

## KINESIOLOGY & COACHING

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## Differentiation of technical and tactical training of epee fencers with the account of weapon control

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**Key words:** fencing, differentiation, methods of weapon control, technical and tactical training

### Abstract

**Background.** The evolution of competitive activities in fencing have given rise to the development of a system of training for competitive activities. Since it has proved impossible to increase the volume and intensity of the practice load for fencers, the problem of finding new ways and provisions to improve various aspects of fencers' proficiency has cropped up. In the development of fencing several different ways of weapon control have been developed in epee fencing, which involve the application of the French or pistol grip. At present the number of epee fencers in the top 16 world ranking who have applied the French hilt during the last 6 years make up 34 % of both males and females.

**Problem and aim.** Until recently the sports scientists in this country have failed to broach the subject of weapon control in epee fencing at the appropriate level, while fencer training systems take no account of the specificity of weapon control. The aim of the study is the improvement of the technical and tactical training of epee fencers by means of differentiation of weapon control.

**Methods.** The following methods were used: theoretical analysis and generalization, the documentary method, pedagogical observation, survey, experiment and methods of mathematical statistics.

**Results and Conclusions.** The differences between the technical and tactical actions of high level fencers were defined. A program to differentiate the technical and tactical training of epee fencers was created. The effectiveness of the program was confirmed by pedagogical experiment.

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## Introduction

The evolution of fencing as a kind of sport, changes in the rules of fencing competitions predetermined the process of fencers competitive activities. In recent years the athletes representing the nations that have been considered uncompetitive until now, begin to provide competition in fencing to traditionally strong countries. Thus, currently, athletes from Korea, China, Egypt, Venezuela, Tunisia, Argentina, Japan and other nations every now and then offer competition to the athletes from Italy, France, Hungary, Ukraine, Germany, the USA and Russia. At the same time the evolution of competitive activities in fencing have given rise to the development of a system of training for competitive activities [Platonov 2004; Czajkowski 2007b; Bradley 2010; Czajkowski, Piwowarski 2010]. Since it has occurred impossible to increase the volume and intensity of practice load for fencers, a problem of finding new ways and provisions has cropped up how to improve various aspects of fencers proficiency.

In the development of fencing several different ways of weapon control have been developed in epee fencing, which involve application of the French or pistol grip. This sort of phenomenon is peculiar to the epee fencing only, and to foil fencing to some extent, whereas it is impossible in saber fencing for the weapon design. The number of epee fencers using the French grip weapon has grown among elite fencers of late. At present the number of epee fencers in the top 16 world ranking who have applied the French hilt during the last 6 years make up 34 % of both males and females [Borysiuk, Cynarski 2005].

Until recently the sports scientists in this country have failed to broach the subject of weapon control in epee fencing at the appropriate level, while fencers training system takes no account of the specificity of weapon control.

Thus, the issue of weapon control has not been highlighted recently. In 2015 Ryzhkova made analysis of the arsenal of technical and tactical actions of women epee fencers taking into account the ways of weapon control. The major characteristics of attacking, counterattacking and defensive actions were determined. The study of the arsenal of technical and tactical actions was carried out to investigate the capacity and effectiveness of the attacking, defensive and counterattacking actions, but unfortunately concerned only female epee fencers.

In recent years, there has been a lot of research which focused on issues of technical and tactical training fencers, mentioned the objective changes in the technical and tactical arsenal of fencers in terms of competitive activity [Smith 2003; Tyshler 1997]. Also, researchers have touched on physical training of fencers [Borysiuk, Cynarski 2005], the pedagogical value of fencing [Czajkowski 2002] theoretical training of fencers [Zadorozhna, Briskin, Pityn 2012, Zadorozhna *et al* 2018], the

history of fencing [Tyshler 1997; Matveev 2001]. Taking into account that the current development, fencing is characterized by the intensification of competitive activities of a fencer, the actual issue of a differentiated approach to improving the technical and tactical training of fencers is emerging.

## The aim of the study

Improvement of technical and tactical training of epee fencers by means of differentiation of the way of weapon control.

## Objectives of the study

1. To determine the structure and content of technical and tactical actions of highly qualified epee fencers using different methods of weapon control.
2. To determine psycho-physiological characteristics of epee fencers taking into account methods of weapons control.
3. To develop and experimentally test the program to differentiate technical and tactical training of epee fencers taking into account methods of weapons control.

## Methods

Theoretical analysis and generalization were used for the analysis of literary sources on the problems of research and identification of the main problems of technical and tactical training in fencing. The documentary method was used for the analysis of official documents of the International Federation of Fencing, the National Federation of Fencing of Ukraine, fencing programs for youth and other documents. Pedagogical observation was used to determine the arsenal of technical and tactical actions of highly qualified epee fencers. The survey (questionnaire) was used to determine the relevance of the problem of differentiation training in epee fencing and to establish criteria for choosing a weapon controlling method. Pedagogical experiment was used to check the effectiveness of the author's program to differentiate the technical and tactical training of epee fencers taking into account methods of weapons control. Methods of mathematical statistics were used to study the results of the research. In particular, the average arithmetic mean square deviation was calculated, a correlation analysis was carried out, Shapiro-Uilk's criterion, Student's t-test, Wilcoxon criterion, Mann-Whitney criterion were determined.

## Organization

During the first stage (October-December 2014), the subject, the purpose of the research, the task, the object and subject of the study were determined, the analysis of scientific and methodological literature for the purpose of research was made. Also a program of pedagogical supervision of competitive activities of highly qualified epee fencers was developed.

At the second stage (January-November, 2015), scientific and methodological literature was analyzed related to research and pedagogical observation of competitive activities of 200 highly qualified epee fencers was carried out. Pedagogical observation was made by using official video of fencing bouts of International fencing federation. 100 bouts of epee fencers who took part in World Cup, World Championships, Olympic Games were analyzed. A questionnaire concerning the choice of a method for the control of weapons in epee fencing was prepared. Questionnaire involved 40 Ukrainian fencing coaches, who have worked in Ukraine for more than 5 years.

The third stage (November 2015 – October 2016) provided for the measurement of indicators of psycho-physiological characteristics of highly qualified epee fencers using a weapon with a French grip. It was 20 highly qualified fencers, and the measurement were held by the complex for psycho and physiological testing "Neurosoft-psychotest". A pedagogical experiment was conducted in which the effectiveness of the author's program to differentiate the technical and tactical training of epee fencers with the account of methods of weapons control was tested. At the beginning and at the end of the pedagogical experiment, indicators of psycho-physiological characteristics of the participants of the experiment and indicators of technical skills were determined, the results of the experiment were worked out.

The fourth stage (November 2016 – September 2017). At this stage the results of the study were summarized.

## Results

In the course of the study, we analyzed competitive activities of 200 highly qualified epee fencers, and determined the scope, efficiency and effectiveness of an arsenal of technical and tactical actions taking into account ways to control weapons. As a result of the analysis of the structure and content of the technical and tactical actions of highly qualified epee fencers, we determined that the arsenal of technical and tactical actions of fencers using different methods of weapon control is different. In this way, attacks with weapon actions are more typical of fencers who use epee with a pistol grip, while simple attacks and tips are more typical of fencers who use epee with a smooth (French) one.

These data allowed us to establish a variety of technical and tactical actions that are most effective in the way of weapon control, and to use them when constructing an experimental program.

Simple attacks prevail by scope and effectiveness in the attacking and tactical actions of qualified epee fencers (6.4; 4.34). The indicators of the attacks with actions on weapon are lower than the indicators of simple attacks. The effectiveness of the attacks with actions on weapon is higher than the effectiveness of simple attacks (55.7% and 51.1% correspondingly). Among the defensive actions of qualified epee fencers defenses are the most numerous (2.4%). Among counterattacking actions the most popular is stop/counter hit, the average amount of which is 4.51. The major action for giving a hit in close combat is remiss.

Correlation analysis of the competitive activities characteristics of epee fencers determined interrelationship of the scope, the hit ratio and effectiveness of the attacking, counterattacking and defensive action of the epee fencers. Growth of the scope and hit ratio characteristics lead accordingly to the increase of the effectiveness of technical and tactical actions, with the exception of simple attacks where the scope does not significantly affect the characteristics of effectiveness of this particular technical action. Simple attacks (0.45;  $p \leq 0.01$ ) and counter hits could be observed mainly in athletes, who apply a French grip to control the weapon (0.54;  $p \leq 0.01$ ). Attacks with the actions aimed at weapon are common to the fencers, who use a pistol grip to control the weapon (0.49;  $p \leq 0.01$ ).

To expand the scientific data on how to accomplish weapon control an interviewing in the form of questionnaire was conducted among the epee fencing coaches. The questionnaire included a number of questions pertaining to individualization of epee fencers training, topicality of the problem of weapon control choice in epee fencing, criteria for choosing the way to control weapon in epee fencing, as well as taking into consideration all the above mentioned issues in the process of technical and tactical training of epee fencers.

Most of the interviewed epee fencing coaches (92%) consider the choice of weapon control to be one of the most significant means of individualization in the epee fencers training. Many coaches (27%) believe that psychological characteristics of fencers are the most essential criteria for choosing the way of weapon control in fencing. Other coaches (22%) apply their own criteria for choosing methods of weapon control, the most popular among which are based on observations of fencers' behavioral peculiarities during competitions and training sessions at the preliminary stages of long-term training. The questionnaire analysis brought up the issue of identification of epee fencers psycho-physiological characteristics.

Hence the next stage of the research was devoted

to the problem of the identification of psycho-physiological characteristics of the epee fencers, who apply the French and pistol grip. A comparative analysis of psycho-physiological characteristics of the epee fencers, who apply different ways of weapon control, was made as well. The experiment was carried out with the help of a special-purpose complex for psycho-physiological testing "Neurosoft-psychotest". The research involved 15 qualified epee fencers, who apply the French grip, and 15 qualified epee fencers, who apply pistol grip (N=30) in weapon control. The following psycho-physiological characteristics were studied: a simple visual-motor reaction, disjunctive reaction, choice reaction, resistance to interference, reaction to a moving object, hand power endurance.

As a result, measurements of psychophysiological characteristics of the epee fencers displayed that the epee fencers, who apply the French grip in weapon control, showed better results in such testing modes as a simple visual-motor reaction, disjunctive reaction, and choice reaction, whereas the results of the epee fencers, who apply the pistol grip in weapon control, according to the similar testing were significantly lower (table 1).

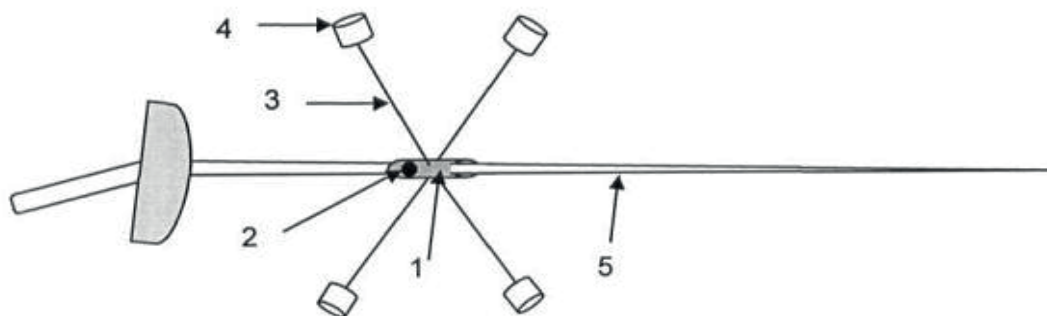
Based on the data obtained as a result of the study of the arsenal of technical and tactical actions of quali-

fied epee fencers, as well as on the psycho-physiological characteristics of the epee fencers, a special author's experimental program to differentiate the epee fencers' technical and tactical training with the account taken of weapon control methods was elaborated. The program contains special training tasks that should be executed during the main part of the training session, whereas the initial and concluding parts of the training session remain unaltered. The program is designed for 4 mesocycles and 4 microcycles, and the intensity of physical loading varies from 50–60% to 90–100% of the individual maximum. The essence if the program consists in the availability of differentiated tasks for the fencers, who apply the French or pistol grip to control the weapon. These tasks were meant for developing ambulation performance, work on a target, work in pairs, training bouts.

During the experiment, we used our patented device for technical training of fencers. The device is designed to improve the technical skills of fencers based on improving the specialized feeling of weapons. The device allows to improve the quantitative and qualitative indicators of technical training and their implementation in terms of competitive activity, reduce time spent on technical performance in fencing action by improving the special feeling of weapons (Figure 1.).

**Table 1.** Indicators of psycho-physiological qualities of highly qualified epee fencers using a gun with a French grip.

№	Indicator	Smooth (French) grip	Pistol grip	p
1	Simple visual-motor reaction	201,8 (± 17,41)	243,5 (±22,6)	<0,01
	errors	2,8	3,2	>0.05
2	Choice reaction	316,2 (± 34,25)	365,1 (±30,6)	<0,01
	errors	5,5	4,08	>0.05
3	Disjunctive reaction	303,9 (± 41,63)	338,3 (±29,1)	<0,05
	errors	4,5	4,8	>0.05
4	Resistance to interference	285,1 (± 20,88)	295,4 (±19)	>0.05
	forwarded	2,2	3,5	>0.05
	delays	0,2	0,2	>0.05
5	Reaction to a moving object	45,4 (± 25,2)	1,5 (±9,3)	>0.05
	exact reactions	40%	38%	>0.05
	forwarded	40%	38%	>0.05
	delays	20%	23%	>0.05
6	Power endurance of the brush	88% (±4%)	85%	>0.05



**Figure 1.** Device for technical training fencers. 1. – Metal cylinder; 2. – The hole for the blade; 3. – Tube of weighting compound; 4. – Weighting compound; 5. – The blade.

We used this device to improve weapon control of epee fencers when they were training in pairs and training on a fencing target. The device was used during the whole experiment.

An educational experiment has been carried out in order to test the experimental program to differentiate of the epee fencers' technical and tactical training with the account taken of the ways of weapon control. The experiment involved 45 epee fencers, divided into 3 groups,

two of which were experimental and the third group was a comparison one. No. 1 experimental group included epee fencers, who held the weapon with French handle, whereas No. 2 experimental group included epee fencers, who held the weapon with a pistol grip. No. 3 comparison group involved other fencers, whose method of weapon handling was not taken into account. During the experiment training sessions in the experimental groups were conducted according to the author's program to differen-

**Table 2.** Comparison of indicators of psycho-physiological characteristics and technical skills at the beginning and at the end of the pedagogical experiment in experimental group No. 1.

Nº	Indicators	Before experiment	After experiment	Growth	p
1	<b>Simple visual-motor reaction</b>	242.8 ±28,2	242.8 ±37	0	>0.05
	errors	2,53	1,6	0,93	>0.05
2	<b>Reaction of choice</b>	363,0 ±30,1	356,1 ±30,8	6,9	>0.05
	<b>Number of errors:</b>	1,7	1,6	0,1	>0.05
	-in the main color				
	-In secondary color	2,3	2,0	0,3	>0.05
3	<b>Disjunctive reaction</b>	328,4 ±27,6	339,1 ±21,7	-10,7	>0.05
	errors	4,6	3,0	1,6	>0.05
4	<b>Resistance to interference</b>	282,0 ±77,9	299,4 ±18,0	-17,0	>0.05
	forwarded	2,4	2,9	-0,5	>0.05
	delays	0,13	0,5	-0,37	>0.05
5	<b>Reaction to a moving object</b>	2,69 ±10,8	-4,7 ±13,1	7,39	>0.05
	exact reactions	34%	49%	15%	<0.05
	forwarded	42%	38%	4%	>0.05
	delays	24%	13%	11%	>0.05
6	<b>Power endurance of the brush</b>	81%	90%	9%	<0.01
7	<b>Accuracy of simple attacks</b>	7,1 ±0,6	8,9 ±0,8	1,8	<0.01
8	<b>Accuracy of simple attacks with avoidance</b>	6,7 ± 0,6	8,8 ±0,8	2,1	<0.01
9	<b>Accuracy of attacks with weapon actions</b>	7,3 ± 0,6	8,3 ±0,9	1	<0.01

**Table 3.** Comparison of indicators of psycho-physiological characteristics and technical skills at the beginning and at the end of the pedagogical experiment in experimental group No. 2.

Nº	Indicators	Before experiment	After experiment	Growth	p
1	<b>Simple visual-motor reaction</b>	229,9 ± 22,6	227,7±24,7	2,2	>0.05
	errors	2,9	1,3	1,6	>0.05
2	<b>Reaction of choice</b>	383,0 ±43,1	348,5 ±25,2	34,5	>0.05
	<b>Number of errors:</b>	6,53	1,6	4,93	>0.05
	-in the main color				
	-In secondary color	2	1,6	0,4	>0.05
3	<b>Disjunctive reaction</b>	335,8 ±33,8	322,6 ±28,5	13,2	>0.05
	errors	5,6	3,4	2,2	<0.01
4	<b>Resistance to interference</b>	296,2 ±23,0	295,9 ±31,3	0,3	>0.05
	forwarded	5,6	2,0	3,6	<0.01
	delays	0,2	0,2	0	<0.01
5	<b>Reaction to a moving object</b>	-4,7 ±6,12	-4,4 ±6,0	0,3	>0.05
	exact reactions	56%	73%	17%	<0.01
	forwarded	27%	20%	7%	>0.05
	delays	14%	7%	7%	>0.05
6	<b>Power endurance of the brush</b>	85% ±6%	89% ±1,3%	4%	<0.05
7	<b>Accuracy of simple attacks</b>	7,3 ±1,0	8,8 ±0,7	1,5	<0.01
8	<b>Accuracy of simple attacks with avoidance</b>	6,5 ±1,0	8,8 ±0,8	2,3	<0.01
9	<b>Accuracy of attacks with weapon actions</b>	6,9 ±0,8	8,6 ±0,7	1,7	<0.01

**Table 4.** Comparison of indicators of psycho-physiological characteristics and technical training at the beginning and at the end of the pedagogical experiment in the control group.

Nº	Indicators	Before experiment	After experiment	Growth	p
1	<b>Simple visual-motor reaction errors</b>	251,5 ± 19,9	217,3 ± 28,7	34,2	<0.01
		2,1	2	0,1	>0.05
2	<b>Reaction of choice</b>	366,7 ± 27,1	361,6 ± 26,7	5,1	>0.05
	<b>Number of errors:</b>	1,9	2,8	-0,9	>0.05
	<b>-in the main color</b>				
	<b>-In secondary color</b>	1,5	2,4	-0,9	>0.05
3	<b>Disjunctive reaction errors</b>	346,5 ± 25,8	315,2 ± 23,0	31,3	<0.01
		3,5	3,0	0,5	<0.01
4	<b>Resistance to interference forwarded delays</b>	306,5 ± 13,4	287,9 ± 12,2	18,6	<0.01
		1,7	2,7	-1	<0.01
		0,5	0,4	0,1	<0.01
5	<b>Reaction to a moving object exact reactions forwarded delays</b>	0,5 ± 9,8	-8,89 ± 9,3	9,39	>0.05
		32%	52%	20%	>0.05
		45%	39%	6%	>0.05
		23%	9%	14%	>0.05
6	<b>Power endurance of the brush</b>	81%	85%	5%	<0.05
7	<b>Accuracy of simple attacks</b>	7,1 ± 0,9	8,0 ± 0,92	0,9	<0.01
8	<b>Accuracy of simple attacks with avoidance</b>	6,7 ± 0,8	7,9 ± 0,96	1,2	<0.05
9	<b>Accuracy of attacks with weapon actions</b>	7,0 ± 0,8	7,5 ± 0,91	0,5	<0.05

tiate the epee fencers' technical and tactical training with the account taken of the ways of weapon control, whereas the comparison group trained according to a generally accepted fencing program for children and youth sports schools. To test the effectiveness of the author's experimental program the measurements of psycho-physiological characteristics of the epee fencers alongside with their technical and tactical efficiency were accomplished. The special-purpose complex for psycho-physiological testing "Neurosoft-psychotest" was used for measurement of psycho-physiological characteristics, and to measure the level of technical and tactical efficiency a special "device for technical and tactical training of fencers" was used. The measurement was carried out at the beginning and at the end of the educational experiment.

At the beginning of the educational experiment no significant differences were observed in the indices of psycho-physiological characteristics of fencers, as well as in the indices of technical skills of the epee fencers, who belonged to both experimental and a comparison group.

So in the first experimental group there was a significant increase in the indicators of technical skills: the precision of the simple attacks, as well as the accuracy of attacks with weapon actions and avoidance attacks.

These data indicate improvements in the technical skills of epee fencers using an epee with a French grip, for weapon control. Also, as a result of the research, it was found that the increase in precision points of the simple attacks with the avoidance is significantly higher than the increase in the accuracy of attacks with weapon actions, which is typical of epee fencers with a French grip.

It should also be noted increase in the index of strength endurance of the brush. What, in our opinion,

is the effective control of the weapon in epee fencing, and is the basis for raising the indicators of, in particular, the technical skills of fencers.

In the second experimental group, which included epee fencers who use a pistol grip, there was an increase in the indicators of technical skills, but the accuracy of the attacks with weapon actions, is higher than the increase of other indicators of technical skills.

We see that such results of the indicators of experimental groups 1 and 2 are the result of our program implementation, in which the differentiation of training tasks for epee fencers was carried out, depending on the way of weapon control. Also, in this group, the index of strength of the hand was significantly increased, which in our opinion provides an increase in the indicators of technical skills and is important for the control of weapons.

In the control group, which was engaged in the usual fencing program for the Youth School also, there was a significant increase in the indicators of technical skills and strength of the brush, but the increase of the indicators was somewhat lower.

Thus, we can state the positive impact of the author's program to differentiate technical and tactical training of epee fencers, taking into account ways of weapons control.

## Discussion

In the development of epee fencing several different ways of weapon control have been developed, which involve the use of a French or pistol grip. Such a phenomenon is characteristic only for epee fencing, and to a lesser extent

for foil fencing, and fencing in saber is impossible, due to the construction of weapons.

At the same time, the issue of weapon control in recent years has not been sufficiently highlighted. In 2015, L. Ryzhkova carried out an analysis of the arsenal of technical and tactical actions of women epee fencers, taking into account methods of weapon control. The main indicators of the attack, counterattack and protective tactical actions were determined. The study of a variety of technical and tactical actions was aimed at determining the scope and effectiveness of attack, defensive and counteracting actions, but only for women epee fencers.

Also we have conducted a pedagogical observation of the competitive activities of the highly qualified epee fencers. Unlike the observation of L. Ryzhkova, our observation was directed at the adventurous activity of epee fencers, which were among the 64 best at the stages of the World Cup, the World Championships, the Olympic Games. The purpose of our observation was to determine the arsenal of technical and tactical actions of highly qualified epee fencers. To achieve the goal of our observation, we have selected indicators of attack, defense and counterattack, but the number of indicators was greater than that of our predecessors. In particular, indicators of simple attacks, attacks with weapon actions, defenses, simple hits, and counterattacks were recorded.

Based on the data obtained as a result of the study of the arsenal of technical and tactical actions of highly qualified epee fencers, and the psycho-physiological characteristics of epee fencers, we developed an author's experimental program to differentiate the technical and tactical training of epee fencers on the basis of weapons control techniques.

Exemplary program differs from the generally accepted program for the youth sport schools and the experimental studies of Khokhla, Semeryak, Ryzhkova, Zadorozhna. The main differences are in the use of special exercises for various weapon control techniques.

Exercises for epee fencers who uses epee with a French grip are based on data from an arsenal of technical and tactical actions by highly qualified epee fencers using an epee with a French grip. The focus is on simple attack and counterattacking. In this case, other exercises are also present among the training exercises, however, more attention is paid to the actions that are typical for fencer using a weapon with a French grip.

For epee fencers using a pistol (Belgian, English etc.) grip, special exercises have been developed that improve the technical and tactical actions that are typical of fencers who use this method of weapon control. At the same time, other exercises are also present in the program, with the aim of improving technical and tactical skills as a whole, and the emphasis is on the specific, for this purpose, method of weapon control.

Thus epee fencers using different methods of weapon control in general increase the level of technical

and tactical skills, and differentiated exercises contribute to the further improvement of those technical and tactical actions that are typical of a certain method of weapon control.

## Conclusions

In the structure of attacking technical and tactical actions of highly skilled fencers, by volume and efficiency, simple attacks predominate (6.4 and 4.3 attacks, respectively). Indicators of attacks with weapon actions are lower than those of simple attacks. The effectiveness of attacks with weapon actions is higher than the effectiveness of simple attacks (53.1% and 67.4% respectively). Among attacks with weapon actions of highly skilled fencers, the greatest number of defenders are defense with response actions (2.5 actions). Among counterattacking actions, the largest amount has simple hits, the average amount of which is 4.51.

As a result of the study of the psycho-physiological characteristics of epee fencers using a weapon with a French grip and weapons with a pistol grip and their comparison, we have determined that the indices of simple visual-motor reaction, the reaction of choice and the distinction reaction in epee fencers using weapons with a French grip is significantly higher than that of fencers using epee with a pistol grip.

Among the indicators of psycho-physiological characteristics of epee fencers, the highest growth at the end of the experiment is observed in the indicator of strength endurance of the brush in the experimental group number 1 and is 9% at  $p < 0.01$ . Among the indicators of technical and tactical skills after the experiment there is a significant increase of all indicators in all groups, which is the result of training, but in experimental groups, the growth of these indicators is higher, which confirms the effectiveness of the author's program to differentiate the technical and tactical training of epee fencers taking into account ways of weapon control.

In the experimental group 1, the results of the test for the accuracy of the hits in performing simple attacks and attacks with avoidance are significantly higher than in experimental group 2 ( $p < 0.01$ ), and the control group, along with the results of the test for the accuracy of hits in the course of attacks with weapon actions is significantly higher in experimental group number 2 ( $p < 0,01$ ). Such data testify to the effective differentiation of training of epee fencers taking into account ways of weapons control.

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## References

1. Boostani M.A., Boostani M.H., Nowzari V. (2012), *Investigation and comparison of aggression in athletes in non-contact (swimming), limited contact (karate) and contact (kickboxing) sports*, "Ido Movement for Culture. Journal of Martial Arts Anthropology", vol. 12, no. 3, pp. 1-4.
2. Borysiuk Z., Cynarski W.J. (2005), *Reaction time and movement time, types of sensorimotor responses and fencing tempo*, "Ido Movement for Culture. Journal of Martial Arts Anthropology", vol. 9, pp. 189-200.
3. Borysiuk Z., Pakosz P. (2011), *Motor model of fencing lunge of Sylwia Gruchala – Olympic vice-champion in foil*, "Ido Movement for Culture. Journal of Martial Arts Anthropology", vol. 11, no. 4, pp. 12-15.
4. Bradley S. (2010), *The Pineal Gland's Biochemical Function in the Fighting and Meditative Arts: Exemplified in Korean Sinmoo Hapkido*, "Journal of Asian Martial Arts", vol. 19, no. 2, pp. 22-33.
5. Briskin Y., Pityn M., Zadorozhna O. (2013), *Model of game mean "An algorithmic mean of theoretical training in sports": certificate of restoration by the author. Rights to work № 48823 Ukraine. – 18.04.13.*
6. Briskin Y., Pityn M., Zadorozhna O. (2014), *Simulator «TTT»: certificate. 87250 Ukraine, № u201311394. – 27.01.2014.*
7. Briskin Y., Pityn M., Zadorozhna O., Smyrnovskyy S. (2014), *Technical devices of improvement the technical, tactical and theoretical training of fencers*, "Journal of Physical Education and Sport", vol. 3, no. 51. – pp. 337-341 [in English].
8. Czajkowski W., Piwowarski J. (2010), *Administrowanie jakoscia zycia czlowieka poprzez system Modern Bushido*, "Ido Movement for Culture. Journal of Martial Arts Anthropology", vol. 10, no. 1, pp. 17-23 [in Polish].
9. Czajkowski Z. (2002), *Leadership styles and abilities of coaches*, "Ido Movement for Culture. Journal of Martial Arts Anthropology", vol. 3, pp. 190-203 [in Polish].
10. Czajkowski Z. (2007b), *How to be a successful coach?*, "Ido Movement for Culture. Journal of Martial Arts Anthropology", vol. 7, pp. 174-181.
11. Johnson J. (2016), *Enhancing Taekwondo Pedagogy through Multiple Intelligence Theory*, "Ido Movement for Culture. Journal of Martial Arts Anthropology", vol. 16, no. 3, pp. 57-64, doi: 10.14589/ido.16.3.7.
12. Johnson J. (2017), *From technique to way: an investigation into taekwondo's pedagogical process*, "Ido Movement for Culture. Journal of Martial Arts Anthropology", vol. 17, no. 4, pp. 3-13.
13. Johnson J., Hyo Jung Kang (2018), *Hapkido research trends: a review*, "Ido Movement for Culture. Journal of Martial Arts Anthropology", vol. 18, no. 3, pp. 42-50, doi: 10.14589/ido.18.3.7.
14. Matveev L. (2001), *The general theory of sport and its applications*, pp. 310-334[in Russian].
15. Ostianov V.N., Haidamak I.I. (2001), *Boxing (learning and training)*, *Olympic literature*, 237 p. [in Russian].
16. Petukhov V. (1969), *Registration of boxers' motoric by special tools*, "Theory and practice of physical culture". № 2, pp. 43-45 [in Russian].
17. Pityn M. (2013), *Features of theoretical training in combative sports*, "Journal of Physical Education and Sport", vol. 13 (2), no. 32, pp. 195-198 [in English].
18. Pityn M., Briskin Y., Perederiy A., Galan Y., Tsyhykalo O., Popova I. (2017), *Sport specialists attitude to structure and contents of theoretical preparation in sport*, "Journal of Physical Education and Sport", Pitesti, Art. 17, pp. 988-994 [in English].
19. Platonov V. (2004), *System of training athletes in Olympic sports. General theory and its practical applications: studies. coach of the highest. qualification*, pp. 220-250 [in Russian].
20. Smith J.J. (2003) *The techniques and tactics of modern foil fencing*. Summers dale Publishers, Chichester, pp. 120-174.
21. Smyrnovskyy S. (2014), *The structure and content of the technical and tactical actions of highly qualified epee fencers*. *Sport ta suchasne suspilstvo*, pp.160-165 [in Ukrainian].
22. Tyshler D. (1997), *Fencing*, pp. 258-311 [in Russian].
23. Zadorozhna O., Briskin Yu., Perederiy A., Pityn P., Sydorko O. (2018), *Team composition in epee fencing which accounts for sportsmen's individual performance*. *Journal of Physical Education and Sport*. Pitesti, Art 273 pp. 1863-1870; doi: 10.7752/jpes.2018.s4273.

### Zróznicowanie szkolenia technicznego i taktycznego szermierzy z uwzględnieniem kontroli broni

**Słowa kluczowe:** szermierka, zróznicowanie, metody kontroli broni, szkolenie techniczne i taktyczne

#### Streszczenie:

Tło. Ewolucja rywalizacji w dziedzinie szermierki dała początek rozwojowi systemu szkoleń w zakresie działań opartych na rywalizacji. Ponieważ okazało się niemożliwe zwiększenie ilości i intensywności obciążenia treningowego dla szermierzy, pojawił się problem znalezienia nowych sposobów i przepisów mających na celu poprawę różnych aspektów biegłości szermierzy. W ramach rozwoju szermierki opracowano kilka różnych sposobów kontroli broni w szermierce z użyciem szpady, które obejmują zastosowanie tzw. chwytu francuskiego lub pistoletowego. Obecnie liczba szablistów znajdujących się w pierwszej szesnastce rankingu światowego, którzy w ciągu ostatnich sześciu lat stosowali chwyt francuski, stanowi 34 % zarówno mężczyzn, jak i kobiet.

Problem i cel. Do niedawna badacze sportu na Ukrainie nie poświęcili zbyt wiele uwagi tematowi kontroli użycia szabli, podczas gdy systemy szkolenia szermierzy nie uwzględniają specyfiki kontroli broni. Celem niniejszej pracy jest poprawa



treningu technicznego i taktycznego szermierzy poprzez zróżnicowanie kontroli broni.

Metody. Zastosowano następujące metody: analizę teoretyczną i uogólnienie, metodę dokumentalną, obserwację pedagogiczną, ankietę, eksperyment i metody statystyki matematycznej.

Wyniki i wnioski. Określono różnice między działaniami technicznymi i taktycznymi szermierzy na wysokim poziomie zaawansowania. Stworzono program różnicowania treningu technicznego i taktycznego szablistów. Skuteczność programu potwierdzono eksperymentem pedagogicznym.

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