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Tests and norms for monitoring locomotor abilities in Slovenian soldiers

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Abstract

The article describes a basic model of testing locomotor abilities in Slovenian soldiers within the scope of sports education.

The assessment of locomotor abilities is carried out in educational centres and subsequently three times in tactical units. Measured is the initial state at the begin of military service, the intermediate state at the end of training in educational centres, and the final state in the last month of training in tactical units.

Described is the import of monitoring locomotor abilities and the main goals which we pursue in developing general combat preparedness based on the improvement of physical preparedness.

We get to know a general and concrete working model of locomotor abilities, and a set of measurement methods used to measure locomotor abilities.

The concluding part of the article deals with the evaluation of locomotor abilities in soldiers, which is carried out according to special methodological steps.

Introduction

Testing of physical performance capacity in Slovenian soldiers within the scope of sports education forms a basis for objective observation, control and evaluation of the effects of training intended to develop motor abilities.

The results of the monitoring of the abilities are also a basis for the analysis of the final findings concerning the improvement and final state of the physical performance capacity at the completion of the basic training.

1. The subject, problem and objectives of testing motor abilities in Slovenian soldiers

On the basis of the information obtained by the procedures of monitoring the motor abilities in Slovenian soldiers, it will be possible to set up adequate and efficient programmes of sports education as their rational and successful elaboration is possible only if sufficient data concerning the state of motor abilities are provided.

Based on the findings concerning the state of their own physical performance capacity, soldiers are able to follow more consciously their locomotor development by themselves and to participate self-initiatively and creatively in it.

2. Goals

Monitoring locomotor abilities in Slovenian soldiers has several objectives among which the most important are:

- To establish the level of development of motor abilities in the initial, intermediate (transitive) and end (final) state;
- To prepare a suitable programme of sports education with respect to the development state of motor abilities in individual soldiers or groups;
- To monitor own motor development with self-initiative and creative cooperation;
- To inform one's superiors about the state of motor preparedness of soldiers;
- To compare motor abilities among soldiers of various educational centres and to monitor the effects of sports education in individual environments;
- To set up a basic data base on the state of motor abilities in the young for the requirements of general national resistance and civil defence;
- To obtain a source of information for expert and research study of motor abilities in Slovenian soldiers;
- To select soldiers with best physical performance capacity for engagement in special training or various competitions;
- To select soldiers with very poorly developed motor abilities who are unlikely to successfully carry out particular special tasks included in general training;
- To set up a complex information system for monitoring the motor abilities in Slovenian soldiers.

3. Methods

3.1. A model for checking the motor abilities in Slovenian soldiers

If we look at the motorics with which the members of the armed forces are confronted and which they have to master (marches lasting several hours, short and medium-distance sprints with variation of movement direction, climbing with free and mixed hangs, creeping and crawling, throws, lifting and carrying, pulling and pushing), we can say that it is versatile and that it covers almost the entire range of natural movement forms. This motorics requires, in the first place, well developed energy potentials which reflect in movement capacities of the endurance type and in various manifestation forms of strength and speed. On the other hand, certain movements and movement tasks such as overcoming artificial and natural obstacles, handling the various objects and technical means require above all coordination abilities and good flexibility.

On the basis of the above said it is possible to define a model of motor abilities for the members of the armed forces in the Republic of Slovenia. The model covers the field of the control of energy, which is represented by explosive, repetitive and static strength, and aerobic endurance; and the field of the control of movement, which is defined in terms of the ability to carry out complex movement patterns, coordination of the arms, the frequency of alternating movements and flexibility. Hence, the model consists of four abilities of the energy type, and four abilities of the information type.

3.2. Battery of measurement procedures

The tests selected are, as instruments of measurement, the best indicators of individual motor abilities, established in several investigations and confirmed in practice.

The measurement battery selected to measure motor abilities in Slovenian soldiers consists of the following motor tests:

- TR : tapping with the hand (test for the measurement of the frequency of alternating movements)
- SDM : long jump from standing (test for the measurement of explosive power)
- VZG : bent arms hang (test for the measurement of static power)
- PRK : bending forward on bench (test for the measurement of flexibility)
- KVS : sideways steps (test for the measurement of ability to perform complex movement patterns)
- ZS : juggling with small boxes (test for the measurement of coordination of the arms)
- DT : sit-ups (test for the measurement of repetitive power)
- 2.400 M : 2.400-m-run (test for the measurement of aerobic endurance).

Measurements are, as a rule, carried out indoors (gym, larger classroom, adapted store room) with adequate lighting as only in this way comparable measurement conditions can be provided in all educational centres. An exception is the measurement of aerobic endurance with a 2.400-m-run test which takes place outdoors, on a running course. If it is not possible to organize measurements indoors, they are carried out outdoors.

3.3. Methodological procedures of evaluation and marking of locomotor abilities

The results achieved on individual tests are transformed into Z-values on the basis of the normal-distribution curve, where it is known that the tests having the Z-value exceeding 3 are extremely good or extremely bad dependent on the sign preceding them.

It is due to the sign and measurement scale which is not known in practice that we have used the transformed Z-scale which contains the same results or information presented in the manner which is much easier to understand in evaluating the results. We use marks from one to five which, similar as in school marking, show the physical performance of an individual; in addition, the results are also described with qualitative descriptive marks.

Mark		
5	EXCELLENT	+ 2 Z and more
4	VERY GOOD	+ 1 Z up to 1.99 Z
3	GOOD	0 Z up to 0.99 Z
- 2	SATISFACTORY	- 0.01 Z down to - 1.00 Z
1	UNSATISFACTORY	- 1.01 Z and less

4. Results, norms and marks for locomotor abilities

The norms of the results in motor tests are given in form of descriptive marks (EXCELLENT, VERY GOOD, SATISFACTORY, UNSATISFACTORY) and numeral marks with an interval from 0.00 up to 5.95.

Numerical marks are expressed with whole and decimal numbers, which allows more exact evaluation of the basic results and permits also mathematical operations.

Table No. 1 with norms and marks obtained on motor tests consists of five separate parts. Each part appertains to one of the physical performance marks obtained on the movement test. In the first part there is given a representation of the results (separately for each motor test) for the mark EXCELLENT, then there follow all other parts of the table down to the zone in which the results obtained are marked as UNSATISFACTORY. In the table, each motor test has a designation or code which identifies it, and a measure by which basic results are expressed. In individual columns there are given the values of raw results obtained in measurements.

However, for better understanding of the norming table, the following legend is applicable :

Column No. 1 : OPOCE - descriptive mark for motor abilities (EXCELLENT, VERY GOOD, GOOD, SATISFACTORY, UNSATISFACTORY)

Column No. 2 : NOCE - numerical mark for motor abilities (from 5 up to 5.95 the result is excellent, from 4 up to 4.99 the result is very good, from 3 up to 3.99 the result is good, from 2 up to 2.99 the result is satisfactory and below the mark 2.00 the result is unsatisfactory).

The following tables give the norms for monitoring the motor abilities in Slovenian soldiers.

MOTORICS

	CONTROL OF ENERGY				CONTROL OF MOVEMENT				
1 OPOCE	2 NOCE	3 SDM	4 VZG	5 DT	6 2400M	7 PRK	8 TR	9 KVS	10 ZS
		cm	s	rep.	m:s	cm	rep.	1/10s	rep
E	5.95	315	120	65	10:00	75	63	65	57
X	5.90	300	115	64	10:03	74	62		56
C	5.85	296	109	63	10:04	73	61	66	55
E	5.80	294	103	62	10:05	72	60		54
L	5.75	292	101	61	10:06	71		67	53
L	5.70	289	99	60	10:07	70	59		52
E	5.65	287	97	59	10:08	69		68	51
N	5.60	285	94	58	10:09	68	58	69	50
T	5.50	282	92	57	10:10	67		70	49
	5.40	280	90	56	10:11	66	57	71	48
	5.30	278	88	55	10:12	65		72	47
	5.20	276	86	54	10:13	64	56	73	46
	5.10	273	84	53	10:14	63		74	45
	5.00	270	82	52	10:15	62	55	75	44

	CONTROL OF ENERGY				CONTROL OF MOVEMENT				
1 OPOCE	2 NOCE	3 SDM	4 VZG	5 DT	6 2400M	7 PRK	8 TR	9 KVS	10 ZS
		cm	s	rep.	m:s	cm	rep.	1/10s	rep
V	4.95	296	81	51	10:16	61	54	76	43
G	4.90	266	79	50	10:29				
E O	4.80	264	77	49	10:42	60	53	77	42
O	4.70	262	75	48	10:55				
R D	4.60	259	73	47	11:08	59	52	78	41
	4.45	257	71	46	11:21				40
Y	4.30	255	69	45	11:34	58	51	79	39
	4.15	253	67	44	11:47				38
	4.00	251	65	43	12:00	57	50	80	37

	CONTROL OF ENERGY					CONTROL OF MOVEMENT			
1 OPOCE	2 NOCE	3 SDM	4 VZG	5 DT	6 2400M	7 PRK	8 TR	9 KVS	10 ZS
		cm	s	rep.	m:s	cm	rep.	1/10s	rep
	3.95	250	64	42	12:01	56	49	81	36
	3.90	248	62		12:10				
G	3.85	246	60	41	12:20	55	48	82	35
	3.80	243	58		12:30				
	3.75	241	56	40	12:40	54	47	83	34
O	3.70	239	53		12:60				
	3.65	236	51	39	12:80	53	46	83	33
	3.60	234	49		13:00				
O	3.50	230	45		13:20			84	32
	3.35	225	41	36	13:40				31
	3.30	223	39	35	13:60	50	43	85	30
D	3.25	220	37	34	13:80				29
	3.20	218	35	33	13:90	49	42	86	28
	3.15	216	33	32	14:00			87	27
	3.10	213	31	31	14:10	48	41	88	26
	3.05	211	29	30	14:20	47		89	

1 OPOCE	2 NOCE	3 SDM	4 VZG	5 DT	6 2400M	7 PRK	8 TR	9 KVS	10 ZS
S		cm	s	rep.	m:s	cm	rep.	1/10s	rep
A	2.90	207	27	28	14:31	45	39	91	24
T	2.80	204	25		14:60	44		92	23
I	2.70	202	23	27	14:80	43		93	22
S	2.60	200	21		15:00	42		94	21
F	2.50	197	19	26	15:20	41	38	95	20
A	2.40	195	17	25	15:50			96	19
C	2.20	193	15	24	15:80	40		97	18
T	2.10	190	13	23	16:00			98	17
	2.00	187	11	22	16:30	39	37	99	16

1 OPOCE	2 NOCE	3 SDM	4 VZG	5 DT	6 2400M	7 PRK	8 TR	9 KVS	10 ZS
		cm	s	rep.	m:s	cm	rep.	1/10s	rep
U	1.90	186	10	21	16:31	38	36	100	15
N	1.80	184	9	20	16:40	37		102	14
S	1.70	181	8	19	16:50	36		104	13
A	1.60	179	7	18	16:60			106	12
T	1.50	177	6	17	16:70	35	34	108	11
I	1.40	174	5	16	16:80			110	10
S	1.30	172	4	15	16:90	34		112	9
F	1.20	170	3		17:00	33		114	8
A	1.10	167	2	14	17:10	32	32	116	7
C	1.00	165	1		17:20			118	6
T	0.90	163	0	13	17:30	31		120	5
O	0.70	159		11	17:40	29		125	4
R	0.50	150		9	17:60	27		130	3
Y	0.30	140		4	17:80	20		140	2
	0.10	110		1	18:00	10	10	150	1

Elaboration of the profile of motor abilities

The profile of motor abilities does not only show the performance of an individual on the respective test, but also the overall physical performance capacities of Slovenian soldiers. The profile card is filled in accordance with a precisely prescribed procedure. First, the results of the motor tests are evaluated :

- we go to the Norm table No. 3;
- in the column for the respective test we look up the numerical value of the raw result;
- in the column NOCE we read the mark for the raw result and then in the column OPOCE we also read the descriptive mark.

First we calculate the performance in the control of energy (CONTROL OF ENERGY). The procedure of computation is carried out so that all marks are summed up and the obtained sum is divided by the number of marks. The mark is valid if the subject has received at least three individual marks. Here is an example for the subject who attained the following results :

Long jump : 4.40
Bent arms hang : 2.30
Sit-ups : 3.00
2400-m-run : 4.30

The sum of the marks is : 4.40 + 2.30 + 3.00 + 4.30 = 14.00

The obtained sum is divided by the number of marks, i.e. by 4 : 14.00/4 = 3.5.
The obtained mark 3.5. is entered into the respective window (CONTROL OF ENERGY).

The same is done with the control of movement (CONTROL OF MOVEMENT).

At the end we must compute the final motor performance (LOCOMOTOR MARK). This is carried out in such a way that the mark for the control of energy and the mark for the control of movement are summed up and the obtained sum is divided by 2. Example :

Mark for the control of energy = 3.5.
Mark for the control of movement = 4.0.

The sum of both marks is 3.5 + 4.0 = 7.5. the obtained sum is divided by 2 (7.5/2 = 3.75) and we obtain the final performance mark 3.75, which is entered in the respective window LOCOMOTOR MARK.

Into the window above the numerical mark we also enter the appertaining descriptive mark. In our example the numerical mark 3.75 means a descriptive mark GOOD, which means that the performance of the respective subject is evaluated as good.

5. Conclusion

Checking the motor abilities in soldiers is an indispensable constituent part of sports education and military training. The methods and means of sports education, where mastering of new motor knowledge and improvement of motor abilities is concerned, must be based on objectively assessed abilities of individuals. In the armed forces, the time at disposal is to little to allow unrational planning and execution of sports education. Sports education should be adapted so as to be as close as possible to the needs and demands of individuals, and the said is possible only if efficient checking and current evaluation of the obtained results is provided.

6. Bibliography

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