INFLUENCE OF EXTRA TRAINING MEANS ON EFFECTIVENESS OF FENCERS' TECHNICAL TACTIC ACTIONS

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Abstract. *Purpose:* to determine influence of the worked out extra training means' complex on effectiveness of realization of elite sportsmen's competition functioning components. *Material:* in the research 12 fencers participated. The researches were conducted in the morning, against the background of organism's recreation. Before sportsmen's duel we applied two types of pre-competition warming up: traditional and experimental. Video recording was fulfilled with video camera Samsung HMX-S15. *Results:* we calculated volume, effectiveness and efficiency of sportsmen's actions in fights with different opponents and in different situations of duel. We showed possibility of extra training complexes' application, oriented on mobilization of workability in the process of direct pre-start preparation of elite sportsmen. Such exercises considered main actions and organism's typical responses in the process of competition functioning. *Conclusions:* Consideration of typolical (for fencing) organism's responses and peculiarities of competition functioning structure influence positively on indicators of sportsmen's competition functioning.
Key words: martial arts, fencing, training, extra training means, competition.

Introduction

Great number of modern researches point at the fact that in constantly increasing intensity of training and competition functioning still greater importance is acquired by extra competition and extra training means of sports training [9, 11, 12, 20-24]. Consequently, the problem of sportsmen's training effectiveness increase at the account of extra training means' application is not new for fencing [5, 10, 17, 24-29]. In the works of different authors there are rather effective approaches to application of extra training means for workability recreation in elite fencers.

In the works by Mirzoyev O.M. theoretical aspects and general principles of recreational means' application in sports training are presented. There it is also noted that preliminary application of recreational means facilitates significant increase of elite sportsmen's pre competition training's effectiveness. The author analyzes influence of different recreational means on elite fencers' special physical fitness and organism's functional state [10].

Tishler D.A. and Mocshovich A.D. studied application of extra training means in sports training in fencing. The authors noted that fencing training and participation in competitions differ by significant specific load on sportsmen's organism. It conditions demand in active application of recreational means and methodic, which consider specific features of kind of sports. The authors give methodic recommendations about peculiarities of extra training means' application, as means of recreation of lost workability after significant physical and mental loads [18, 19]. But these authors do not regard possibility of extra training means' application for workability stimulation during competitions and their influence on effectiveness of technical tactic actions' realization.

Some means of fencers' pre start training effectiveness increase are given in works by Levashov P.N. The author studied influence of typical warming up in combination with massage and mini bath "Termica" on indicators of targeted accuracy and dynamic of fencers' workability indicators [5].

It should be noted to large extent the mentioned approaches are oriented on application of physical and pedagogic recreational methods in period of after effects of great training and competition loads. With it [5] there are nearly no researches of extra training means influence on special workability and effectiveness of elite sportsmen's competition functioning in fencing.

In our previous researches we worked out special complex of extra training means, which were used instead of traditional pre-competition warming up of fencers. The worked out by us complex of extra training means consists, mainly, of exercises with partner, accompanied by special breathing mode. In exercises sportsman overcomes resistance, which can vary in wide range and adapt to potentials of sportsman's muscles. The received in previous researches data witness about positive influence of the worked out complex of extra training means on nervous and cardio-respiratory systems' indicators [6, 7, 8]. This fact served as the basis for checking of experimental complex's effectiveness in conditions, which simulated competition functioning in fencing.

Hypothesis: application of extra training means in pre start training can increase effectiveness of realization of elite sportsmen-fencers' main technical tactic actions.

The purpose of the research was to determine influence of the worked out extra training means' complex on effectiveness of realization of elite sportsmen-fencers' competition functioning components.

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Material and methods

Participants: in the research 12 fencers participated (6 international masters of sports of Ukraine, 6 masters of sports of Ukraine in fencing) of age from 19 to 24 years. All sportsmen gave their consent for participation in experiment.

Organization of the research: in the research we used sequential experiment. In this experiment we created conditions, which simulate competition functioning in fencing. In these standard conditions group of sportsmen fulfilled control and experimental program of training. The researches were conducted in the morning, against the background of organism's recreation.

In control part of experiment the fencers fulfilled traditional pre competition warming up. After warming up they conducted two duels for 15 shots with 20 minutes rest intervals between duels. The fight consisted of three periods (of three minutes' duration with 1 minute interval between periods). After three days (before duels) sportsmen, instead of traditional pre competition warming up, fulfilled experimental complex of pre start impacts.

As a result of the researches we assessed effectiveness of fencing competition functioning. Effectiveness of attacking, defensive and counter attacking actions was assessed with the help of registration of all fighting actions. We calculated volume, effectiveness and efficiency of sportsmen's actions in duels with different opponents and in different duels' situations.

To receive objective indicators of competition functioning we used video recording [4]. Video registration of fencers' technical tactic actions was fulfilled with camera Samsung HMX-S15. Video materials were analyzed with the help of computer program Light Allow in slow mode and stop-shot.

Statistical analysis: for determination of statistical significance of distinctions between indicators of fencers' competition actions' effectiveness we used non parametrical criteria for small samples (Wilkinson's test). We adopted level of significance $p = 0.05$ [4]. Statistical processing of data was fulfilled with computer program Stitistica 10.

Results of the research

To determine influence of the worked out extra training means' complex on effectiveness of realization of elite sportsmen's competition functioning we conducted sequential experiment. In experiment we simulated conditions of pre start training and competition functioning with application and without application of extra training means' complex. We calculated effectiveness of attacking, defensive and counter attacking actions of sportsmen in fights with different opponents and in different duel's situations [13].

Analysis of research's results showed (see table 1) that under influence of experimental complex attacking actions' effectiveness increased by 6.8% ($p < 0.05$) in the first duel and by 6.6% ($p < 0.05$) in the second duel. It should be noted that attacking actions' effectiveness in the second duel was by 4.8% ($p < 0.05$) higher than in the first duel after traditional warming up. It witnesses that special workability of fencers after application of experimental complex was higher that after traditional warming up (including in conditions of increasing fatigue).

In duel fencers use great number of fakes and tricks, combined with different maneuvering. It conditions great volume of opponent's defensive actions. Indicators of defensive actions of experimental group sportsmen exceed 50%. Though, effectiveness of such actions is not more than 20%. It witnesses that in responses to opponent's fake or actual actions sportsmen fulfilled defensive actions only to avoid shot in response. In this connection, after exercises of pre start control and experimental complexes we considered effective only those actions, after which responsive shot was realized.

In table 1 we see that application of experimental impacts resulted in increase of defensive actions in first duel by 6.6% ($p<0.05$) and in the second duel – by 6.8% ($p<0.05$).

Table 1. Indicators of competition functioning of elite fencers (n = 12)

Kind of competition actions	Effectiveness of fencers' competition functioning, %			
	After traditional warming up		After complex of pre start impacts	
	Duel 1	Duel 2	Duel 1	Duel 2
Attacking actions	29.5	27.7	36.3*	34.3*
Defensive actions	18.4	17.2	25*	24*
Counter attacking actions	50.2	48.5	56.5*	54.6*

Notes: * - distinctions are statistically significant, comparing with data, received after traditional warming up ($p < 0.05$).

Comparative analysis of counter attacking actions' effectiveness showed that after experimental complex the mentioned effectiveness increased by 6.3% ($p<0.05$) in first duel and by 6.1% ($p<0.05$) in second duel.

Besides, we analyzed accuracy of shots during experiment. Results of this analysis witness (see table 2) that under influence of experimental complex increase of shot accuracy by 5.6% ($p <0.05$) during first fight and by 7.5% ($p <0.05$) in second duel was registered.

We found that after application of pre start impacts' complex, in first duel rapier-fencers made not valid shots by 2.6 less. In second duel sportsmen made not valid shots by 2.9 less than after traditional warming up.

Table 2. Indicators of shots' accuracy of elite fencers

Statistical indicators	**Indicators of shots' accuracy, %**			
	After traditional warming up (n = 12)		**After complex of pre start impacts (n = 12)**	
	Duel 1	**Duel 2**	**Duel 1**	**Duel 2**
$\overline{x}$	65	61.4	70.6 *	68.9 *
S	10.8	13.5	7.7	12.6

Notes:* – distinctions are statistically significant, comparing with data, received after traditional warming up ($p <0.05$).

It witnesses that after complex of pre start impacts indicators of fencers' special workability were higher than after traditional warming up.

Discussion

As a result of systemizing of scientific-methodic literature data we can conclude: application of extra training means is the most significant reserve of sportsman's new potentials in extreme conditions of motor functioning, typical for elite sports. The main condition of extra training means' application is compliance of its orientation with specificities of training functioning provisioning in this kind of sports [9, 12]. It is directly connected with theory and practice of fencing training, where competition functioning is connected with special fitness's highly specialized components.

At present, in theory of sports certain system of extra training means, oriented on simulation and recreation of workability has been formed. In special literature there are data, showing effectiveness of application of specially worked out stimulating extra training means in different kinds of sports [2, 12, and 14]. Effect of such means' application in a number of kinds of sports creates pre conditions for development and implementation in practice of extra training impacts, oriented on stimulation of special workability and pre start training effectiveness increase in elite fencing.

In the process of our researches we worked out the complex of extra training impacts, oriented on stimulation of special workability and pre start training effectiveness increase in fencing. The complex was developed on the basis of selection and generalization of information about structure, content and orientation of special extra training exercises. Such exercises considered main actions and typical responses of fencer's organism in the process of competition functioning.

The conducted research proved results of a number of authors, who dealt with complex and rational usage of training and extra training means in system of sports training, which result in increase of competition functioning effectiveness in the whole [1, 2, 3, 12, 15].

We supplemented the data about modern approaches to optimization of elite sportsmen's pre start training in fencing with the help of extra training means [5, 17, 18, and 20].

Materials of our research supplement theoretical principles, devoted to rational organization of pre competition and competition functioning of elite sportsmen in martial arts [14, 15].

In our research, for the first time the data about influence of extra training means' complex on effectiveness of elite fencers' technical tactic actions were received.

Besides, when comparing results of the researches, attention should be paid to the fact that under influence of experimental complex means indicators of fencers' competition functioning was higher, than after application of traditional warming up. More over, they were the same even under increasing fatigue. The received results witness

that the offered by us complex of extra training means increases effectiveness of pre start warming up and increase effectiveness of competition functioning in the whole.

The promising direction of our researches is working out of new extra training means, oriented on simulation of workability in fencing (between duels). Besides, it seems to be important to work out recommendations for application of extra training means, oriented on stimulation of workability in training for increase of specific character and depth of load's influence.

Conclusions:

1. We have shown possibility of extra training means complexes' application for mobilization of workability in the process of elite sportsmen's direct pre start training.
2. As a result of the researches we found that consideration of organism's typical (for fencing) responses and specific features of competition functioning structure positively influenced on indicators of sportsmen's competition functioning. With it, confident ($p<0.05$) improvement of sportsmen's main technical tactic actions and accuracy of shots were registered.

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Conflict of interests

The author declares that there is no conflict of interests.

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