

New approach to preparation of elite judo athletes to main competition

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Summary

New approach to periodization for judo has been presented in the article because a number of competitions has increased in the last decades. Block periodization concept includes three mesocycles: accumulation, transmutation and realization. New principle is concentration of training workloads on a minimum number of abilities during one training session and shortening preparatory phases prior to main competition.

Introduction

According to traditional macrocycle training periodization the whole seasonal programme has been divided into smaller units; preparatory, competitive and transitional periods. [1].

Preparatory period consisted of general preparatory aiming at raising the level of general motor abilities, and special preparatory the goal of which was development of specific motor and technical abilities.

Competitive period included several national and international events and its purpose was further development of technical and tactical skills. Second part of competitive period was immediate precompetitive mesocycle targeting to achieve by competitors the highest readiness to main competition [2]. The

aim of transitional period was an active physical and emotional rest and recovery of the athletes after the macrocycle.

Such two-peak annual periodization existed in judo in the past determined by international calendar of the most prestigious competitions: in May European Judo Championships for Seniors and in the second half of the year: olympic games, world judo championships or Jigoro Kano Cup for men or International Fukuoka Tournament for Women.

After introducing qualification to main events in judo based on ranking list a number of international competitions increased sometimes over twice. Such trend has been observed not only in judo but also in other sports (Fig. 1).

Nowadays, elite judokas taking part in competition throughout the entire season and a remarkable increase in

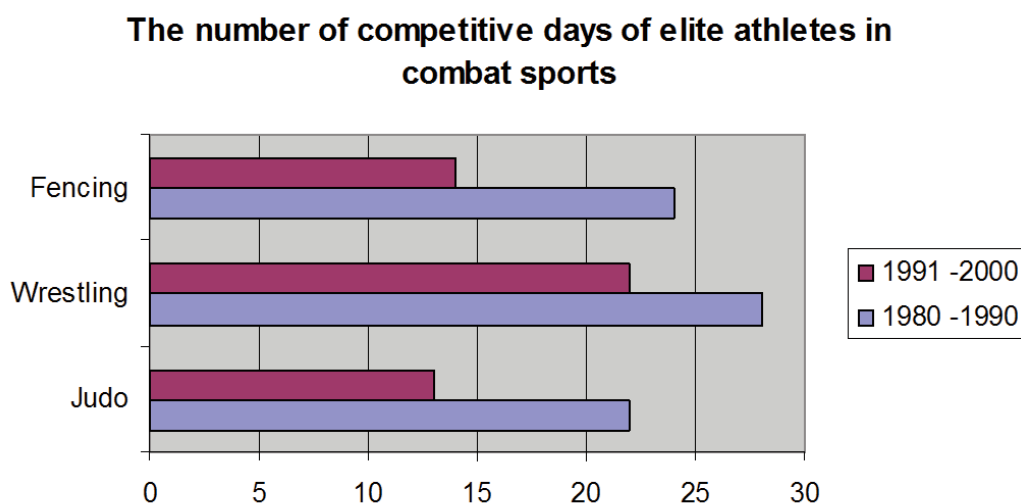


Fig. 1. The number of competitive days for elite athletes in judo, wrestling and fencing between years 1980-1990 and 1991-2000 [3]

the number of competitive days, during the whole year, has changed the concept of traditional approach to periodization of preparation to events.

Block periodization

Tremendous changes in judo in last decades connected with changing of the contest rules, increasing number of contests and competitions, decreasing number of training days have had a strong influence on the training process and way of preparation to important events.

High volume of training workloads was not possible, not useful, sometimes even harmful was replaced by higher intensity. Monitoring technologies: levels of blood lactate, hormones, enzymes, specific tests have made training process more effective.

Case study: the Polish Gold Olympic medalist in judo in 1996 prior to olympics took part only in three international tournaments: Paris 1-st place, Warsaw's Tournament 1-st place, European Championships 1-st place, and two Division events (winning all 22 contests). Twelve years later Gold Olympic medalists participated in seven to eleven competitions to get qualification to the Olympics.

Not only in judo but also in other sports increased a number of competitions, and decreased volume of time devoted to training between 1980 and 2000 year (Fig. 2).

The concept of BLOCK PERIODIZATION is based on three kinds of mesocycles: accumulation which is devoted to developing general aerobic endurance, increasing strength of muscle and general patterns of movement technique; transmutation mesocycle targeting is to develop special abilities like anaerobic endurance, strength endurance and individual technique; realization mesocycle is similar to Direct Precompetitive Period aiming at attaining by competitors maximum speed and readiness to competition [3]. It seems appropriate that such block periodization in judo should last: accumulation – three weeks to one month, transmutation – about 30 days, and realization -21 days [4].

During the **accumulation mesocycle** judokas aim to develop and renew basic motor abilities: aerobic-anaerobic endurance, strength endurance, explosive strength and individual technique. Workloads should be of high volume and medium intensity. Monitoring the level of abilities ought to be done at the beginning and at the end of the mesocycle. **The most important and new principle is concentration of training workloads on a minimum number of abilities during one training session to produce sufficient stimulus in an organism of high-level judokas.** Working on one motor ability during one training session a problem of detraining must be taken into consideration.

Developing one motor ability one should not lose another. The positive effects of training (residual) last after its cessation depending on its physiological background. Longest residual training effects last for 30 ± 5 days after working out high aerobic capacity, and shortest: 5 ± 3 days after gaining maximum speed (Table 1).

Transmutation mesocycle targets at developing specific abilities; special endurance, strength endurance and in individual technique combined with tactics during randori and shiai during training and in contests. Workloads should be of increased intensity and decreased volume. At the beginning of the mesocycle and at the end aerobic power of the judokas should be tested and values of lactic acid concentration in blood (LA), acid-base balance (BE), and hydrogen ions (pH) in 3rd and 30th minutes after tournament contests ought to be measured to define speed of recovery processes [5]. An example of a microcycle with two training sessions a day in transmutation phase is presented below.

Monday

1st training session

Load – substantial

Dominant training modality: anaerobic glycolytic power.

Main goal: improvement of technique (randori tachi-waza, intensive, short (3 min) with breaks 5 min between them (LA ≥ 12 mmol/l) or other exercise building up glycolytic power.

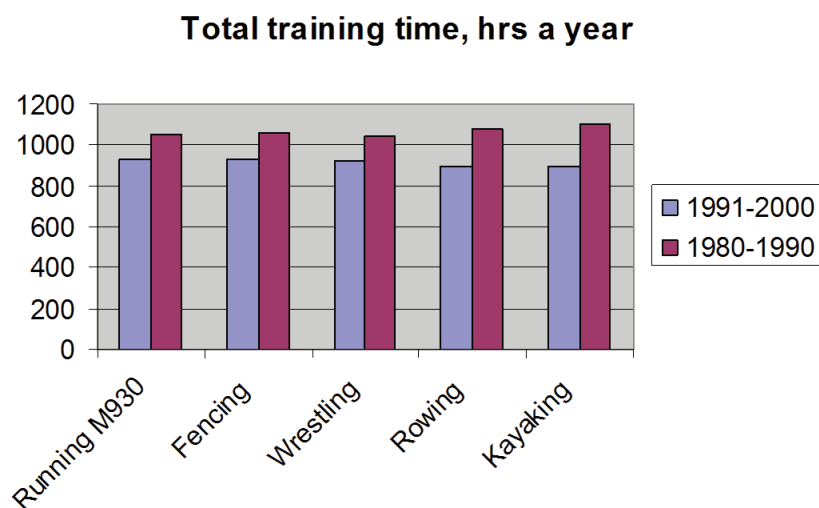


Fig. 2 Total training time in a year of elite athletes in various sports [3]

Table 1. Duration residual training effects for various motor abilities after cessation of training [3]

| Motor ability | Residual Duration days | Physiological background |
|---|------------------------|---|
| Aerobic endurance | 30 ± 5 | Increased amount of aerobic enzymes. Number of mitochondria. Muscle capillaries. Hemoglobin capacity. Glycogen storage and higher rate of fat metabolism. |
| Maximal strength | 30 ± 5 | Improvement of neural mechanism and Muscle hypertrophy due mainly to muscle Fiber enlargement. |
| Anaerobic glycolitic endurance – fundamental for judo | 18 ± 4 | Increased amount of anaerobic enzymes, Buffering capacity and glycogen storage and higher possibility of lactate accumulation. |
| Strength endurance | 15 ± 5 | Muscle hypertrophy mainly in slow-twitch fibres, improved aerobic-anaerobic enzymes, Better local blood circulation and lactic acid tolerance. |
| Maximal speed | 5 ± 3 | Improved neuro-muscular interactions and phosphocreatine storage. |

2nd training session
Load-medium

Dominant training modality: strength endurance.

Main goal: improvement of special strength (katame-waza – various exercises).

Tuesday
1st training session
Load – big

Dominant training modality: anaerobic glycolitic capacity (randori tachi-waza (5 min x 8) with 5 min breaks between them (above anaerobic threshold).

2nd training session
Load - low

Dominant training modality: active rest – aerobic: running stretching etc.

Wednesday
1st training session
Load - substantial

Dominant training modality: anaerobic glycolitic power – developing strength endurance.

Thursday
Load – big
1st training session

Dominant training modality: developing maximal strength.

2nd training session
Load – low

Dominant training modality: active rest – improvement of technique.

Friday
1st training session
Load – medium

Dominant training modality: alactate abilities: improvement of

technique and tactics in intensive manner (short bouts with longer breaks).

2nd training session
Load – big

Dominant training modality: anaerobic glycolitic power.

Main goal: improvement of technique (randori tachi-waza, intensive, short -3 min with 5 min breaks in between (LA ≤ 12 mmol/l).

Saturday
1st training session
Load – substantial

Dominant training modality: anaerobic glycolitic capacity – randori tachi-waza (5min x 8) with 5 min breaks between them (above anaerobic threshold).

Secondary training modality – development of maximal strength.

Sunday
Rest

The main goal of **realization mesocycle** is preparation of an athlete to most important competitions. During this pre-competitive named also tapering phase judokas concentrate on improvement of their tokui-waza (individual technique) and special speed in conditions similar to the contest. Specific training media are mostly applied at training sessions with full restoration in between. It is worth remembering that at realization mesocycle applied training workloads are dependent on the time of recovery which is quite long, 48-72 hrs after large and extreme endurance loads and comparatively shorter after medium and substantial loads (12 to 24 hrs). Therefore, particularly in this mesocycle inclusion of restoration workouts of low intensity, below anaerobic threshold, between high intensity training sessions are of great importance. Many sources reported an improvement in performance with the implementation of a reduced training load following heavy training [6,7,8].

At that time changes in level of hormones and enzymes (CK, T,C, LDH, AspAT, AIAT) should be monitored [1].

Case study. One of the first judokas whose preparation to the Olympic Games in Montreal 1976 could be compared to block periodization preparation was Russian Olympic champion W. Niewzorow. His first mesocycle lasted only six weeks up to 23rd March, 1976 USSR (Championships), the second mesocycle lasted from 24th March to 10th May, 1976 (European Championships). Next one from 11th May to 30th July (the Olympic Games) [9].

Conclusions

Lately, a number of competitions and financial motivation of top athletes have increased substantially. Therefore, a number of training days has decreased and more frequent competitions have changed the relationships between workload and recovery. Because of concentrated training demands a minimum number of sport specific abilities are developed consecutively, not simultaneously like before. Block periodization concept introduces three mesocycles: during first one judokas accumulate the basic motor and technical abilities; during second mesocycle they transmute their specific motor potential to preparedness to the competition; and in the last one judokas realize their preparation to achieve the best results.

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