THE CHARACTERISTIC OF TRAINING LOADS OF JUNIORS DOING RACE WALKING

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Key words:
- training loads,
- race walking,
- track and fields.

Abstract:
In the thesis was presented training loads analysis of juniors training race walking. Currently presented the two basic elements of training loads, i.e. intensity and capacity in annual training period of a junior (athlete). The analysis was based on a set of accomplished training loads registered plans lasting one month and ranked as the one of the fourth training phase (transition, general preparation, special preparation, starting). In the research material we distinguished 88 monthly training plans realized by the group of 16 competitors. The main aim of the thesis is the analysis and the characteristic of the training loads dynamic realized by juniors training walking race.

INTRODUCTION

The sport result depends on many very important factors [7, 8]. One of those factors is the choice of the proper training loads values. The analysis of the training loads is mainly taken up in a measurable competitions. In many reports are presented the attempts of defining the dependency between the size of training loads and the finish result [1, 5, 6].

Walking race is the Olympic competition which made it's debut on the Olympic Games in London in 1908. We can include it to the endurance-technical competition. The training of a junior in this competition focus on the preparation to start on the distance of 3 and 5 km [3, 4]. It is usually realized every day or six times a week, which makes it similar to the training of an adult competitor. The literature about training loads of young athletes is rather poor. The majority of the thesis devoted to the training loads focus on the analysis of the training loads of the competitors on the high level of training [5, 10]. The detailed review of Polish literature connected to the walking race made Kisiel and Mirek [2]. According to those authors the majority of the thesis focus on the description of used means, methods and the conducted recruitment without searching the dependency or interaction.

The main aim of the thesis is the analysis and the characteristic of the training loads dynamic realized by juniors training walking race.

MATERIAL AND METHODS

The conducted analysis was realized on the basis of training loads of the competitors training walking race. The competitors trained in GUKLA Bratkowice and Resovia Rzeszów. Among the examined were the finalists of Polish Juniors Championships and Indoor Polish Juniors Championships. The training data were registered in the season 2011-2013 as the means and values of training loads. In the gathered material, according to the establishments [3], distinguished 11 training means. The material consists of the records from the annual training period in which there were distinguished four specific periods: transition period (TS), general preparation period (GPP), special preparation (SPP) and starting period (SP). Training

data were written down as the total of training loads realized during one month of the chosen training period. In the material there are 88 training samples realized by the group of 16 competitors. (tab.1).

Table 1. The characteristic of the examined group

Variable	***x***	***min***	***max***	***sd***	***V***
AGE [years]	18,5	16	23	3,5	19%
Height [cm]	172,7	167	186	7,3	4,2%
Mass [kg]	64,5	52	75	6,1	9,5%
Result on 3 km [s]	902,8	780	1155	84,9	9%
Result on 5 km [m:s]	23:05	22:10	25:12	4:17	18,5%

During the research registered the following training means:

- ORE- Overall running endurance
- OWE1- Overall walking endurance in 1 intensity range
- OWE2 - Overall walking endurance in 2 intensity range
- OWE3 - Overall walking endurance in 3 intensity range
- STE - Short tempo endurance
- MTE - Medium tempo endurance
- LTE - Long tempo endurance
- RHYTHM - Exercises forming technique (rhythm) of walking
- STRENGTH - Exercises forming muscle strength
- FITNESS - Exercises forming general fitness
- GIM- comprehensive exercises

To the OWE1 tasks belong creating the oxygen endurance of long time on the level 70% - 75% of the maximum pulse (HR_{max}) and the speed 3,3 – 3,87 m/s. This level answers to the training which is used several days before the start, as well as 2-3 days after the competition. OWE1 is used in every warm-up before OWE2 or before tempo endurance training (TE). OWE2 is the training mean which creates the endurance of a long time on the level of 75%-85% max. HR and the speed 3,78 – 3,87 m/s. This type of walking race endurance is to approximate the competitor to the starting model. Taking into account the energetic changes OWE2 is the work with more oxygen processes. We should also remember that we cannot use methods characterized as interrupted work. The specificity of constant walking is lost [3].

In some training units overall walking endurance in 3 intensity range OWE3 is used. Pulse in this case should be at the level of 85% - 95% max. OWE3 is usually used as the training accent and only among competitors who are prepared to high loads. It is introduced several weeks before competitions [3, 5].

Tempo endurance (STE, MTE, LTE) which is taken into consideration in the thesis can be identified with special endurance (SE). WS adjust to the planned starting distance. In such case we take into consideration the average speed at the distance as well as the planned time in which the competitor will cover the distance. We can distinguish three types of special endurance: short, medium and long. Mutual influence of those types is crucial. Using STE together with MTE leads to the development of speed endurance. Using LTE and MTE effects in gradual shifting the time endurance barrier [3].

Exercises forming technique of walking (RHYTMH) are used to the individualized mistake correction. We use the set of exercises focused on the development of movement co-ordination and the feeling of step rhythm. To the work at the technique it is recommended to

use a video camera what enables to diagnose the mistakes. Technique (RHYTMH) is often strongly connected to the warm-up, as well as it can be the main accent of the training [4].

Walking STRENGTH is a training which is usually integrated with such training means as OWE1 and OWE2 realized at the very diverse route. By aimed speed-up at some sections under the hill, we reach the effect of special power increase.

FITNESS is a group of training means which create the overall level of physical efficiency. This group of training means do not influence on the level of special order. The distinguished mean which has the similar character is gymnastic (GIM) describing comprehensive gymnastic exercises.

Statistical analysis was carried out on the basis of a statistical measure, i.e. arithmetic mean, minimal and maximal value, standard declination and variability coefficient. In addition, there was used an analysis variation (ANOVA) in order to define the relevance of differences in medium levels of a given training mean used in each of analyzed training stages. Taking into account the fact that not all means had the gausian character (normality of a schedule) and homogeneity variation, decided to use the next test of relevance Kruskal-Wallis as non-parametric equivalent of analysis variation [9].

RESULTS

In table 2 are presented the average values of loads used among juniors training walking race. Additionally, besides an average value there was presented a dispersion of an individual training means (V). Taking into account the analysis, we can assume that the size of used loads differ ($p<0,005$) in a chosen annual stages. With the exception of the group of training means which are responsible for medium tempo endurance (MTE),where the results of a parametric test show the lack of essential differences between the analyzed levels of that load. It is worth mentioned that this mean characterize by the highest inner group diversity ($V>100\%$). It results from that this mean was not used by each of examined competitors. Similar results were for STE after using parametric test which show that the medium levels of that mean do not differ in analyzed training stages ($p>0,05$). That means do not characterize such high dispersion as MTE.

Analyzing an individual inner human variation, we should notice that the lowest values have such training means as: ORE, FITNESS or GIM which shows the generality of those groups. The highest variation is in MTE and LTE which means that the special endurance is characterized by the high variation.

At figures 1,2,3 is presented the dynamic of analyzed training loads in the perspective of some stages. We can state that OWE1 values uniformly increase in the nest stage. In ORE, OWE2 and OWE3 there is slight increase of mentioned means. Very interesting dynamic is observed in LTE where there is violent increase of that mean in the period of special preparation. The other WT groups are characterized by moderate dynamic. Linear character of increase was noted down for GIM. STRENGTH and FITNESS have non-linear increase of values. It is also important that the training means connected with the power of walking are not used in the transient and staring period.

Table 2. The characteristic of training loads junior competitor (exactness to the 1 point after a comma)

Training mean	Period**	x	sd	min	max	V	p (ANOVA)	p (K-W)
ORE	**TP**	31.3	5.5	25	37	17%	**0.003***	**0.0001***
	GPP	25.3	12.1	0	56	48%		
	SPP	31.0	8.4	24	56	27%		
	SP	35.0	4.0	32	40	11%		
OWE1	**TP**	85.8	24.0	65	117	28%	**0.0001***	**0.0001***
	GPP	185.4	59.0	107	280	32%		
	SPP	224.3	67.4	144	304	30%		
	SP	242.8	80.9	99	360	33%		
OWE2	**TP**	2.0	2.2	0	4	**110%**	**0.0001***	**0.0001***
	GPP	32.3	18.9	11	64	58%		
	SPP	58.1	20.4	18	88	35%		
	SP	73.0	33.7	32	120	46%		
OWE3	**TP**	0.0	0.0	0	0	-	**0.0001***	**0.0001***
	GPP	1.6	1.6	0	5	**104%**		
	SPP	5.8	7.9	0	20	**135%**		
	SP	17.0	7.4	3	25	43%		
STE	**TP**	5.5	1.8	3	8	32%	**0.0001***	0.096
	GPP	7.8	5.3	0	24	68%		
	SPP	9.0	5.6	4	24	62%		
	SP	9.9	4.6	5	16	46%		
MTE	**TP**	1.3	2.1	0	4	**155%**	0.192	**0.0001***
	GPP	2.4	4.4	0	11	**183%**		
	SPP	8.3	9.9	0	32	**118%**		
	SP	13.6	3.6	8	16	26%		
LTE	**TP**	0.0	0.0	0	0	-	**0.0001***	**0.0001***
	GPP	0.0	0.0	0	0	-		
	SPP	19.0	22.0	0	56	**116%**		
	SP	24.3	6.0	16	32	25%		
RHYTMH	**TP**	0.0	0.0	0	0	-	**0.0001***	**0.0001***
	GPP	1.5	2.8	0	8	**190%**		
	SPP	4.3	3.1	0	8	72%		
	SP	7.9	2.4	4	12	30%		
STRENGTH	**TP**	0.0	0.0	0	0	-	**0.0001***	**0.0001***
	GPP	96.3	68.8	0	240	72%		
	SPP	140.0	48.3	80	240	34%		
	SP	0.0	0.0	0	0	-		
FITNESS	**TP**	281.7	41.9	205	320	15%	**0.0001***	**0.0001***
	GPP	503.1	76.2	360	620	15%		
	SPP	556.7	28.7	520	600	5%		
	SP	545.0	120.8	120	640	22%		
GIM	**TP**	208.3	30.6	150	240	15%	**0.0001***	**0.0001***
	GPP	280.4	63.9	195	360	23%		
	SPP	340.0	61.3	240	400	18%		
	SP	380.0	44.1	320	420	12%		

* - static relevance al the level of α=0.05

** - TP - transition period, GPP - general preparation period; SPP - special preparation period; SP - starting period.

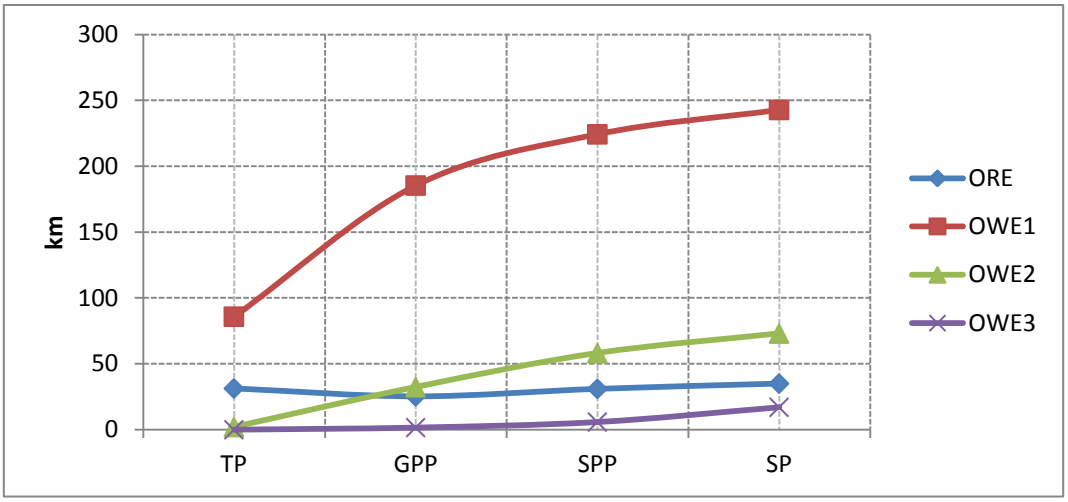

Figure 1. The average values of training means used (ORE, OWE1, OWE2, OWE3) by juniors training walking race.

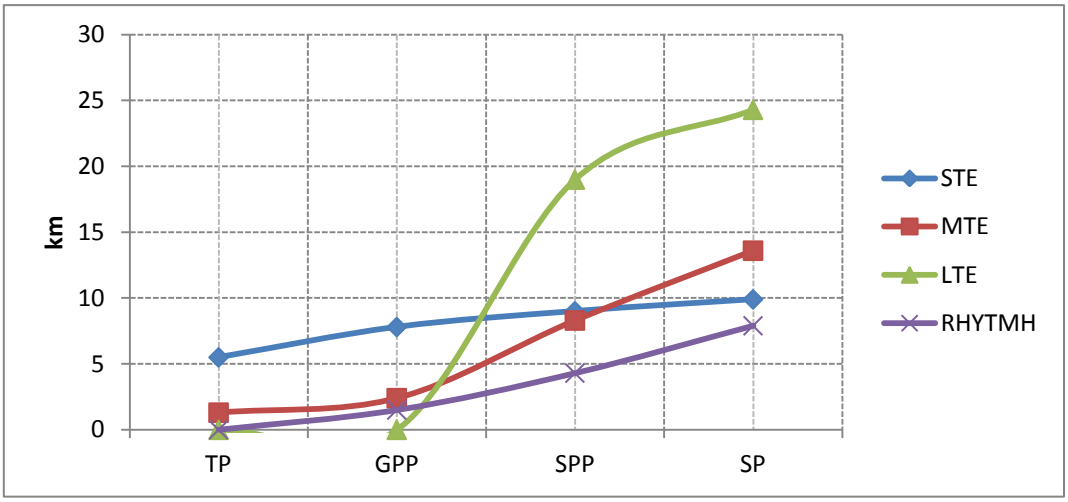

Figure 2. The average values of training means used (STE, MTE, LTE, RHYTMH) by juniors training walking race.

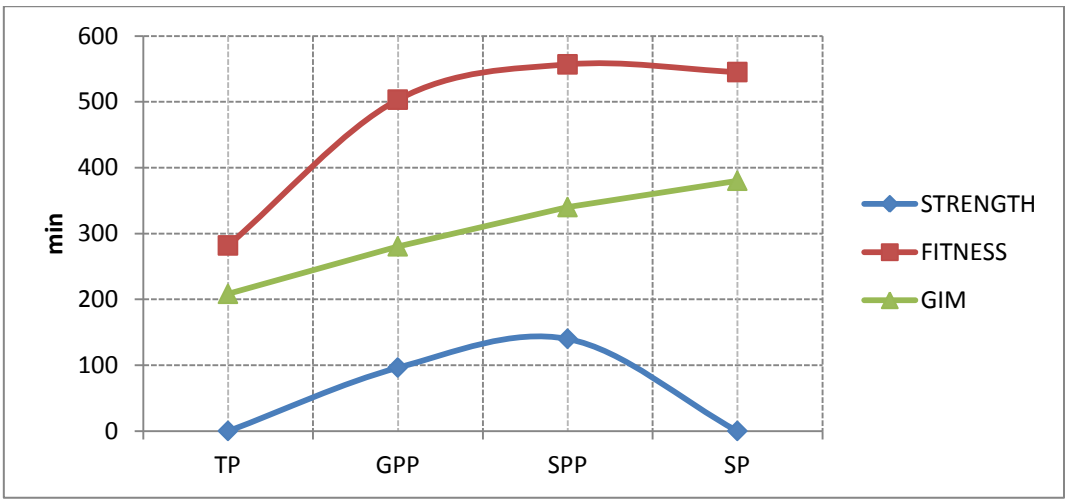

Figure 3. The average values of training means used (STRENGTH, FITNESS, GIM) by juniors training walking race.

SUMMARY

The analysis of juniors' training loads from podkarpackie district show that the volume of done work is mainly determined by the actual training period. Classification of an individual training loads enables us to estimate the volume and intensity of exercises in the sphere of examined training periods. Level differences of loads sizes used in an individual training period is characterized by the static relevance al the level of α=0.001. Exceptions were short tempo endurance and medium tempo endurance.

The next stage of the research is the analysis of training loads in the direction of their optimization. It will enable to support the training process which helps to gain better results by the examined group.

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