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Improving fencers' theoretical training based on the stage reached in their basic development

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Key words: fencing, theoretical training, means, game, preparedness

Abstract

Background. The research was devoted to theoretical training based on the stage reached in the basic development in fencing. Analysis of the literature shows that one way to improve the quality of a young fencer's training process is to validate the structure and content of theoretical training and assess the significance of its components to the stage of the fencer's previous basic development in the sport.

Problem and aim. The issue of the theoretical training of fencers is only mentioned fragmentally, which points to the absence of any one approach to its realization at different stages of an individual's long-term development. There is a need for a quantitative and qualitative increase in information transfer, and the acquisition of specific quality theoretical knowledge, particularly by using different methods and means of theoretical training.

Methods. Theoretical analysis and synthesis, analysis of documentary material, comparison, abstraction, methods of induction and deduction, expert assessment, pedagogical experiment.

Results and Conclusions**.** An author-developed program of theoretical training for solving set tasks there was established and implemented by using algorithmic educational and entertaining means. The pedagogical experiment, which consisted of two periods of four months, enabled us to determine the greater effectiveness of the author program of theoretical training in comparison with the generally-accepted one. There was determined that using the universal algorithmic educational and entertaining means – simulator "TTT"; "Associations"; and "Puzzles" – will lead to an improvement in the theoretical preparedness of fencers at the stage of previous basic development within different informational blocks.

Introduction

Rational and scientifically substantiated training system involves gaining athletes' knowledge and skills aimed at solving tasks of various training components that are closely interrelated [Matveev 2001; Platonov 2004]. Therefore, the initial link in improving any aspect of preparedness is to master special theoretical knowledge that determines not only the ability of an athlete to perform operational analysis during competitive activities, but also the willingness to independently manage the training process [Buylina, Kuramshina 1980].

On the one hand, definition of theoretical training in the scientific literature is often compared with the term "intellectual training" [Ashmarin 1978; Tyshler 1997]. In particular, Matveev [2001] and Pityn [2013] argue that theoretical training should develop the intellectual ability of the athlete associated with the formation of tactical thinking, analytical activity in the process of training sessions and competitions. At the same time getting knowledge on the content of sports training, technique and tactics, components of physical preparedness such as types of sensorimotor responses and fencing tempo [Borysiuk, Cynarski 2009] and ways of its improvement are also essential. On the other hand, Tyshler [1997] emphasizes the presence of causal relationships between the level of education in the field of physical culture and sports and the effectiveness of sports activities.

Analysis of scientific literature on the training process of athletes indicated wide representation of works which review the aspects of the effectiveness of technical and tactical skills in competitive activities, improvement of general and special physical preparedness at different stages of long-term training, diagnosing mental qualities [Czajkowski 2011; Borysiuk, Pakosz 2011; Busol 2011; Smyrnovskyy 2014]. Moreover, the issue of theoretical training of athletes is mentioned fragmentally [Strokatov, Tretilova, Andriievskii 1978; Buylina, Kuramshina 1980], which indicates absence of one approach in its realization at different stages of long-term development. Despite this fact, there is emphasized the need for quantitative and qualitative increase in information transfer and quality acquirement of specific theoretical knowledge of a chosen kind of sport, which confirms actuality of research in this direction.

Connection with academic programs, plans, themes. The research is planned according to themes 2.8 "Improvement of training of athletes in individual sports groups". Consolidated Plan research in the field of physical culture and sports in 2011-2015 the Ministry of Education, Youth and Sports of Ukraine.

The aim of research was to improve of structure and components of theoretical training at the stage reached in the basic development in fencing.

Methods. Due to the lack of a unified approach to the systematization of the information necessary for a fencer to conduct productive sports activities, there was held an expert assessment. It was aimed at determining the significance of the formation of knowledge from different informational blocks at the stage of previous basic development in fencing and the use of different methods for their study. Expert assessment was held from 04.12.2012 to 31.01.2013 during training sessions of four fencing clubs in Lviv. The number of experts was 20. Their average experience was almost 20 years.

To test the effectiveness of the author-developed program, a pedagogical experiment was conducted. There were participating 52 fencers at the stage of previous basic development, who were divided into two groups: experimental (n = 27) and control (n = 25). Pedagogical experiment was held at four fencing clubs in Lviv. However, it consisted of two parts. The first one was held from 01.02.2013 to 31.05.2013, the second one – from 09.09.2013 to 20.12.2013.

The level of theoretical preparedness of athletes was determined by authors' questionnaire [Briskin, Pityn, Zadorozhna, Smyrnovskyy 2014] which included five blocks of questions.

Theoretical analysis and synthesis, comparison, abstraction, methods of induction and deduction, analysis of documentary material were used for getting information about problems or theoretical training in fencing. Particularly, analysis of documentary material (program for fencing clubs) made it possible to discover the lack of means and methods of theoretical training during different stages of long-term development.

Results

It was established that the choice of methods of theoretical training differs depending on the stage of long-term development. Thus, high-qualified sportsmen should be taught by analysis, discussion and explanation, demonstration and experts' practice. In addition, young sportsmen are recommended to study theory of sport by guidance and recommendations, demonstration, conducting of fragments of training sessions by athletes. The analysis of the concordance coefficients allowed to establish a sufficient consistency of expert opinion on the implementation of theoretical training through the use of verbal and visual methods – $W > 0.6$.

The results of the expert accession also made it possible for the first time to obtain scientific data on the importance of forming theoretical preparedness in five information blocks. Those blocks included: "History of fencing", "Competitive activity", "Technique and tactics", "Fundamentals of the theory and methodology of training", "Olympism". It has been established that the level of significance of all components (information blocks) at the stage of reached in the basic development in fencing ranges from 3.2 to 3.35 points.

For the first time scientific data on the significance of the sections of the theoretical material and the priority of their study within different information blocks have been obtained. Thus, the accented consideration within the information blocks requires the following sections:

— "History of fencing" – "Famous figures in fencing", "Development of fencing in Ukraine and the world" (4.0 and 3.9 points respectively);
— "Competitive activities of fencing" – "Rules and Judging", "Features of the systems of conducting competitions" (respectively 4.0 and 3.9 points);
— "Technique and tactics of fencing" – "Varieties of technical actions and the basics of tactics of the fight" (3,5 points);
— "Theory athlete's training" – "Safety engineering and prevention of injuries in fencing" (4.2 points);
— Olympism – "Olympic Ukraine" (3.75 points).

The obtained results indicated the need to develop new approaches to the implementation of theoretical training, which would enable to raise the qualitative level of the transfer of theoretical material in the training process in fencing.

On the basis of the obtained data, an author-developed program of theoretical training of fencers at the stage of reached in the basic development with the use of algorithmic educational-game tools was developed. The methodological basis of the author program was the fundamental research on the training system of ath-

letes, documents, as well as data from previous studies.

To test the effectiveness of the author's program, a pedagogical experiment was conducted. There were participating 52 fencers at the stage of previous basic development, who were divided into two groups: experimental (n = 27) and control (n = 25).

Pedagogical experiment was held at four fencing clubs in Lviv. However, it consisted of two parts. The first one was held from 01.02.2013 to 31.05.2013, the second one– from 09.09.2013 to 20.12.2013.

During the pedagogical experiment, the fencers of the experimental group used the author's program of theoretical training, while the athletes of the control group – the generally accepted. The basis of the author's program of theoretical training was the use of such algorithmic training games with modified information blocks: "Puzzle", "Algorithmic way of theoretical training in sports", "Anagram", "Association", "Say something differently", "Duel", "Show stories", "Brain-ring", "Encoder", "Guess the word", a set of training games "Fencing positions" and "TTT" simulator. The peculiarity of the proposed means was the focus not only on raising the level of theoretical readiness, but also on the development of logical, associative and tactical thinking, the formation of motivation for purposeful multi-year improvement, stimulation of cognitive activity of athletes.

In order to reveal the growth of the theoretical preparedness of athletes of both groups there were used four tests: before the pedagogical experiment (from 03.12.2012 to 01.01.2013), after the first stage (from 01.06.13 to 27.06.13), before the start of the second stage (from 15.08.13 to 08.09.13) and after it (from 21.12.13 to 20.01.14). To assess the level of theoretical preparedness of athletes, a 10-point scale was used.

We would like to mention that before the beginning of the first stage of the pedagogical experiment, statistically significant differences between the levels of the theoretical preparedness of the experimental and control group athletes were revealed regarding the theoretical preparedness within the information block "Technique and tactics of fencing" ($p > 0,05$), the initial level of which was higher in the control group. Therefore, by the beginning of the second stage of the pedagogical experiment, statistically significant differences between the levels of the theoretical preparedness of the athletes of both groups were found for all information blocks ($p > 0.05$)

It was established that the implementation of the first stage of the pedagogical experiment contributed to a significant ($p<0.05$) increase in the level of theoretical preparedness of the experimental group at all 35.4-72.7 % of the information blocks. Moreover, the most average growth of level of theoretical preparedness was recorded within the information block "Technique and tactics of fencing" – by 72.7 %.

At the same time, in the control group by the end of the first stage of the pedagogical experiment, an increase in the theoretical readiness within the limits of one information blocks was accompanied by their decrease compared to others. Thus, the positive growth of the theoretical readiness of athletes in this group ($p <0.05$) was recorded within the blocks "History of fencing" and "Competitive activity of fencer" by 3.6 % and 9.3 %. On the other hand, the level of theoretical preparedness within other information blocks decreased by 4.0-11.3 %, however, the reliable ($p <0.05$) decrease was only within the information block "Olympism".

The average level of theoretical preparedness within all information blocks based on the results of the first stage of the pedagogical experiment was higher in the experimental group by 1.9-2.6 points in comparison with the control group. We suppose that this could be connected with the discrepancy of the means used in the control group and indicates the need of changing the ways of theoretical training.

Nevertheless, the results of the testing carried out after the completion of the second stage of the pedagogical experiment illustrated positive changes in the levels of the theoretical preparedness of the fencers of both groups. Particularly, in the experimental group the increase in the level of theoretical preparedness within the various information blocks was 21.9 -37.1% ($p <0.05$), in the control group – from 8.3 to 24.4%. It is interesting that the highest growth rates of theoretical preparedness in both groups were available within the blocks "History of fencing" and "Theory of athlete's training". Despite that fact, the levels of theoretical preparedness within those blocks were higher in the experimental group – by 37.1% and 35.2%, while in the control group – by 24.4 % and 23.5 %.

Thus, according to the results of the pedagogical experiment, the growth of the theoretical preparedness in the experimental group within different information blocks ranged from 48.3 to 145.5 %. The most significant growth of those levels was within the information block "Technique and tactics of fencing" – 145.5%.

In the control group, the positive growth of the theoretical preparedness was only available in blocks "History of fencing", "Technique and tactics of fencing" and "Fundamentals of the theory and methodology of training of athletes" – from 10.5 to 18.6 %. It should be mentioned that the level within the information block "Olympism" remained constant, while within the block "Competitive activity" it decreased by 7,1 %. The greatest increase in the theoretical preparedness in the control group was recorded within the information block "History of fencing" – by 18.6 %.

Discussion

The obtained data made it possible for the first time to determine not only the effectiveness of the author-devel-

oped program of theoretical training based on the use of algorithmic equipment in general, but also the priority of them in the formation of theoretical preparedness within different information blocks. In comparison, programs for fencing clubs [Strokatov, Tretilova, Andriievskii 1978; Buylina, Kuramshina 1980; Busol 2011] are based on using a short list of methods such as discussion, analysis, referee practice and lessons. Despite that fact, modern technologies such as online game means are not mentioned at all.

Thus, in the first part of the experimental program of theoretical training of fencers within different issues in particular information blocks there were used from one to three algorithmic game means, among others – their complex. According to the results of the first stage of the pedagogical experiment, it was found that the most effective among different information blocks were the following combinations:

— "History of fencing" – "Associations" and "Puzzles", "Associations" and "Encoders";
— "Competitive activity of fencing" – "Associations", "Encoder", "Puzzles" and "Brain-ring";
— "Technique and tactics of fencing" – "Associations", "Anagram" and "Brain-ring";
— "Theory of athlete's training" – "Associations", "Guess the word" and "Duel", "Say it differently";
— "Olympism" – "Puzzle", "Association" and "Anagram".

In addition, in the second part of the experimental program for the formation of theoretical preparedness within all information blocks there were used from one to three combinations of algorithmic game means. There were determined the most effective combinations within learning the material of different information blocks:

— "History of fencing" – "Puzzle", "Duel", "Associations" and "TTT" simulator;
— "Competitive activity of a fencer" – "Say something differently", "Association", "Algorithmic way of theoretical training in sports" and "TTT " simulator;
— "Technique and tactics of fencing" – "Anagram"", "TTT" simulator, "Algorithmic way of theoretical training in sports" and "Fencing positions";
— "Theory of athlete's training" – "Say differently " and "Duel";
— "Olympism" – "Associations" and "TTT " simulator.

In the nutshell, we would like to mention that according to the results of the two stages of the pedagogical experiment, the most universal algorithmic game means that should be used in forming the theoretical preparedness within all information blocks were the "Puzzle", "Associations" and the simulator "TTT". However, it was confirmed by the increase of the theoretical preparedness of the experimental group within the various information blocks by 48.3-145.5 % ($p < 0.05$). At the same time, other means of theoretical training require complex application.

Conclusions

1. There is a need to improve the way of presenting theoretical material through the use of different groups of methods at various stages of long-term development in fencing. In the early stages of training among the verbal methods the most significant are stories and explanations, while for adult sportsmen – analysis and discussion, guidance and recommendations.
2. The program of theoretical training of fencers on the stage reached in the basic development should be implemented in a complex manner, which is confirmed by the presence of insignificant differences (in the range of up to 0.15 points, $p<0.05$) within information blocks "History of fencing", "Competitive activity of a fencer", "Technique and tactics of fencing" and "Theory of athlete's training".

At the stage reached by fencers in their basic development, there was established a need to supplement the structure and content of the theoretical training with the information block "Olympism", the confirmation of which was an indicator of significance 3.2 points. The content of this block should be systematized in issues: "Olympic Games of Ancient Greece", "International Olympic System", "Olympic Ukraine", "Problems in modern Olympic sport".

3. The priority of the content of the information blocks of the theoretical training in fencing is caused by significantly different ($p<0.05$) indicators: in the block "History of fencing" – the component "Famous figures in fencing", "Development of fencing in Ukraine and the world"; in the block "Competitive activity of a fencer" – the component "Rules and Judiciary", "Features of the systems of competitions"; in the block "Technique and tactics of fencing" – the component "Varieties of technical actions", "Basics of tactics of the fight"; in the block "Theory of athlete's training" – components "Safety engineering and prevention of injuries in fencing"; in the block "Olympism" – components of the Olympic Movement in Ukraine.
4. To form the theoretical preparedness at the stage reached in the basic development there is recommended using the author-developed program, based on implementation of algorithmic game means with modified information blocks "History of fencing", "Competitive activity of a fencer", "Technique and tactics of fencing", "Theory of athlete's training" and "Olympism".
5. The effectiveness of the author program of theoretical training in fencing at the stage reached in the basic development has been confirmed by a significant increase ($p<0,05$) of the theoretical preparedness of the fencers in the experimental group in comparison with the control group: within the information block "History of fencing" – by 88,7% ($p < 0.05$), "Competitive activity of a fencer" – by 55.5% ($p<0.05$),

"Engineering and tactics of fencing" – by 129.5 % ($p<0.05$), "Theory of athlete's training" – by 117,6% ($p<0,05$) and "Olympism" – by 72,3% ($p<0,05$).

6. Improvement of all components of the theoretical preparedness in fencing at the stage of reached in the basic development is recommended through the use of algorithmic training games – "Association", "Puzzle" and "TTT" simulator. It is also possible to combine them with other means in studying the material on different information blocks, which is confirmed by an increase in the indexes of the experimental group at 48.3-145.5 % ($p<0.05$).

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Poprawa teoretycznego szkolenia sportowców na podstawie wcześniejszych postępów w szermierce

Słowa kluczowe: szermierka, trening teoretyczny, środki, gra, gotowość.

Streszczenie

Tło. Badania zostały poświęcone teoretycznym treningom w szermierce opartym na etapie osiągniętym w podstawowym stadium rozwoju sportowego. Analiza literatury pozwoliła odkryć, że jednym ze sposobów poprawy jakości procesu uczenia się młodych szermierzy jest uzasadnienie struktury i treści treningu teoretycznego oraz znaczenia jego składników na etapie wcześniejszego podstawowego szkolenia w szermierce.
Problem i cel. Kwestia teoretycznego szkolenia sportowców w szermierce pojawia się literaturze przedmiotu fragmentarycznie, co wskazuje na brak jednego podejścia w jego realizacji na różnych etapach długotrwałego rozwoju. Istnieje potrzeba ilościowego i jakościowego zwiększenia transferu informacji i jakościowego zdobywania określonej wiedzy teoretycznej, w szczególności z wykorzystaniem różnych metod i środków szkolenia teoretycznego.
Metody. W badaniu wykorzystano różne metody: analizę i syntezę teoretyczna, analizę materiału dokumentalnego, porównanie, abstrakcję, metody indukcji i dedukcji, ocenę ekspercką oraz eksperyment pedagogiczny.
Wyniki i wnioski. W celu rozwiązania ustalonych zadań ustanowiono i wdrożono autorski program szkolenia teoretycznego z wykorzystaniem algorytmicznych środków edukacyjnych oraz gier i zabaw. Eksperyment pedagogiczny, który składał się z dwóch okresów po cztery miesiące, pozwolił określić najskuteczniejszy autorski program szkolenia teoretycznego w porównaniu z ogólnie przyjętym. Ustalono, że uniwersalnymi algorytmicznymi środkami edukacyjnymi i rozrywkowymi są: symulator „TTT", „Skojarzenia", „Puzzle" – w celu poprawy przygotowania teoretycznego szermierzy na etapie podstawowego szkolenia w ramach różnych bloków informacyjnych.