The sprinter athletes' new physiological criteria to predict their results during training and competitive periods

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ABSTRACT

To repeat the best results in competitions is one of the most vital issue for track-and-field sprinters . This paper is trying to investigate the new models that can predict sport-results and select the prospective athletes by physiology complex criteria.

Key words: track-and-field athletes, sprinters, physiological criteria, modern track-and-field.

INTRODUCTION: There is a considerable amount of research done on job involvement. Most of this research has been done in Western cultures. Previous research did not found positive impact of track-and-field sport results on performance of individual athletes. (Chernikova, 1937; Kuznetsov, 1967).

Objective of the Study: The current study aimed at investigating the modern physiology criteria of track-and- field athletes to predict their sport results and at making new models for developing their potential results according to their complex health rates.

DISCUSSION On the basis of it was found that hypothesis developed in this research study got significant support. The new criteria were implemented in, and the new prediction models were made.

One of the most vital trouble for the track-and-field athletes at preset times is that that they couldn't repeat their best results during the competitions. According to the authorities and present work gave the same statistics, 30% track-and-field athletes couldn't repeat their prise-results during the competitions and do their efforts with unstable marks. In the 20th century the unstable results could being predicted by "prelaunch fever" and "prelaunch apathy" (by Puni 1979).However, now, these marks are rare to be determined as the main mark that will show unstable or non-result . That is why the new marks are need to be found to predict sport results. These criteria are need to estimate the athletes' condition during the training and competitons periods. Mainly, the criteria should be based on the

athletes complex condition during these periods . The sprinters compare with long-distance runners have stronger shifts in their functional system, i.e. they may not show their best results during the competition and training periods. That is why it is so vital to analyze what are the main cases for these functional system's shifts.

The aim was to determine the new physiological criteria to predict the athletes' functional capacity results during the pre-launch conditions and to make the models for the sprinters during different competitive performance.

Methods:

We examined the sprinters athletes aged 12-21 years old. 90 sprinters took part in the research. All athletes participated in districts and citywide competitions. The sprinters' qualifications level was from 1st youth level to the master of sports.

The first day of the experiment. The athletes got the computer test to examine their nervous system and mental health. They also got the simple sensor monitor test to check up their reaction in time, tapping test, anxiety test, the test to determine the individual moments, dynamometers, stress test.

The second day. The athletes were tested by spiroarteriocardioritmografe (original record and 3 functional tests) rheograph and spirometry were used to measure the blood pressure by blood pressure monitor.

The first stage was held during autumn's preparing to the competitions period before the trainings from 3.30 to 5.00 o clock PM. The experiment's first day included computers programs to examine the athletes nervous systems , to determine the time of sensomotor reaction, tapping test, the anxiety level test, dynamometers, stress test, individual minute test. The following marks were fixed: age, sex, qualification, sport-career ages. The second day. The athletes were tested by spiroarteriocardioritmografe the 3 functional tests , the spirometry test was taken, Shtange and Gench test, the blood pressure was measured as well.

The second stage was held during the competitions period (the winter and summer-beginning periods).The experiment was taken one day. The 1st stage same tests were held at the same time but before the warming up training.

The third stage. The competitions day in the arena. The experiment was held during the warming up time and the complex points were estimated: skin condition, behavior, hand's tremor, mimics, nervous level, activity's level, voice speaking changes or stable . Befor 5 minutes to the start was taken the blood pressure and the pulse .

The physiological rates preparing period (calm)the track-and-field athletes 4 groups

Table 1.

Rates	1st group	2nd group	3rd group	4th group
	M±σ	M±σ	M±σ	M±σ
Anxiety level	16,1±7,9***	15,1±6,3	21,3±7,8	16,4±9,9
TP, ms²	4134,5±2402,5	3648,5±977	4246,2±2644,6	3390,3±1735,5
VLF, ms²	684,7±378,4	646,3±242,1	596,6±380,4	705,3±402,6
HF, ms²	2117±1769	1461,3±750,6	2363,1±2042,7	1483,7±972,3
TPS, mm²	29,1±15,5++	43,8±16,1***	21,8±12,8	36,9±19,3
VLFS, mm²	12,9±7,9++	20,5±6,8***	8,4±4,2	14,2±10,2
VLFD, mm²	8,7±5,8	12,1±8,5	10,3±8,3	10,5±6,8

The special rates of training preparation period for the track-and-field athletes in 4 groups

Table 2.

Rates	1st group	2nd group	3rd group	4th group
	M±σ	M±σ	M±σ	M±σ
TPS, mm²	22,2±11,7**(+++)	10,6±3****(***)	31,8±15,8****	52,6±18,5*
LFS, mm²	5,8±2,9++(***)	3,4±2****	11,1±6**	13,6±5,3*
HFS, mm²	5,4±4,8****	3±0,7****(+++)	5,6±3,4++++	10,2±6
TPD, mm²	16,2±8,1	10±2,3++++	16,2±8,8	15,8±6,3
VLFD, mm²	8,1±5,5++	3,3±1	6,7±4,8	7,9±4,3
LFD, mm²	6,3±3,9	5,9±1,7	7,5±4,5	6,3±2,9
LFD, n.u.	75,9±12,2++	87,6±2****	78,2±9,4++	77,8±4,6
HFD, mm²	1,4±1++	0,7±0,3++++	1,6±0,9++	1,4±0,5
HFD, n.u.	18,8±9,1++	10,6±2,5****	18±8,2++	18,9±4,4
LFD/HFD	5,7±4,1++	8,6±1,8****	5,6±3,3++	4,4±1,3

VLFSP, (l/m)²	2,4±1,6⁺⁺	3,1±0,8⁺⁺⁺⁺	2,6±0,9⁺⁺	2,3±0,6

The rates of training period for the track-and-field athletes in 4 groups

Table 3.

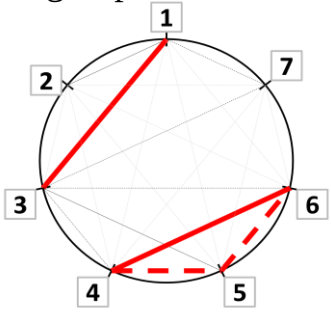
	1st group	2nd group	3rd group	4th group
Rates	M±σ	M±σ	M±σ	M±σ
TP, ms²	3862,2±1952,9⁺⁺⁺⁺	4541,3±2033,7	3596,3±1333,6	6248,7±3077,7
VLF, ms²	767,2±565,9	641,7±473,4	655,4±376,3	1405,8±947,3
HF, ms²	1689,3±1200,6	2575,7±1532,3	1482,7±657	2098,7±1864,8
LFD, n.u.	72±13,6	63,8±10,5	66,9±16,1	76,5±8,7
HFD, n.u.	22,9±11,3	26,2±5,2	26,8±13,3	20,4±7,7
LFD/HFD	4,2±2,3	2,5±0,8	3,4±2,1	4,3±1,8
Ti/(Te+Ti)	0,42±0,03	0,41±0,01	0,42±0,03	0,41±0,02

The results:

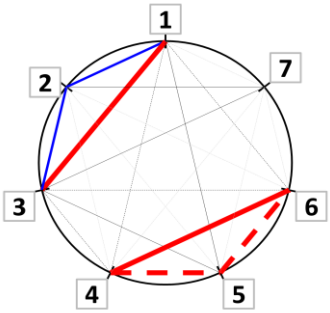
90 athletes were taken to 4 groups with different results level. The 1st group the athletes who show the better results during the competition period more than during the training period (50 athletes). The 2nd group the athletes who show stable results during the competitions and training both (9 athletes). The 3rd group the athletes who show unstable good and bad results during the competitive and train periods both (20 persons). The 4th group the athletes who show worse results during the competitions than during the training periods (11 persons).

The diagram of correlations in the 4 groups during the competition period.

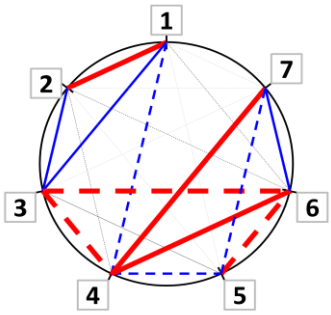
1st group rates



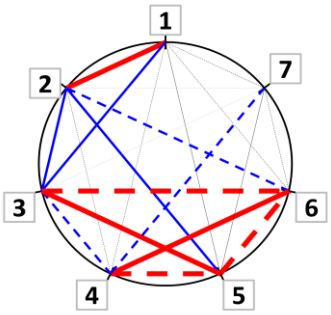
3rd group rates



2nd group rates



4th group rates



1 - TP, ms²,
2 - VLF, ms²,
3 - HF, ms²,
4 - LFD, n.u.,
5 - HFD, n.u.,
6 - LFD/HFD,
7 - Ti/(Te+Ti).

The 4th group has an increasing anxiety level from training to competitive period i.e. the nervous system's rate block them to do their best during the competitions. The 1st group has the stable nervous system's rate that's why they show their best during the competitions. The 2nd and 3rd groups had high level rates but the 2nd group of the sportsmen do their best during the competitions and the 3rd group's marks in tests shown that they often couldn't get ride of high anxiety level that is increasing unstable from training to competitive period. That is why they only partly may show good results during the competitions.

The results and repeating are the main thing for all 4 groups of sportsmen.

The experiment in the competitive period can select the athletes with good and bed results before placing each person to the team.

The correlation analysis had shown that the most successful athletes had weak correlation levels i.e. their nervous system is stable and stress less than the 3rd and 4th groups of the athletes with high correlation levels i.e. their nervous system is unstable and new methods are need to be found to help these athletes out to get their goals.

The intellectual multitask test helped out to select the prospective athletes during different periods, because the athletes needed to do multitask activity to solve the problem they were given. The same thing is going during each competition and training. That is why the prospective athletes are in advanced. The less prospective athletes are need coaching and tutoring to get the key.

The new models are to determine the sport results are need to include complex tests to distinguish the prospective athletes with different qualifications in different competitive and training periods.

CONCLUSION

There is a great need of new modern criteria to predict track-and-field athletes' results. The models of the 4 groups and the complex physiological criteria could show the prediction of the athletes results.

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