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TRAINING LOADS OF POLISH NATIONAL DISABLED ATHLETICS TEAM DURING PREPARATIONS FOR THE 2006 IPC ATHLETICS WORLD CHAMPIONSHIPS IN ASSEN

Key words: sport for the disabled, training loads, middle distance.

ABSTRACT

The aim of this study was to analyse a 12-month training cycle of a group of four disabled middle-distance runners, preceding the IPC Athletics World Championships in Assen. The athletes practised effectively for about 225 hours; their special preparation took up 81.4% of this time. The training was mainly focused on aerobic changes – 72.17% of the effective time. The dominating training means were continuous runs performed in the area of aerobic changes – 51.26%, and mixed – 18.71% of total loads (TR). The biggest amount of work was done by the athletes in the preparation period (11.05 – 4.06). Three athletes qualified for the World Championships in 800 and 1500 m runs. They managed to enter the finals in their class at the same time setting their personal best results. Reaching peak performance for the main season competition indicates that a training cycle was properly planned.

INTRODUCTION

An optimal preparation of an athlete for the most important season competition is possible when his or her coach has a good knowledge of the athlete's capabilities as well as of training methods and forms constituting the basis of sport success. In sport for both able-bodied and disabled people the most important competitions are the Olympic and Paralympic Games as well as the World Championships. Thus particular attention is paid to planning of an organizational training cycle preceding the competitions. A detailed analysis training assumptions and achievements make it possible to draw proper conclusions and help to optimize the training process.

As more and more people become interested in sport for the disabled, various aspects of training loads are being discussed and examined more often. An analysis of preparations for the 1992 Para-

lympic Games of a visually impaired pentathlete (medical classification B2, starting group T11/F11) was carried out by Rutkowska [8]. She noticed that too little attention was paid to the means of special preparation, especially during the pre-season and competition period, whereas more stress was put on the athlete's technical preparation. The study also suggested increasing the number of competition performances as well as systematic evaluation of an athlete's advancement level [8].

Rutkowska and Gruszczyński [9] conducted an analysis of a 12-month training cycle for the 1999 European Championships in Nottingham of a disabled pentathlete from the Polish national team. They authors paid attention to the fact that too few means of an oriented and special preparation are implemented in the training process. Furthermore, they suggested that total training loads as well as the number of competition performances preceding the main competition should be increased [9].

The problem discussed in another study was the amount of training loads in a 12-month preparation cycle of deaf Polish swimmers for the World Games for the Deaf [5]. As for the volume of swimming of varied intensity in the entire cycle, the 2nd range exercises (of aerobic character) were dominant. They constituted from 60 to 100% of the total volume. Moreover, an inversely proportional course of exercise dynamics in the 2nd and 3rd range (of a mixed character) of intensity was noticed, i.e. the increase in the volume of exercises performed in the 2nd range was accompanied by the decrease in the volume performed in the 3rd range and vice versa [5].

While analysing the preparations of disabled swimmers for the 1988 and 1992 Paralympic Games, Kosmol and Maniak found some training errors in the form of an incorrect training structure as well as the lack of regular training [4].

METHODS

The issues of training of the disabled have not been sufficiently explored in literature. This can stem from the specificity of disability conditioned by the stimuli affecting the body of a disabled athlete. These stimuli are different from those affecting the able-bodied persons. In trying to meet the expectations of coaches and instructors as well as for cognitive reasons, an analysis of the preparations of the Polish national disabled team athletes for the 2006 IPC Athletics World Championships in Assen were carried out. The research aimed to answer the following questions:

1. What was the structure of training loads used in the 2005/06 season?
2. What practical conclusions can be taken into consideration while preparing training plans?

The study examined a 12-month preparation cycle of four disabled (three visually impaired and one with hand paresis) middle-distance runners (800 and 1500 m) (Tab. 1) in the 2005/06 season, preceding the IPC Athletics World Championships. All subjects were trained by the same coach. The research method was based on the analysis of training documents which contained the training means together with the number of repetitions and ways of their application as well as the sports results. The TREOB 4 software was used for data processing [10].

The evaluation of energetic cost in athletics by Ważny (after Hollman and Hettinger, 1994),

which assumes that there exists a correlation between the time of effort and intensity, was also applied in the analysis [11].

The identification and classification of training means was made on the basis of the register of training means in middle- and long-distance running [10]. Sports results were calculated according to the IAAF scoring tables [12].

Table 1. The characteristics of the research sample

No.	Age (years)	Training experience (years)	Functional Classification	Body mass (kg)	Height (cm)
1.	20	5	T13	63	183
2.	18	5	T12	68	180
3.	20	5	T46	63	184
4.	22	5	T13	68	176

RESULTS

The structure of training loads

During the training period under study (Oct 29, 2005 – Sep 5, 2006), the disabled athletes performed 317 training sessions, which resulted in approximately 225 hours of effective work. During the 12-month preparation period the athletes spent altogether 65 days at five training camps, where they performed 97 training sessions. Data concerning the informative and energetic components of the training process are presented in Table 2. The means of special preparation were dominant in the training of middle-distance runners (81.4% of TR).

Table 2. Training loads applied in the season of 2005/2006 by the disabled athletes

	Informative area			Range of intensity				
	W	U	S	1	2	3	4	5
h: min: s	33:30:00	8:18:10	182:46:37	4:36:00	162:05:05	49:08:15	8:26:17	0:19:00
%	14.9	3.7	81.4	2.05	2.17	21.88	3.76	0.14
Energetic cost [%]				0	52	35	13	0

As for the energetic area, the training means realised in the 2nd range of intensity were dominant (72.17% of TR – aerobic changes). In the analysis of the energetic area considering the energy used to perform training tasks, the means realised in the 3rd intensity range (35% of TR – mixed changes) are becoming more important in comparison with the same parameter presented by means of the proportion of effective work time (21.88% of TR). The opposite situation takes place while comparing the proportion of means realised in the 2nd intensity range expressed by the effective work time (72.17%) and energetic cost (52%).

Continuous runs General Running Endurance (OWB) performed in the 2nd and 3rd intensity ranges (51.26% and 18.71% of TR, respectively) constituted the prevailing means in the training of the disabled. Within both means the athletes covered 2,456 km (1,850 in the 2nd and 606 in the 3rd intensity range) during the whole season. The biggest amount of work was done in the preparation period (Nov 05 – Apr 06), during which monthly values ranged from 180 to 270 km for OWB 2 and from 42 to 80 km for OWB 3 (Fig. 1). The dynamics of the above mentioned training means indicates two volume peaks: the first in the preparation period, followed by a decline (as the competition period approached), and the second after the Polish Championships for the Disabled. Before the World Championships the volume of training decreased. In both volume peaks we can observe an increase in the volume of means applied

in the 3rd intensity range alongside the decrease in the total volume of both training means. The presence of dominating training means in the preparation and competition periods is reflected in their dynamics. In the former the amount of means applied in the 2nd intensity range was 53.4% and in the 3rd range – 22.47% of TR, whereas in the competition period it was 49.07% and 22.47% of TR, respectively. The use of such means as continuous runs with a changing moderate intensity (preparation period 10.46%, performance period 1.94% of TR) as well as exercises of general fitness (8.14% of TR in the preparation period and 13.39% in the competition period) was also considerable.

Sports results in the 2005/2006 season

In the examined cycle the disabled athletes took part in ten competitions including the New Year's Eve Street Run, two indoor and seven outdoor competitions. Not all subjects took part in the same number of competitions; athlete 2 in 10 competitions, athletes 1 and 3 in 9 each, and athlete 4 in 3 competitions during the season. The IPC World Championships, which took place in Assen (the Netherlands) at the beginning of September, was the main season event. Four athletes took part in the preparations but only three of them were selected for the national team (athletes 1, 2, 3). The athletes were at a high performance level, which made it possible to assume that they would be well prepared for the competition (Table 3).

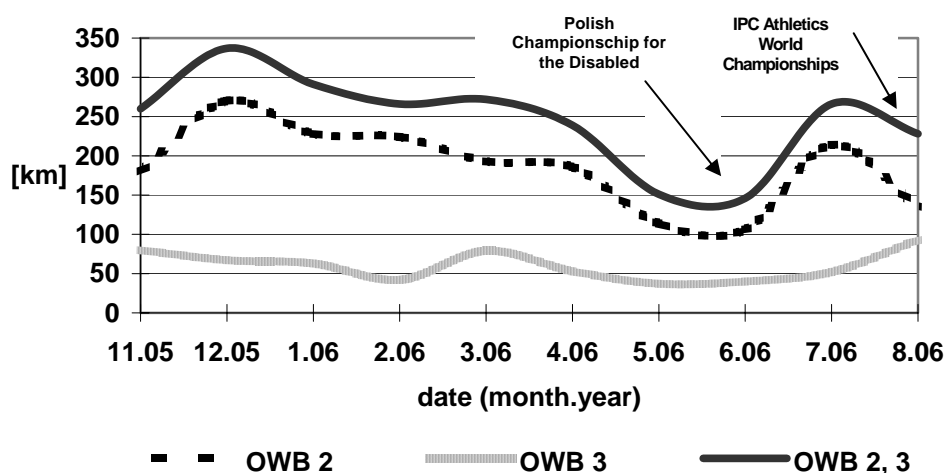


Figure 1. The dynamics of dominating training means applied by the disabled athletes in the season of 2005/06

Table 3. Relative values of personal best results of the disabled athletes for 800 and 1500 m races, expressed in percents of the world records for the disabled (valid on 2006-11-06, according to the IAAF scoring tables)

Competitor	800 m	1500 m
1	87.5	77.9
2	85.1	78.0
3	83.5	88.9
4	60.3	65.1

The Polish Championships for the Disabled, which took place at the end of June 2006, enabled the athletes to test their current level of sports performance. Each athlete won at least one medal. They took part in 800 and 1500 m races in their respective sports classes. In mid July athlete 3 took part in the Youth Polish Championships, winning silver medals in the 800 and 1500 m races. Three athletes from this group took part in the World Championships. Two of them (athletes 1 and 2) qualified for the finals in 800 and 1500 m races in their respective sports classes, winning the 8th and 6th places, respectively. Athlete 3 won the 6th place in the 800 m race, but he was only 9th in the 1500 m race, thus not qualifying for the final run. It is worth mentioning that athletes 2 and 3 set their personal best results (athlete 2 in 800 m race, athlete 3 in 1500 m race).

DISCUSSION

If the only criterion evaluating the effectiveness of the realised training cycle were the level of achievement of the assumed goals, we would have to state that there exists a connection between the assumptions and their fulfillment. Three athletes who were members of the national team qualified for the finals in the most important season event in the world. However, I believe that a more accurate analysis would be extremely essential for coaches in working out solutions applicable in sport for the disabled. The analysis of preparations for the World Championships concerned young athletes (18-22 years of age) who had been practicing sport for up to five years. Because of that it ought to be assumed that progress is a natural consequence of the training process. It is confirmed by the percentage differences between the best results from the 2006 and the 2005 season (Tab. 4). It is much more

difficult to maintain a high level of sports advancement in older athletes with a longer training experience, let alone a yearly result progress.

Table 4. Differences between the best results for 800 and 1500 m races in seasons 2005/2006 and 2004/2005 (expressed in percents, according to the IAAF scoring tables)

Competitor	800 m	1500 m
1	+ 8.8	+ 10.6
2	+ 7.3	0
3	+ 0.6	+ 11.4
4	- 9.3	- 1

All athletes qualified for the national team set new personal best records or maintained them at a similar level. The places taken by two athletes in the finals confirm that the training means and their intensity had been properly selected.

In sports training it is important to try to use means which will reflect the structure of movement in a particular event or its specificity in relation to performance conditions to a largest possible degree. In middle-distance running in performance conditions energy is supplied as a result of aerobic, mixed and anaerobic changes. According to Flex et al. [1993], proportions of these changes should be as follows: 70% aerobic, 20% mixed and 10% anaerobic [3]. Taking into account the proportions of energetic cost involvement used by the disabled athletes, it is discernable that they do not fully reflect the specificity of an event (52, 35 and 13% of TR) in particular intensity ranges. It seems similar when we separately analyse preparation and competition periods (55, 34, 11% of TR and 43, 39 and 16% of TR). The comparison of both periods indicates that an increase in training intensity in the competition period is noticeable.

The proportions of training realised in three intensity ranges (aerobic – 72%, mixed – 22% and anaerobic – 4% of TR) expressed by the effective time devoted to their realisation were similar to those referring to training by Spanish middle-distance runners (71, 21, 8% of TR) [2].

Considering the fact that the sample consisted of young athletes (18-22 years of age) in relation to the age at which maximal capacities in endurance running are obtained (24-25 in men) [6], it may be stated that from the standpoint of pro-

gressive training, according to which an increase in training volume may vary between 15-30% of the total volume season by season [7], a decline in the above mentioned parameter in comparison with the two previous seasons by 5 and 9% of the effective work time was noticed. Yet it ought to be noted that the preparation cycle for the 2006 IPC Athletics World Championships lasted 10 months, whereas for the 2005 11 months [1].

The analysis of training documents of the disabled middle-distance runners can yield the following conclusions:

1. The athletes' achievement of peak performance at the main sports competition of the season confirms that their training cycle had been properly planned.
2. A greater number of performances, especially before the main competition, as well as the increasing total training volume with an emphasis on the specificity of middle-distance running would contribute to achieving even better results.
3. The lack of differences in the energetic structure of training (expressed by the effective work time in particular intensity ranges) in able-bodied and disabled middle-distance runners indicates that it is possible to apply training concepts from sport for the able-bodied in training of the disabled.

REFERENCES

- [1] Bednarczuk G., Efektywność treningu wytrzymałościowego niepełnosprawnych średniodystansowców. (Effectiveness of endurance training in disabled middle-distance runners) (in press). (ed.) A. Kuder, D. Śledziwski, K. Perkowski, *Directions of improvement training and sports competition*. Warsaw 2006.
- [2] Esteve-Lanao J. (et al.), How Do Endurance Runners Actually Train? Relationship with Competition Performance. *Medicine & Science in Sports & Exercises*. 2005, vol. 37, no. 3, pp. 496-504.
- [3] Fox E.L. (et al.), *The Physiological Basis for Exercise and Sport*, Brown & Benchmark Pub, 5th edition, 1993.
- [4] Kosmol A., Maniak H., Training loads of Polish national team disabled swimmers during preparation for the 1988 and 1992 Paralympics. Monograph of CEEPUS Project No SI – 001 and CZ – 012, Olomouc 1998, p. 129.
- [5] Krawczyk Z., Krawczyk J., Kosmol A., Obciążenia wysiłkowe w rocznym cyklu przygotowań polskich pływaków niesłyszących do Światowych Igrzysk Głuchych. (Training loads in a one-year preparation period of Polish deaf swimmers for the World Games for the Deaf). *Sport in Rehabilitation. Polish Association of the Disabled*, Cracow 1999, pp. 77-87.
- [6] Maciantowicz J., Biegi wytrzymałościowe. (Endurance Runs), Trainer's Library, Main Training Centre, Warsaw 2000, 122 p.
- [7] Poliszczuk D.A., Sozański H., Planowanie treningu czteroletniego makrocyklu zawodników klasy mistrzowskiej. (Planning a four-year training macro-cycle in master-class competitors), *Podlasiian Physical Culture*, 2003, no. 1, pp. 3-7.
- [8] Rutkowska I., Szkolenie polskich lekkoatletów na przykładzie mistrza Igrzysk Paraolimpijskich '92 i '96. (Training of Polish athletes on the example of the 1992 and 1996 Paralympic winner), *Training* 1997, no. 4, pp. 129-143.
- [9] Rutkowska I., Gruszczyński K., Analiza rocznego cyklu szkolenia do Mistrzostw Europy zawodnika kadry paraolimpijskiej. (Analysis of a one-year training cycle of a Paralympic team competitor for the European Championships). (In:) H. Sozański, Effectiveness of training systems in various sports. Warsaw 2000, pp. 159-163.
- [10] Sozański H., Śledziwski D. (eds.), Dokumentowanie i opracowywanie danych (Data documentation and elaboration). Trainer's Library. Main Training Centre, Warsaw 1995.
- [11] Ważny Z., Rozważania nad trafnością oceny wielkości obciążeń treningowych. (Reflections on accurate assessment of training loads volume). Scientific Yearbook – official journal of the Josef Piłsudski University of Physical Education in Warsaw 1999, T. XXXVIII, pp. 203-215.