UDK 796.01/03+612.8+159.944/947

ISSN (English ed. Online) 2311-6374

2020. Vol. 8. No. 6, pp. 59-70

EVALUATION EMOTIONAL AND VOLITIONAL IN DEVELOPING TRAINING COMPLEX FOR A UNIVERSAL MODEL ATHLETES FROM MILITARY AVIATION PENTATHLON (VAP)

Andriy Poltavets[1]

Andriy Yefremenko[2]

Viacheslav Mulyk[3]

Andriy Kiyko[3]

Ivan Kozhedub Kharkiv National University of the Air Force[1],
Kharkiv, Ukraine
German Pentathlon Federation of Germany[2],
Darmstadt, Germany
Kharkiv State Academy of Physical Culture[3],
Kharkiv, Ukraine

Purpose: to analyze the initial indicators characterizing the type of temperament and lability of the nervous system in first-year cadets of a higher educational institution who are applicants for the national team in international military - aviation pentathlon.

Material and methods: analysis of literature sources, testing, statistical analysis. The study involved 48 first-year cadets of the Kharkiv National University of the Air Force named after Ivan Kozhedub (men) aged 17-18, of whom 38 candidates for Master of Sports and 10 Masters of Sports.

Results: taking into account the initial data on the distribution of male cadets of the first year of the KhNUPS by sport, the type of temperament and certain data on

the lability of the nervous system in the first year cadets of a higher educational institution were determined, they are applicants for the national team in the international military aviation pentathlon. The analysis of the data obtained was carried out in the form of a verbal description, tables, an analytical description of the obtained patterns.

Conclusions: it was determined that the initial indicators of the type of temperament, the level of self-assessment of willpower and the properties of the nervous system of cadets-applicants for the combined team in military aviation pentathlon are non-uniform. In competitions in military aviation pentathlon, the decisive day is the 5th day of the competition - overcoming the obstacle course and orienteering. Since all team members must solve the same, identical task against the background of different initial data on the lability of the nervous system and the type of temperament, this fact motivates the search for a training method that would support the achievements already acquired and develop those who need it equal proportion in all subjects. This method can be a crossfit method based on the philosophy of versatile physical development and meets the goal of developing a training complex for training athletes according.

Keywords: military aviation pentathlon, temperament, properties of the nervous system, lability of the nervous system, circuit training, crossfit.

Introduction

It is known that one of the most difficult complex competencies that an athlete with VAP should have is a competitive day of passing the obstacle course together with orienteering.

During the passage of the obstacle course, the athlete's body experiences functional stress, which in most cases in the absence of special prior training can lead to increased lability of the nervous system, especially the emotional-volitional sphere [1,2].

Orienteering is one of the most specific sports, which combines high physical and mental stress on the background of great volitional and emotional stress, aimed at solving a number of practical problems [3,4].

As the process of training and competition puts before athletes the need to overcome extremely difficult, and in some cases, extreme psycho-emotional and physical stress, especially in the competitive period, and given the fact that when recruiting to the national team with VAP, cadet applicants are 17- 18 years and formed a psychotype of personality, thinking, feeling and perception and have already achieved high results in sports, but in its various forms (game, cyclic, complex-coordination, martial arts), for the formation of a set of training exercises, techniques, methods of research they have typological features of temperament, properties of the nervous system.

Given the above, it is important to develop in athletes during training tolerance to emotional stress, which occurs against the background of functional stress during competitions with VAP.

Therefore, **the aim of the study** was to analyze the baseline indicators that characterize the type of temperament and lability of the nervous system in cadets-applicants for the national team with VAP.

Material and methods

The study involved 48 first-year cadets of the Ivan Kozhedub Kharkiv National University of the Air Force (men), aged 17-18, including 38 candidates for masters of sports and 10 masters of sports in various sports. All candidates for further training in military aviation pentathlon were divided into four groups by sport, namely: game (group I - 12 cadets), cyclic (group II - 14 cadets), complex coordination (group III - 10 cadets), martial arts (group IV - 12 cadets). The cadets who participated in the study were randomized by age, anthropometric, and general health.

To implement randomization, each of the groups was compared according to the indicators of temperament type according to G. Eisenko [5,6] and self-assessment of willpower, which is determined by the test of MM Obozova [7,8].

The evaluation of the properties of the nervous system was carried out using a tapping test according to E.P. Ilyin [9,10]. The advantage of the technique of tapping test EP Ilyina is that in psychomotor activity she reflects first of all the shifts in the nervous system of the subject, and not in his muscles. That is, these are different mechanisms of fatigue, different types of fatigue. Therefore, we can not draw conclusions about the strength of the nervous system for human endurance in work of moderate or high intensity. Based on qualitative criteria, which are the main, E.P. Ilyin divides all subjects into groups with strong, medium, medium-weak and weak nervous system, these are the characteristics we used in the assessment of cadets. Therefore, to assess the state of indicators of higher nervous activity at the stage of formation of the national team with VAP among first-year cadets of Kharkiv National University of the Air Force named after Ivan Kozhedub, we determined the above indicators at the time of screening.

Methods of parametric statistics were used to process the obtained data (Glanz S., 1999). Statistical processing of data entered in Excel spreadsheets was performed. Quantitative characteristics of the main functional indicators were processed statistically, namely, determined the arithmetic mean, the error of the mean. The significance of the obtained data was checked using Student's t-test (for $n < 100$) at a given level of reliability $p = 0.95$. To be able to use the Student's t test, the Fischer-Snedekor test was calculated - the ratio of the larger variance to the smaller one. All mathematical operations and graphical constructions were performed using the software packages "Microsoft Office XP": "Microsoft XP Home" and "Microsoft Excel XP" on a personal computer (license numbers: 00049 153 409 442 and 74017 640 0000106 57664, respectively).

Results of the research

In determining the type of temperament, which is an important indicator when participating in competitions with VAP, when you want to minimize the impact of subjective characteristics of cadets, the results were obtained, which are presented in table 1

Table 1

The predominant type of temperament in the first-year cadets of KhNUPS (men) of candidates for the national team with VAP on the test of G. Eisenko, %

Temperament type	Groups			
	I (n=12) – game sports	II (n=14) – cyclic sports	III (n=10) – hard-coordination sports	IV (n=12) – combat sports
Choleric	6 (50%)	3 (22%)	3 (30%)	3 (25%)
Sanguine	3 (25%)	2 (14%)	4 (40%)	7 (59%)
Phlegmatic	3 (25%)	9 (64%)	3 (30%)	2 (16%)
Melancholic	0	0	0	0

Groups:
Group I - game sports; Group II - cyclic sports;
Group III - hard-coordination sports; Group IV - combat sports.

When analyzing the data in table 1, it was determined that choleric extroverts with a strong but unbalanced type of nervous system, which characterized them as an unstable excitable, unrestrained, aggressive, impulsive, optimistic, active personality with unstable performance and mood and predisposition hysterical-psychopathic reactions in group I (game sports) among cadets-applicants to the national team with VAP was 50%, in group II (cyclic sports) - 22%, in group III (complex coordination sports) - 30% , in group IV (martial arts) - 25% of athletes.

In turn, sanguine extroverts with a strong, balanced, mobile type of nervous system, which characterized them as a stable, social, outward-looking, sociable personality with stubbornness to achieve the goal in group I were 25%, in group II - 14% , in group III - 40%, in group IV - 59% of athletes.

Phlegmatic introverts with a strong, balanced, but inert type of nervous system, which characterized them as stable, slow, calm, passive, unmoved, careful, thoughtful, restrained, reliable, calm in relationships, able to withstand prolonged trouble without disruption of health mood in group I were 25%, in group II - 64%, in group III - 30%, in group IV - 16% of cadets. At the same time, the temperament that would correspond to the characteristics of melancholic introverts with a weak nervous system was not determined among the subjects.

Thus, it can be noted that, despite the predominance of one or another type of temperament in each of the groups, which undoubtedly had an interaction with a sport in which cadets had significant at the time of the study sports achievements (CMS, MS), in general in each from the categories of sports activities were cadets with different types of nervous system, which had already formed at the time of admission to the university and characterized their individual personality.

It should be noted that, taking into account the fundamental differences of each competition day with VAP, each of the athletes had an advantage in a particular sports competition, which helped balance the total number of points at the time of the last day - overcoming obstacles and orienteering. Given that it is not possible to influence the type of temperament and functional state of the nervous system of a cadet in preparation for the competition due to age, previous experience and personality, it is important to develop and implement in the training complex methods that would develop qualities that can to receive at physical and mental loading.

In determining the level of self-assessment of willpower on the test MM Obozova (Table 2) it was determined that none of the cadets who took part in the study had a weak willpower, which is logical given that each of them has high sports achievements at the time of the study.

The level of self-assessment of willpower (subjective criterion, but informational important for the construction of the training process), which was defined as average, in group I was determined in 50% of cadets, 15,1±0,9 points, in group II - in 36%, 18,2±1,1 points, in group III - in 30%, 19,4±0,8, in group IV - in 42% of athletes, 19,2±1,1 points. At the same time, its lowest values were in the subjects who had achievements in playing sports, which was probably ($p<0,05$) less than the number of points in groups II, III and IV, which probably depended on the reduction of responsibility at the personal level when participating in team (game) competitions. In groups II, III and IV, the number of points that characterized the level of self-assessment of willpower was almost different and corresponded to the upper limit of the range of values.

Table 2

Indicator of the level of self-assessment of willpower in cadets of the first year of KhNUPS (men) of applicants to the national team with VAP on the test of MM Obozova, + m, points

The level of self-assessment of willpower	Groups			
	I (n=12)	II (n=14)	III (n=10)	IV (n=12)
from 0 to 12 points - weak willpower	0	0	0	0
from 13 to 21 points - average willpower	6 (50%) 15,1±0,9	5 (36%) 18,2±1,1	3 (30%) 19,4±0,8	5 (42%) 19,2±1,1
willpower is average, points	**$t_{1,2}$=2,70 ($p_{2,4}$<0,05); $t_{1,3}$=3,22 ($p_{1,3}$<0,05); $t_{1,4}$=2,21 ($p_{1,4}$<0,05);** $t_{2,3}$=1,34 ($p_{2,3}$>0,05); $t_{2,4}$=1,41 ($p_{2,4}$>0,05); $t_{3,4}$=0,59 ($p_{3,4}$>0,05)			
from 22 to 30 points - great willpower	6 (50%) 24,6±0,7	9 (64%) 25,1±1,2	7 (70%) 27,2±1,4	7 (58%) 24,9±1,2
willpower is great, points	$t_{1,2}$=1,55 ($p_{1,2}$>0,05); **$t_{1,3}$=2,48 ($p_{1,3}$<0,05);** $t_{1,4}$=1,60 ($p_{1,4}$>0,05); $t_{2,3}$=1,37 ($p_{2,3}$>0,05); $t_{2,4}$=1,47 ($p_{2,4}$>0,05); $t_{3,4}$=0,54 ($p_{3,4}$>0,05)			

Groups:
Group I - game sports; Group II - cyclic sports;
Group III - hard-coordination sports; Group IV - combat sports.

The level of self-assessment of willpower, which was defined as high (high willpower), in group I was determined in 50% of cadets, 24,6±0,7 points, in group II - in 64%, 25,1±1,2 points , in group III - in 70%, 27,2±1,44; in group IV - in 58% of athletes, 24,9±1,2 points. At the same time, its lowest values were in the subjects who had achievements in playing sports, which was probably ($p<0,05$) less than the number of points in group III. The highest number of points was determined by this indicator for cadets who were engaged in complex coordination sports and had high sports achievements.

Another important indicator is the homogeneity of the level of self-assessment of willpower in each of the groups. Thus, this indicator was the least homogeneous in groups I and III, but in group I 50% of cadets had the lowest values of the level of self-assessment of willpower among the entire cohort of subjects. On the contrary, in group III 70% of athletes with the highest values among all studied cadets had a high

score. In groups II and III, this figure was the most homogeneous, but the vast majority of athletes had a high level of self-esteem, 64% and 58%, respectively.

When determining the properties of the nervous system using a tapping test by E.P. Ilyin (Table 3), counted the number of points in each square, and then built a diagram of performance for each cadet separately by plotting on the abscissa 5-second time intervals, and on the ordinate - the number of points in each square. An important point in the interpretation of the data was the understanding that the strength of nervous processes is an indicator of the efficiency of nerve cells and the nervous system as a whole. A strong nervous system can withstand a greater magnitude and duration of load than a weak one.

Table 3

The indicator of the properties of the nervous system in the first-year cadets of KhNUPS (men) of applicants to the national team with VAP with the help of a tapping test according to EP Ilyin, %

Type of nervous system	Groups			
	I (n=12)	II (n=14)	III (n=10)	IV (n=12)
Convex type of curve, strong nervous system	4 (33%)	7 (50%)	6 (60%)	4 (33%)
Smooth curve type, nervous system of medium strength	4 (33%)	4 (30%)	3 (30%)	4 (33%)
Descending type of curve, weak nervous system	4 (33%)	0	0	4 (33%)
Intermediate type of curve, medium-weak nervous system	0	3 (20%)	1 (1%)	0
Concave type of curve, medium-weak nervous system	0	0	0	0

Groups:
Group I - game sports; Group II - cyclic sports;
Group III - hard-coordination sports; Group IV - combat sports.

Our data on the properties of the nervous system in all subjects determined the heterogeneity, the percentage of which coincided in each of the groups, despite the presence of sports results for one activity. Thus, in group I, the convex type of curve, which characterizes a strong nervous system, was determined in 33% of cadets, equal type - nervous system of medium strength - in 33%, and descending type - weak nervous system - also in 33% of athletes. In group II, the convex type of the curve

diagram, its equal type were obtained in 50% and 30% of cadets, respectively, while none of them received an ascending type of curve, and in the last 20% determined its intermediate type, which corresponded to medium-weak nervous system.

In group III, convex, smooth and intermediate curve types were obtained by constructing individual diagrams of 60%, 30% and 10%, respectively. In group IV, the ratio of the type of nervous system among athletes coincided with the results obtained during the analysis of data in group I and was 33%, 33% and 33% convex, smooth and descending type of curve, respectively.

Given the data obtained, it can be noted that the initial indicators of the type of temperament of cadets-applicants for the national team with VAP, the level of self-assessment of willpower and properties of the nervous system are heterogeneous. Given that the first 4 days of the sports competition with VAP are devoted to different ideologies of competitions - air pistol shooting, swimming, fencing and basketball - the presence of heterogeneity of indicators on the tests contributes, on the contrary, the homogeneity of team scores, which are defined as average for all participats. At the same time, the decisive, 5th day of the competition is important - overcoming the obstacle course and orienteering, as all team members must solve the same, identical task against the background of different initial data. This motivates the search for a training method that would support the already acquired achievements and develop those who need it, in equal proportions in all subjects. Thus, the method of crossfit, which is based on the philosophy of multifaceted physical development, is the most that meets the goal of developing a training complex for athletes with VAP.

Conclusions / Discussion

Introduction of tests to determine the type of temperament, level of self-assessment of willpower and nervous system strength during the selection process of athletes in the national team in international military aviation pentathlon is an important point in determining the appropriate algorithm for further training.

When determining the properties of the nervous system using a tapping test by E.P. Ilyin, and the interpretation of the data was an important point in understanding

that the strength of nervous processes is an indicator of the efficiency of nerve cells and the nervous system as a whole. A strong nervous system can withstand a larger magnitude and duration of load than a weak one

When analyzing the data obtained when determining the type of nervous system in each of the athletes, we entered in the table the number of subjects in which the diagrams determined a particular type of nervous system. Given that all cadets at the time of randomization had significant sporting achievements (CMS, MS), the purpose of determining the properties of the nervous system by tapping test was to understand the initial data on the form of balancing the body of athletes with the environment. Since the success of mastering and realizing sports ambitions depends on whether the activity or its style corresponds to the initial psychophysical status, obtaining different, heterogeneous results is a motivation to find optimal psychophysical ways to build a training process aimed at success in one activity (sports competition with VAP). cadets with different typological features

When comparing the data obtained in determining the temperament of the subjects, the type of lability of their nervous system, as well as the level of self-assessment of willpower, it should be noted that the indicators are heterogeneous. Those or other features of each of the athletes add a single whole to the number of points for the first 4 competitive days, as each component of the sports competition with VAP provides for participants to pass stages with different differentiated sports tasks. Thus, it is important to train performance, endurance, motor-coordination skills and cognitive abilities, which would help to collect the maximum number of points on the last day of the competition while overcoming the obstacle course and performing the task of orienteering.

Long-term practice of one or another (game, cyclic, complex-coordination, martial arts) sport on the eve of the status of a candidate for membership in the national team with VAP makes it necessary to develop a universal set of exercises that do not require special equipment is understandable, and meets the requirements that for a certain number of repetitions of different exercises, the skill can be formed by accelerating their performance and increasing their number depending on the

phase of the training process with reaching the peak of opportunities immediately before the competition.

Conflict of interest. The authors state that there is no conflict of interest that could be perceived as detrimental to the impartiality of the article.

Sources of funding. This article has not received financial support from a government, community, or commercial organization.

References

1. Kirpenko, V. M., Zolochevskii, V. V. and Poltavets, A. I. (2020), Podolannya pereshkod. Smuga pereshkod CISM [Overcoming obstacles. CISM obstacle course], KhNUPS im.I.Kozheduba, Kharkiv, 104 p. (in Ukr)
2. Kirpenko, V. M., Piddubnii, O. G. and Poltavets, A. I. (2016), Aeronavtichne bagatoborstvo [Aeronautical all-around], KhNUPS im.I.Kozheduba, Kharkiv, 168 p. (in Ukr)
3. Shcherbakov, M. A, Lyannoy, M. O. (2015), Fundamentals of sports orientation [Basics of orienteering]: educational and methodical recommendations, Sumy: Publishing house of Sumy State Pedagogical University named after AS Makarenko, 32 p. (in Ukr).
4. Landa, B.Kh. (2011), Metodika kompleksnoi otsenki fizicheskogo razvitiya i fizicheskoi podgotovlennosti [Methodology for a comprehensive assessment of physical development and physical fitness], Moskva: Sovetskii sport, 348 p. (in Russ.)
5. Raygorodskiy, D. Ya (2006), Prakticheskaya psihodiagnostika. Metodiki i testy [Practical psychodiagnostics. Techniques and tests], Sankt-Peterburg: Bahrah-M, 672 p. (in Russ.)
6. Yung, K. G. (2017), Psihologicheskie tipy [Psychological types], Moskva: Akademicheskiy proekt, 540 p. (in Russ.)
7. Ilin, E. P. (2009), Psihologiya voli [The psychology of will], Sankt-Peterburg: Piter, 368 p. (in Russ.)
8. Karelin, A. A. (2007), Bolshaya entsiklopediya psihologicheskih testov [Great

encyclopedia of psychological tests], Moskva: Eksmo, 416 p. (in Russ.)

9. Ilin, E. P. (2019), Psihologiya sporta [Sports psychology], Sankt-Peterburg: Piter, 352 p. (in Russ.)

10. Ilin, E. P., Semenov, M. S. (1972), Psihofiziologicheskie osnovyi fizicheskogo vospitaniya i sporta [Psychophysiological foundations of physical education and sports], Leningrad: Leningradskiy gosudarstvennyiy pedagogicheskiy institut im. A. I. Gertsena, 186 p. (in Russ.)

Received: 25.11.2020.
Published: 21.12.2020.

Information about the Authors

Andriy Poltavets: Ivan Kozhedub Kharkiv National Air Force University: Klochkivska str. 99, Kharkiv, 61058,Ukraine.
orcid.org/0000-0003-0695-4465
E-mail: apoltavec82@gmail.com

Andriy Efremenko: PhD (Physical Education and Sport), Head coach of Germany National Junior team; German Federation of Modern Pentathion: Julius-Reiber-Str. 5, Darmstadt, 64293, Germany
orcid.org/0000-0001-7185-7595
E-mail: rigocepega@gmail.com

Viacheslav Mulyk: Doctor of Science (Physical Education and Srort), Prof., Kharkiv State Academy of Physical Culture: Klochkivska str. 99, Kharkiv, 61058,Ukraine.
orcid.org/0000-0002-4441-1253
E-mail: mulyk.viacheslav@gmail.com

Andriy Kyyko: PhD (Physical Education and Sport); Kharkiv State Academy of Physical Culture: Klochkivska str. 99, Kharkiv, 61058,Ukraine.
orcid.org/0000-0002-6248-3576
E-mail: kiyko8000@gmail.com