



Structure of Meso- and Microcycles of the Preparatory Period in the Shooter Technical Training Program

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Abstract

Introduction: the article is devoted to the issues of sports training of shooters specializing in bullet shooting. The paper presents the means and methods of sports training and determines the load and amount of training effects on the athlete. *Purpose:* to confirm effectiveness of the bullet shooting training program for shooters by improving periodization of the training process. *Methods:* theoretical analysis of literary sources; methods of synthesis and generalization; the method of mathematical statistics is the nonparametric Man-Whitney criterion. *Results:* the annual cycle of shooting sports training traditionally contains three macrocycles, namely the preparatory, competitive and recovery periods. The main volume of training effects occurs during the preparatory period. Distribution of mesocycles and microcycles during the preparatory period helps regulate the volume and intensity of the means and methods of technical training. The ratio of the parameters of the training work of shooters determines the structure of the technical training program. At the end of the pedagogical experiment, the subjects of the experimental group demonstrated a mathematically reliable increase in the results of shooting at the control training compared with the control group. *Conclusion:* when planning sports training, it is necessary to determine the place of mesocycles in the preparatory period and the place of microcycles inside mesocycles, thus ensuring the effective choice of means and methods of influencing the athlete, amount of the load and its intensity.

Keywords: bullet shooting; technical training; preparatory period; periodization; sports cycles.

5.8.1. General pedagogy, history of pedagogy and education (pedagogical sciences).

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Introduction

Researchers consider the training process as structural units within which the effects on athletes are carried out [1–4]. Referring to the works of V.K. Bal'sevich, it is possible to formulate the basic rule of sports training, namely, the volume and intensity of training loads should correspond to current indicators of athletes' fitness and age [5].

The division of the training process into cycles is assigned to the section "periodization" of sports training [2]. In general, planning is necessary to prepare an athlete shooter for official competitions to achieve the highest indicators of athletic form [6]. When scheduling the training process, the coach relies on a calendar plan, a document that lists competitions at which the athlete will take part. It is approved at the end of the current year for the next year.

The need for periodization of sports training is determined by three phases of the development of competition form (formation, preservation and temporary loss) [7; 8].

The process of sports training has three periods:

- competitive – it is accompanied by peak values of sports form and is aimed at achieving the maximum sports result at official competitions;
- transitional – it starts at the end of the performance at competitions and is accompanied by a temporary loss of athletic form;
- preparatory – is characterized by the main impact on the athlete's body and the formation of athletic form (Figure 1).

The listed periods follow each other, have their own specific pedagogical tasks, which are solved as sports competitions approach [1].

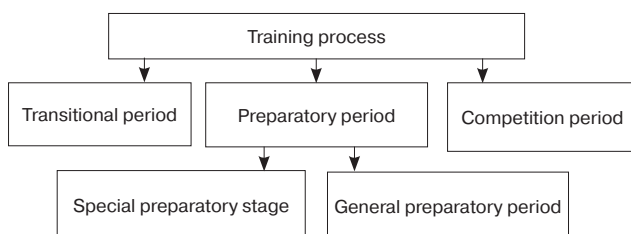


Figure 1. Periods and stages of the training process

The competitive period of sports training corresponds to the beginning of performance at official competitions. As a rule, this is one main start and 2–3 minor competitions. It is characterized by shooters' readiness to reach

the peak of competition form and high athletic performance. Distribution of the load volume and intensity is characterized by its undulation. The load intensity dynamics consists of short rises to the maximum (the last training sessions before the competition and the competition itself) and temporary declines (after official competitions), followed again by a gradual rise (if secondary competitions are planned after the main start). The load volume, remaining at the same level, does not change [2].

The main task of the period is to achieve high results in performance at the main competitions. The duration of this period in bullet shooting is up to 1 month, although its duration largely depends on the competition calendar [9].

The transition period is an integral part of any athletic training, including bullet shooting. It is the link between the end of the competitive period (performances at official competitions) and the beginning of the preparatory period (get fit for the next competitions). During this period, athletes use means of active recreation, general physical training and rehabilitation activities. The most acceptable means of influence: cycling, fishing, skiing, swimming, hiking, non-contact sports and outdoor games, massage, balneotherapy, etc. Means are chosen with regard to either on athletes' desire, or the objective state of their health (concomitant diseases and injuries) [2, 10].

A trainer should ensure the maximum possible restoration of energy forces of the body and athletes' performance after competitive loads. The optimal duration of the stage in bullet shooting is 1–1.5 months [9; 11].

In order to increase indicators of athletic fitness, it is the preparatory period that is most interesting. There are enough studies in the modern scientific and methodological literature confirming this fact [12–16]. The preparatory period in bullet shooting has a duration of up to 3 months and consists of 2 stages: general preparatory and special preparatory [9].

At the general preparatory stage, the tasks of the technical training process are limited to the study of new techniques of motor actions in the chosen sports discipline and the improvement of previously studied movements. The volume and intensity of the load increases evenly and reaches a peak by its end. The positive effect of training is achieved through the use of various

means. Athletes can participate in secondary competitions, practicing new techniques and correcting mistakes [14; 17].

During the special preparatory stage, the tasks of technical training change. Means of special technical training already occupy more than 70% of the total training time. On the one hand, the negative aspect is the decrease in the variety of available means. On the other hand, the trainer's task is to make the training interesting and diverse within the framework of motor actions of a competitive exercise [18].

The load on the athlete increases mainly due to an increase in its intensity. Before the start of the competition period, which is marked by official competitions, the intensity of the load exceeds its volume and reaches peak values. At the maximum intensity level, it is recommended to conduct no more than three training sessions before official competitions [7].

Thus, it can be concluded that it is the preparatory period that is fundamental in the process of sports training of an athlete. During this period, various influences are exerted on the athlete, motor qualities are developed, and technical skills are improved.

The span of the impact within each training period determines duration of the structure of training. According to L.P. Matveev, there are small cycles or microcycles, medium cycles or mesocycles and large cycles (macrocycles) [3].

The microstructure of the training process is a separate training session or a series of classes for a short time period (up to a week), where the same tasks are solved, and the overall goal of training is achieved using the same training tools. Depending on the volume and intensity of the load on athletes, they can be impact, lead-up, restoration, competition, volume, etc. [7].

Mesocycles are rather long (from 4 to 8 weeks) and their content consists of microcycles. Their logical sequence largely determines the athlete's training process. Regarding their directed impact on athletes, the means used and the scale of the load, they can be preparation, basic, competition, intensive, restoration, lead-up, control, pre-competition, etc.

Arrangement of mesocycles in the macrocycle depends, first of all, on the type of sport and on whether the sport is seasonal or year-round. According to the 5-year calendar of official competitions in bullet shooting [19], most pres-

tigious pneumatic weapons competitions are held in the autumn-winter period, while small-caliber weapons competitions – in the spring-summer period, and in autumn. At this time, a significant number of championships and Russian cups are held, which, due to comfortable weather conditions, take place on open shooting ranges [20].

Climatic features of Russian regions and a lack of open shooting ranges predispose to conducting training in a closed shooting range throughout the year. This fact negates the artificially created seasonality of bullet shooting [13].

The macrostructure of the training process implies longer periods of impact on the athlete's body. The one-year cycle of athletes' training is considered to be the longest (some authors also distinguish Olympic cycles). The structure of the large cycle contains mesocycles in a logical sequence relative to the tasks to be solved and the competition calendar.

When drawing up a training program for athletes, a number of methodological provisions should be taken into account. So, it is advisable to

- 1) occasionally revise its structural components during the training process;
- 2) change the content of cycles before control competitions;
- 3) rely on the athletic form development laws;
- 4) choose the content of mesocycles, volume and intensity of the load in accordance with the period of sports training.

Depending on the tasks of technical training and location in relation to the date of official competitions, mesocycles are divided into:

- 1) introduction – it is focused on preparing shooters for an increased load of special technical training. This mesocycles often starts with a microcycle of low load, and ends with a higher volume and increased intensity of load, thus contributing to the development of the shooter's athletic form;
- 2) basic – it is characterized by the predominant use of means aimed at active implementation of special technical actions, development of motor qualities necessary for the shooter, and enhancement of the athlete's comprehensive fitness;
- 3) control-preparatory – it ensures unification of the achieved indicators of athletes' technical readiness;

4) pre-competition – it is aimed at identifying and correcting deficiencies in equipment, errors in performing motor actions by the shooter. Special and contrasting microcycles can be used [9].

A prudent combination of mesocycles in the technical training program can significantly increase the effectiveness of performing a competitive bullet shooting exercise.

The content of mesocycles changes as official competitions approach. Each mesocycle consists of a number of small cycles. The duration of the microcycle varies from one training session to 7 days. The most common structure of planning the training process implies a duration of microcycles from 3 to 7 days.

There are the following types of microcycles:

1) introduction – it is characterized by a small volume and low intensity of the proposed load. Proposed exercises should be familiar to athletes and not difficult. The task of this cycle is to prepare the functional state of the athlete's body for a greater load in subsequent cycles. This microcycle, as a rule, opens a mesocycle.

2) impact or contrast – it is characterized by the greatest total volume and intensity of the load. In addition, athletes are offered to perform complex technical actions, including in adverse conditions and with the use of distractions. In this microcycle, the athlete's body acquires adaptability to the load [14].

3) restoration or fasting – it often finalizes a series of impact or competition microcycles in the training process. Gradual reduction in the load and use of outdoor activities contributes to the creation of favorable conditions for recovery processes in the shooter's body [18].

4) lead-up or specialized – it is used to create conditions close to the upcoming competitions and aimed at preparing shooters to perform in them. Means of performing a control shooting exercise or means aimed at solving the issues of restoring the psychological state of athletes are used.

5) competition – it is based on the program of official bullet shooting competitions. However, in addition to competitive shooting disciplines in which the athlete performs, it may also contain restorative means of rehabilitation.

Scientific and methodological literature also presents microcycles, such as basic general preparatory, basic special, control-preparatory, model, etc. [1; 3; 4].

The last training session in a weekly microcycle does not necessarily have to be conducted with the use of shooting exercises with weapons. To boost emotional intensity of lessons, V.A. Kinl' recommends using sports and outdoor games, exercises from other sports [9].

When drawing up the structure of athletes' training, researchers rely on the duration of the calendar week, because this is most effectively combined with the organization of labor and educational activities of the institution in which training is conducted. The content of microcycles, in turn, is based on the following factors: level of development of physical and technical readiness of shooters, gender and age of athletes, and nature of the tasks set.

Thus, there is no single and universal structure of both meso- and microcycles. Different combination of them can enhance athletes' results. A creative approach to the choice of exercises, changes in the regime of loads and rest, reliance on indicators of physical and technical readiness will ensure an increase in training of shooters at each training stage.

Organization of research

During the pedagogical experiment, a technical training program with the associated development of coordination abilities of young shooters in meso- and microcycles of the preparatory period was introduced into the educational process of the Vologda Youth Sports School. The experiment included athletes of training groups, aged 14–17 years who had a sports category not lower than 2 in the 40 meter rifle shooting. Only young men took part in the study. The sample size was 24 people. The athletes were divided into two groups – control and experimental, 12 people each.

At the stages of the preparatory period, we used all types of mesocycles. Each mesocycle is formed on average from 2 to 5 microcycles.

In the general preparatory stage of the preparatory period, three mesocycles were included: preparatory, basic and control-preparatory (Figure 2).

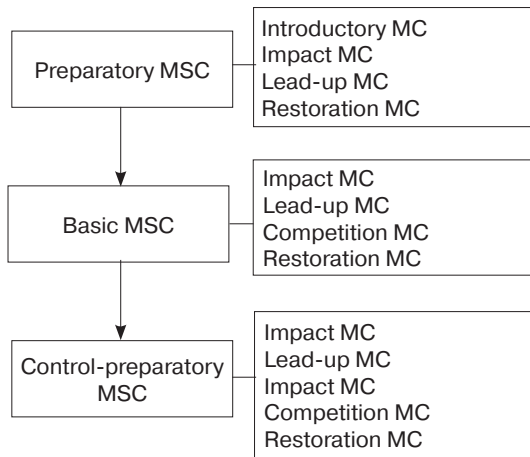


Figure 2. Scheme of building the training process at the general preparatory stage of the preparatory period

Alternation of mesocycles at the special preparatory stage of the preparatory period was as follows: basic, pre-competition and two control-preparatory (Figure 3).

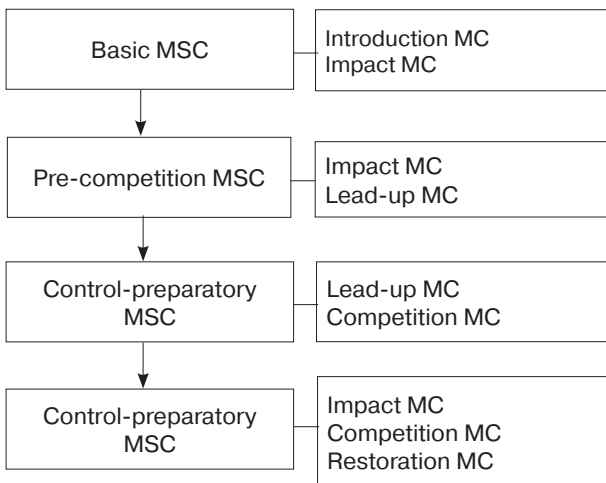


Figure 3. Scheme of the construction of the training process at the special preparatory stage of the preparatory period

Results

The effectiveness of the implemented program was tested during a control exercise – the 40-meter rifle shooting. The control exercise was carried out before the start of the experiment and at its end; shooting results were recorded in both cases (figures 4 and 5).

Applying the nonparametric Man-Whitney criterion and using indicators of the control group, the authors obtained the following results: U empirical (65), U critical (42, at $p < 0.05$); therefore, the differences were not statistically significant.

The analysis of individual performance indicators of shooters shows the improvement in shooting among only 5 athletes at the end of the experiment.

Considering indicators of the experimental group, we used the nonparametric Man-Whitney criterion and found out the following: U empirical equaled to 42 and U critical – 42, at $p \leq 0.05$. Therefore, the differences were not statistically veracious.

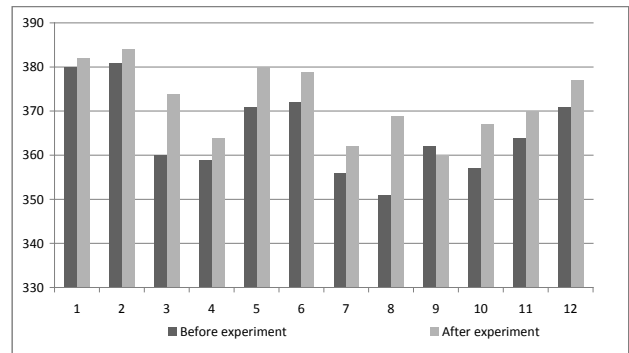


Figure 4. Results of the control training in the control group

The analysis of individual performance indicators of shooters in the experimental group reveals an improvement in shooting among 11 athletes at the end of the experiment.

In general, when comparing average results of control and experimental groups after the experiment, the following results were obtained: U empirical equaled to 39.5, U critical – 42, at $p \leq 0.05$. Thus, a statistically reliable result was obtained by the end of the experiment.

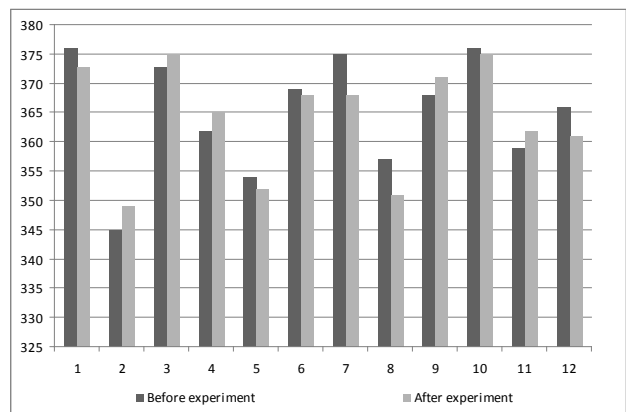


Figure 5. Results of the control training in the experimental group

Thus, in the course of our research there was a rise in shooting results in the experimental group. The technical training program was in-

troduced into the training process, coordination abilities of young shooters were developed in meso- and microcycles of the preparatory period. The reliability of the growth in the results is confirmed by the mathematical statistics method when comparing control and experimental groups before and after the experiment.

Conclusion

So, the planning of the training process is described. Periods of a sports training session are specified. It is revealed that during the preparatory period, the shooter is subject to various impacts aimed at developing motor qualities and improving technical skills of producing

shots. Meso- and microstructures of the bullet shooting preparatory period are described.

The experiment shows that the developed technical training program with the associated development of coordination abilities of young shooters in meso- and microcycles of the preparatory period has a positive effect on the process of sports training, enhancing shooting results. The program is a strictly organized structure of meso- and microcycles in the preparatory period, the content of which is based on the means and methods of technical training, taking into account the alternation of loads and rest.

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