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INFLUENCE ON SOME MANIFEST MOTOR VARIABLES IN THE SUCCESSFUL PERFORMANCE OF SOME SITUATIONAL HANDBALL TASKS

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Abstract

On a sample of 108 high school handball students from the Republic of Kosovo who placed in the state championship in school, a research was conducted in order to determine the impact of some manifest motor variables in the successful performance of some situational handball tasks. For that purpose, a system of 15 motor variables was applied, which hypothetically covered most of the motor space, as a predictor system and 3 situational motor variables as a criterion system. The obtained results were processed by regression analysis in the manifest space. The results of the research showed that students - handball players who have a better level of motor skills perform the set situational tasks more successfully. Strength, especially explosive force and coordination (the mechanism for structuring movements) have the greatest impact on the successful execution of the set tasks. The results of the regression analysis in an indirect way indicated that the large body mass is an obstacle in the successful performance of the first two criterion variables ("running the ball between sticks" and "starting speed with a ball at 20 m").

Key words: *handball;situational tasks;motor skills*

Introduction

Handball is a sports game that belongs to the polystructural sports. It is a dynamic ball game, which activity is characterized by continuous movement with and without change of direction, with fast sharp sprints, high jumps, with various falls and groundings and constant contacts and duels with the opponent. Goal shots, especially jumping elements, falls and throws in the goal area, goalkeeper's defense and frequent goals make it attractive and appealing to participants and spectators.

In handball, there are natural body movements, running, jumping and throwing, which, with simple rules, make the game accessible to children and young people.

The sporting quality of the handball game requires the players to adopt complex body movements and a large complex of specific structural elements of technique and tactics. Success in handball depends on many abilities and characteristics of the anthropological status and it is especially important to prove in a scientific way what those abilities and characteristics are and to what extent they influence the successful performance of certain movements specific to the handball game.

In the context of these considerations, this research was conducted with the main goal to analyze the impact of some manifest motor variables on the successful performance of some situational tasks in the handball game among students - handball players.

Method of work

The research was conducted on a sample of 108 high school handball students from the Republic of Kosovo, who have been training handball for at least 5 years and have a minimum of 3 training sessions per week. The prediction system consisted of 15 manifest motor variables that hypothetically covered most of the motor space. They are: "20 m from a high start" (M20M), "Steps to the side" (MCHS), "hand taping" (MTAR), "backstroke" (MPOLN), "slalom with three medical balls" (MS3M), "Coordination with a club" (MORP), "long jump" (MSKDA), "throwing a medicine ball while lying" (MFMEL), "high jump" (MSKM), "spark" (MISK), deep Bench Coupling ”(MPCC),“ Standing Leaning ”(MPRS),“ Shaft

Bends ”(MAFWE),“ Lifting the Body from Lying Down for 30 Seconds ”, (MPT30C) and“ Push-ups ”(MSKL)

The criterion system consisted of 3 situational-motor variables: “running a ball between sticks”, (SVTMS)),“starting speed with a ball at 20 m”(BS20M) and “throwing a handball from a sitting position” (IRTSP)

The influence of the manifest and latent predictive system on the criterion manifest and latent variables was determined by regression analysis. Previously, the normality of the distribution of the results from the applied motor variables was checked by the method of Kolmogorov and Smirnov.

Results

The data of the Kolmogorov-Smirnov procedure shows that the results of the 18 manifest general and specific motor variables do not deviate from the normal distribution, i.e. statistically significant at the level of 1%, coincide with the theoretical curve of that distribution, which was possible methodologically to perform further processing of the data correctly.

Table 1. Regression analysis of the ball bearing variable between stands

	Variable	R	Part-R	BETA	T-TEST	Q
1	BR20VS	, 32	, 00	, 00	0.00	, 99
2	CVSTR	, 52	, 33	, 34	3.32	, 00
3	TAPRAK	-, 33	-, 05	-, 04	-0.45	, 65
4	POLNAZAD	, 44	, 13	, 17	1.27	, 21
5	SLA3M	, 15	-, 01	-, 01	-0.06	, 95
6	KORPAL	, 45	, 18	, 19	1.77	, 08
7	SDM	-, 30	-, 01	-, 02	-0.12	, 91
8	FML	, 14	, 24	, 21	2.39	, 02
9	SVM	-, 30	-, 04	-, 04	-0.34	, 73
10	ISKRET	, 09	-, 12	-, 11	-1.20	, 23
11	DPKL	, 08	, 04	, 05	0.42	, 68
12	PRS	, 19	, 12	, 12	1.13	, 26
13	ZVPOT	-, 24	, 07	, 11	0.67	, 50
14	PTL30SEK	-, 39	-, 20	-, 22	-1.96	, 05
15	SKR	-, 15	, 04	, 06	0.41	, 69
	DELTA .68		RO .46	DF1 15	DF2 92	Q .00

Table 2. Regression analysis of the variable starting speed at 20 meters

	Variable	R	Part-R	BETA	T-TEST	Q
1	BR20VS	, 75	, 52	, 52	5.91	, 00
2	CVSTR	, 46	, 15	, 12	1.46	, 15
3	TAPRAK	-, 25	-, 02	-, 02	-0.23	, 82
4	POLNAZAD	, 29	-, 03	-, 03	-0.25	, 81
5	SLA3M	-, 20	-, 36	-, 28	-3.70	, 00
6	KORPAL	, 30	, 05	, 04	0.52	, 60
7	SDM	-, 44	-, 10	-, 10	-0.95	, 35
8	FML	, 05	, 09	, 06	0.83	, 41
9	SVM	-, 33	-, 04	-, 04	-0.39	, 70
10	ISKRET	, 07	-, 03	-, 02	-0.28	, 78
11	DPKL	, 11	, 17	, 15	1.65	, 10
12	PRS	, 07	-, 06	-, 05	-0.55	, 58
13	ZVPOT	-, 42	-, 07	-, 09	-0.72	, 47
14	PTL30SEK	-, 36	-, 17	-, 14	-1.64	, 11
15	SKR	-, 33	, 02	, 03	0.23	, 82
	DELTA .82		RO .67	DF1 15	DF2 92	Q .00

From Table 1 it can be seen that there is a statistically significant correlation (Q = .00) between the system of predictor manifest motor variables and the criterion variable “ball running between sticks”. The multiple correlation is .68, which means that the system of 15 predictor manifest variables can explain the criterion variable by 46%. The remaining 54% in explaining the total variability of the variable ”running the ball between sticks“ can be attributed to other abilities and characteristics of the respondent, which were not taken into account in this study, as well as to the conditions during the test. From the analysis of the impact of the individual motor variables, it can be seen that the variables ”steps to the side“, ”lifting the torso for 30 seconds“ and ”throwing a medical ball from lying down“ have the greatest and statistically significant impact.

Table 3. Regression analysis throwing a handball out of a supine position

	Variable	R	Part-R	BETA	T-TEST	Q
1	BR20VS	-, 25	-, 24	-, 31	-2.41	, 02
2	CVSTR	-, 25	-, 11	-, 12	-1.04	, 30
3	TAPRAK	, 05	-, 05	-, 05	-0.47	, 64
4	POLNAZAD	-, 26	-, 22	-, 33	-2,21	, 03
5	SLA3M	-, 18	-, 04	-, 05	-0.42	, 68
6	KORPAL	-, 05	, 25	, 30	2.46	, 02
7	SDM	, 26	-, 07	-, 10	-0.66	, 51
8	FML	, 28	, 25	, 25	2.50	, 01
9	SVM	, 22	, 00	-, 01	-0.05	, 96
10	ISKRET	-, 16	, 00	, 00	-0.04	, 97
11	DPKL	, 26	, 10	, 12	0.92	, 36
12	PRS	, 28	, 17	, 19	1.63	, 11
13	ZVPOT	, 19	-, 11	-, 20	-1.06	, 29
14	PTL30SEK	, 27	, 15	, 19	1.47	, 14
15	SKR	, 14	-, 04	-, 05	-0.35	, 73
	DELTA .56		RO .32	DF1 15	DF2 92	Q .00

Based on the results obtained from the regression analysis, it can be concluded that students - handball players who have a higher level of motor skills perform this situation variable more successfully. The results indicate that the greatest impact in the successful performance of the situational variable "running the ball between sticks" has the predictor variable "steps to the side", which assesses the ability to quickly move the body in space by changing the direction of movement - agility. The mechanism for structuring the movements under central control and the mechanism for regulating the intensity of excitation are largely responsible for the variability and covariance of the predictor variable "steps on the side". Characteristic of the criterion variable is the rapid movement of the body in space with a rapid change of direction of movement due to which it is understandable the great influence of the predictor variable "steps to the side" in the successful performance of the criterion variable (involving similar mechanisms in both motor tasks) **.** The repetitive strength of the abdominal muscles also has a great influence on the successful performance of the situational variable. Research and practice to date have shown that strong abdominal muscles play a significant role in many locomotors movements. While the predictor variable "throwing a lying medicine" has a negative impact on the criterion variable (handball students who perform this test achieved poorer results in the criterion variable).

The whole system (Table 2) manifest motor variables statistically significantly influences the successful performance of the motor situational variable "starting speed of 20 meters". The multiple correlation is .82 and explains the common variability between the system and the criterion variable of about 67%. The variables "20 meters from a high start" and "slalom with 3 doctors" have a statistically significant impact on the overall prediction system.

Also, the situational variable "starting speed of 20 meters running the ball" in an even higher percentage than the previous situational variable is more successfully performed by students - handball players who have a higher level of development of motor skills. The students-handball players who more

successfully perform the test "20 meters from a high start" achieved better results in the criterion variable. Number of motor units in the shortest possible time in order to accelerate the body that moves in space or acts on objects in the environment. In the case of this situational variable, maximum mobilization of the muscle units is necessary for the shortest possible time in order to accelerate the body and move in space for the shortest possible time. In addition, the student handball players who more successfully perform the test "slalom with 3 medical balls" achieved poorer results in the criterion variable.

From Table 3 it can be seen that there is a statistically significant correlation (Q = .00) between the system of predictive manifest motor variables and the criterion variable "throwing a handball from a sitting position", i.e. the coefficient of multiple correlation is .56 and explains the common variability. About 32%, and the remaining 68% in explaining the criterion variable can be attributed to other anthropological features. Based on the analysis of the impact of individual motor predictor variables, it can be concluded that the variables "20 meters from a high start", "coordination with a stick", "backwards" and "throwing a medical ball from a lying position" have the greatest and statistically significant impact.

Students - handball players with better general motor skills perform the third situational task more successfully. The greatest influence in the successful performance of this situational task had the predictor variable "throwing a medical ball from a lying position" and "running 20 meters". In the case of this situational variable, too, the explosive power, especially the power of the upper extremities, has a decisive influence in its successful performance. Maximum mobilization of the muscle units is necessary for the shortest possible time in order to act on the device in its movement in space. The students who performed the test "coordination with a stick" more successfully achieved lower results in the criterion variable.

Based on the obtained results, it can be concluded that the students - handball players who have a better level of motor skills perform the set situational tasks more successfully. Strength and coordination (the mechanism for structuring movements) have the greatest significance in the successful execution of the set tasks. That is why it is necessary to pay attention to these abilities in the training process as well as in the selection of young handball players. The results of the regression analysis indirectly indicated that the large body mass is an obstacle in the successful performance of the first two criterion variables ("running a ball between sticks" and "starting speed with a ball at 20 m"). Of course, the research would have had greater scientific value if the predictor system included variables that cover the entire bio motor space or even better the entire anthropological space, if more situational tasks were included that would represent all the features of the handball game.

Conclusion

From the obtained results it can be concluded that the system predictive manifest motor variables have a significant contribution to the success of the criterion variables. The results showed that students - handball players who possess better general motor skills, and especially strength, explosive strength and coordination, the ability to move the body quickly in space by changing direction-agility, strong abdominal muscles perform situational tasks more successfully. The results indirectly indicated that the large body mass is an obstacle for the successful execution of situational tasks that are characterized by rapid movement of the body in space ("slalom between sticks" and "starting speed with a ball at 20 m.). The results should be taken into account when planning and programming the training process, as well as in the selection of young handball players.

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