball throws from lying position MFEBML; 10. Push-ups MRESKL; 11. Body lift-ups from lying MRPTL; 12. Squats MRSCUC; 13. Forward bend on the bench MFLPRK; 14. Astride-stand forward bend MFLPRR; 15. Aside straddle MFLBOS; 16. Both legs stands transversally on the bench for balance with open eyes MBAP20; 17. One leg stands longitudinally on the bench for balance with open eyes MBAU10; 18. Both legs stand transversally on the bench with close eyes MBAP2Z.

Variables for a functional ability estimation

1. 12 minutes run FAE12M; 2. 6x50m run FS6X50

Variables for the estimation of the elements performance of the football techniques

1. Inside foot receiving ball PLUDS; 2. Upper leg receiving ball PLNKOO; 3. Chests receiving ball PLGRUU; 4. Full foot ball kick ULPDS; 5. Heading ULGLC; 6. Volley kick ULDRK; 7. Feet juggling ZOLNO; 8. Head juggling ZOLGL; 9. Free juggling ZOLSL; 10. Outside foot leading ball VOLVA; 11. Inside foot leading ball VOLUN; 12. Leading ball in juggling direction VOLZO; 13. Outside dribbling DRLVA; 14. Inside dribbling DRLUN; 15. Rolling dribbling DRLRO

Data base methods

Using multiple regression analysis we tried to define variables of the predictor system of motor and functional abilities that significantly define criteria variable (Rado, 2002) which represents general succeed realizing moving-technical elements of football. First main component represents isolated latent dimension in which are extracted points of all success variables of performing football techniques and it represents criteria variable.

Results and Discussion

In table 1 we see that among whole variable system, namely predictors system and criteria variable, multiple correlations RO is .83 and it explains 69% of mutual variability.

That kind of connectivity is important at the level of mistake .00, which represents critical value and F-distribution is for counting. Concerning that F-distribution is counted as distribution of quotient of two points, confirming that, two degrees of liberation are defined.

First degree of liberation is equal to the number of predictors' variables, in this case number of tests for the estimation of motor abilities and it is marked as Df-1; and the others are defined by number of entities diminished for the number of predictors' variable minus 1, which means $Df2=N-n-1$.

In this work we are interested how predictive system of motor and functional abilities influence efficiency of learning and performing techniques' elements of the football. Regression analysis was done and it points to the connection between the predictors' system and criteria, and criteria variable represents first main component in which all elements of football techniques are saturated.

As we already pointed, we have got the situation that system of variables is connected with predictors' system by high coefficient .83 and part of variability of predicting values of 69% is explained. So we can say for sure that this high coefficient is in function of best possible realization of moving structure in football. Percentage of unexplained variability with this system would probably define some other characteristics and abilities that didn't enter into this research.

What mostly influences realization of football techniques? This system of motor and functional abilities has significant influence in whole, but looking at one-variant level, we see that coordination, repetitive and explosive strength are specially dominant motor abilities that have influence, talking about realization of movement structure in football.

To have fulfilled picture and to have all this as reminder for the researches that we'll find and count in last round, we have to say that one important dimension in football that is extracted and confirmed scientifically and theoretically is agility MAGKUS-steps aside, has pretty high Beta coefficient and T-test, and he is impor-

Table 1.
Relationship among predictors' and criteria variables

	R	R SQUARE	ADJUSTED R SQUARE	STD. ERROR OF THE ESTIMATE	CHANGE STATISTICS				
Model					R Square Change	F Change	df1	df2	Sig. F Change
1	.831	.691	.599	.633	.691	7.501	20	67	.000

Table 2.
Relation of predictor and criteria systems and T-test

		UNSTANDARDIZED COEFFICIENTS		STANDARDIZED COEFFICIENTS	T	SIG.
Model		B	Std. Error	Beta		
1	MREPOL	.217	.013	.299	1.444	.003
	MAGKUS	-.174	.091	-.223	-1.913	.050
	MKLSNL		.018	-.120	-1.260	.212
	MBFTAZ		.020	.097	1.005	.319
	MBFTAN		.016	.040	.446	.657
	MFE20V	-.436	.408	-.106	-1.069	.049
	MFESDM		.008	.057	.442	.660
	MFESVM	.327	.020	-.239	-2.408	.019
	MFEBML		.001	.185	1.734	.076
	MRESKL	.315	.017	.231	2.103	.039
	MRSPTL		.028	.034	.373	.711
	MRSCUC		.030	.193	2.216	.050
	MFLPRK		.021	-.129	-1.315	.193
	MFLPRR		.011	.043	.339	.735
	MFLBOS		.010	-.143	-1.368	.176
	MBAP20	.336	.013	.172	2.073	.042
	MBAU10		.003	-.068	-.857	.394
	MBAP2Z		.078	-.084	-.980	.331
	FAE12M		.000	-.030	-.286	.775
	FS6X50	.442	.029	-.440	-2.892	.005

tant at the level .05, which points us that dimension of agility has important influence to the criteria variable.

Talking about influence of the functional abilities as predictors for criteria, results of regression analysis shows statistically important multiple connection of predictors' system with criteria. Prognostic value is highest with tests FS 6X50, which points that optimal developed basic endurance represents one of the basic precondition for strong playing efficiency. Looking from conditional point of view, as much as it is developed, re-synthesis of energy phosphate rich comes more practically (ATP, KP). During interval loading they (ATP, KP) represent crucial source of energy. High aerobic capacity assures optimal work on load, regeneration, recovery and bearing of load. (Visscher, 2006). Basic aerobic endurance represents fundamentals for high level of quality and quantity training for special abilities development of tests for coordination estimation and tests for estimation of explosive and repetitive power (Chamari et al., 2005).

So, we can emphasize that with regression analysis it is possible to define pretty good influence of the predictor's system to the explanation of criteria and referring to the criteria prediction of whole system is significant.

The results of regression analysis show us that wide spectrum of motor functioning positively influence to the realization of football techniques elements. That way it discovers that in base of moving structure in football bears treasure and referring to football techniques complexity of dynamic system of movement.

Conclusion

In this work the subject of our interest was how the predicting system of motor and functional abilities influences learning and performance of the football techniques elements efficiency. Regression analysis was done and it points to the connection of

predictor's system with criteria; and criteria variable represents first main component in which all elements of football techniques are saturated.

We have got results that this system of criteria variables is connected with predictors system with high coefficient of .83 and part of predictive variability values of 69%. However, we can surely say that this high coefficient is in function of best possible moving structure in football. Percentage of unexplained variability using this system would probably define some other characteristics and abilities that didn't enter into this research.

What mostly influence realization of football techniques? Whole this system of motor and functional abilities has pretty important influence, but when we look at the one-variant level we see that coordination, repetitive and explosive power, are especially dominant motor abilities referring to the influence to the realization of moving structure in football.

In conclusion we can emphasize that using regression analysis it is possible pretty correctly to define influence of the predictors' system to the criteria explanation and importance of whole system prediction referring to the criteria.

Regression analysis results shows us that wide spectrum of motor functioning positively influences realization of football techniques elements and it discovers on some way that fundamentals of moving structure in football contents treasure and complexity of dynamic system of movement that is present in subject of football techniques.

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Correspondence to:

Munir Talović

Faculty of Sports and Physical Education, University of Sarajevo

Patriotske lige 41

70 000 Sarajevo, Bosnia and Herzegovina

Phone: +387 33 668 768

E-mail: mतालović@fasto.unsa.ba

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