



ENSURING STANDARDS OF QUALITY OF LIFE IN A TURBULENT WORLD

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Ensuring Standards of Quality of Life in a Turbulent World

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5.2. Structural study of the levels of health, physical and tactical fitness, functional and psycho-emotional states in Combat Horting athletes

Problem Statement. Successful performance in wrestling, including Combat Horting, a professional applied sport in Ukraine, largely depends on the ability to perform fast, weightlifting, coordinated motor actions during the execution of techniques, as well as endurance and flexibility in the joints causing increased requirements for the level of their physical and tactical fitness during the competitive activity (G. Grihan, K. Prontenko, N. Dovgan, O. Loiko, V. Andreychuk, P. Tkachenko, D. Dzenzeliuk, I. Bloschchynskyi, 2019; M. Weigelt, T. Ahlmeyer, H. Lex, T. Schack, 2011, etc.). Today, according to many experts, one of the promising directions for solving the problem of effectiveness improvement of athletes training system is the enhancement of physical and tactical fitness, functional and psycho-emotional states of athletes, correction of motor action technique, which serves as an important and integral component of a holistic sports training system, since the indicated directions are one of the decisive components in the implementation of athlete's motor potential (F. Degoutte, P. Jouanel, E. Filaire, 2004; D. Kennedy, A. Scholey, N. Tildesley, 2002; G. Korobeynikov, E. Prystupa, L. Korobeynikov, Y. Briskin, 2013; V. Platonov, 2013, G. Grihan, 2011, E. Yeromenko, 2014, etc.).

Analysis of recent research and publications. In recent years, the problem of increasing the physical, technical and tactical fitness in athletes has been studied by a wide range of specialists in various types of martial arts (M. Khoroshukha, G. Grihan, N. Terentieva, P. Tkachenko, O. Petrachkov, B. Semeniv, O. Otravenko, Z. Dikhtiarenko, E. Yeromenko, O. Khurtenko, A. Lytvynenko, 2021; H. Tunnemann, 2013).

A highly qualified Combat Horting athlete must be well prepared physically and possess a high level of speed, strength, flexibility and coordination. Furthermore, in order to endure heavy training loads aimed at the development of proper movement technique and successful performance in competitions, one must also have

a high level of special endurance as well as tactical and technical fitness [2-4; 8-11; 15].

A successful problem solving in improving technical and tactical fitness is impossible without an in-depth study of the structure of athletes' movements, their formation and ways to manage them [16, p. 68; 18, p. 57; 19, p. 230].

It should be noted that tactical training in Combat Horting comprehensively ensures the activity of the athlete depending on the conditions and the situation that has developed in order to achieve success in sports competitions. Nevertheless, during sports improvement of athletes engaged in Combat Horting, the requirements for certain aspects of fitness are not equivalent. This is particularly true of tactical training (H. Tunnemann, 2013), delivering combat and the content of tactics in the opponent characteristics and the plan of actions against them (M. Weigelt, 2011), psycho-emotional modulations in sports (D. Kennedy, 2002), biological techniques in wrestling types (F. Degoutte, 2004).

In the context of our study, the basis of training is the repeated execution of technical elements with the aim of improving the technique of throws and grips, hooks, holds, sweeps, etc. (A. Alekseev, 2013; V. Boyko, 2017; E. Eremenko, 2016; V. Lyakh, 2002; I. Malinsky, 2002; N. Pankratov, 2017, etc.). During such training, the athlete mainly uses the reserve of motor qualities, and their increase does not occur in these conditions, since the efforts developed during the exercise, even a very intense one, are short-lived.

Martial arts (judo, sambo, boxing, hand-to-hand fighting, horting, Combat Horting, etc.) are among the most spectacular competitive sports. The analysis of these literary sources shows that the accumulated array of knowledge related to the issues of the rational construction of the training in Combat Horting is generally based on the research data of competitive activity of athletes during the educational and training process [1-4; 7; 9; 13-15; 17]. Therefore, all known performance parameters are important for achieving high results in sports.

In this regard, improvement of tactical training of highly qualified Combat Horting athletes based on its sports-focused technology (individualization, programming and modelling) is an urgent and important scientific and practical task.

A detailed analysis of the specified aspects raised by the above-mentioned authors led us to the idea of the need for a systematic structural analysis of health level, physical and tactical fitness, functional and psycho-emotional states in athletes engaged in Combat Horting. The results of this analysis are presented in the proposed article [2-4; 9; 15].

Connection with scientific topics. Thus, the choice and theoretical analysis of literary sources on the research topic, the synthesis of relevant publications allow us to conclude that our study is relevant and aimed at implementing the results of research work in secondary and higher education [2-3; 5-9; 13-15]. Therefore, the research is carried out according to the research works: Research Institute of SFBPR UDFS of Ukraine for 2017-2020 on «National sport Horting as a means of physical education of student» (state registration number 0118U001989); for 2021-2026 «Increasing the physical capacity of various groups of people in the process of physical culture and sports» (state registration number 0121U113261).

The aim of the publication. The aim is a structural study of the levels of health, physical and tactical fitness, functional and psycho-emotional states in Combat Horting athletes.

Research material and methods. The study of the level of health, physical and tactical fitness, functional and psycho-emotional states of athletes engaged in Combat Horting was conducted from 2020 to 2022 on the basis of the State Tax University of Irpin, in several stages, including preparatory, summative and formative stages of the pedagogical experiment; final stage.

The summative assessment consisted of 3 stages: I (preparatory) – identification of the level of health, physical and tactical fitness, functional and psycho-emotional states of athletes engaged in Combat Horting; II (summative) – determination of health formation levels, physical and tactical fitness, functional and psycho-

emotional states of athletes engaged in Combat Horting; III (interpretive) – characteristics of health level, physical and tactical fitness, functional and psycho-emotional states of athletes engaged in Combat Horting.

Experimental research of the level of health, physical and tactical fitness, functional and psycho-emotional states of athletes engaged in Combat Horting was conducted in accordance with the methods determined at the level of theoretical analysis. The experimental work included 35 sportsmen engaged in the sports club on the basis of the State Tax University in Irpin. Common characteristics of the respondents are the belonging to the same age group – 17-19 years old.

In order to identify the analysis of health level, physical and tactical fitness, functional and psycho-emotional states of athletes engaged in Combat Horting, a number of diagnostic methods were used at the diagnostic stage of the study, including surveys, specially designed author's questionnaires; psychodiagnostic methods; didactic methods; pedagogical testing; biomedical methods. Each of the methods and techniques had its own target direction and, at the same time, they complemented each other, mutually compensating for the limitations and shortcomings inherent in each of them. These methods were perceived as a way of studying and mastering the complex psychological and pedagogical processes of personality development in Combat Horting athletes during the training, establishment of the objective principles of the conducted research.

Research findings. Discussion. In the course of empirical research, we determined the levels of health, physical and tactical fitness, functional and psycho-emotional states in Combat Horting athletes. We analysed the empirical data obtained during the experimental study.

During the summative assessment, we studied the main indicators of health level, functional and psycho-emotional states, physical and technical fitness of athletes engaged in Combat Horting. Attention was paid to the most informative, standard and accessible tests, which are widely used in training of athletes engaged in Combat Horting [17, p. 45-49].

Express assessment of the level of physical health according to the method of G. Apanasenko [12, p. 33-34] made it possible to obtain initial informative data on individual indicators and their ratio, including morning height, body weight (in the morning on an empty stomach), vital lung capacity (VLC), hand dynamometry, heart rate (HR) at rest, blood pressure (BP), heart rate recovery time to initial values after performing 20 squats (squatting with arms forward) in 30 sec. This technique does not require the mobilization of significant energy by athletes engaged in Combat Horting (Table 1). The score is more dependent on aerobic productivity.

Table 1. The level of physical health of athletes engaged in Combat Horting (n = 35)

Characteristics of physical health under study	Physical health levels				
	<i>Low</i>	<i>Below average</i>	<i>Average</i>	<i>Above average</i>	<i>High</i>
Body mass index $BMI = \frac{\text{body weight [kg]}}{\text{height}^2 \text{ [m]}}$	10.3	15.6	19.6	25.1	29.4
	-2 points	-1 point	0 points	-1 point	-2 points
Life index $LI = \frac{VLC \text{ [l]}}{BW \text{ [kg]}} \times 100$	50 and less	51-55	56-60	61-65	66 and more
	1 point	2 points	3 points	4 points	6 points
Strength index $SI = \frac{\text{hand dynamometry [kg]}}{\text{body weight [kg]}} \times 100$	60 and less	61-65	66-70	71-80	81 and more
	-1 point	0 points	1 point	2 points	3 points
Heart rate recovery time to initial values after 20 squats in 30 seconds (min, sec)	3 and more	2-3	1.30-1.59	1.00-1.29	0.59 and less
	-2 points	1 point	3 points	5 points	7 points
General assessment of health level, points total	3 and less	4-6	7-11	12-15	16-18
Number of athletes with different health levels	3	4	17	8	5
% of athletes with different health levels	6.2 %	13.1 %	40.3 %	29.3 %	11.1 %

The obtained results of the study of physical health level indicate the presence of an average level of health in 40.3% of athletes, 29.3% of athletes had an above average level of health, 11.1% of respondents showed a high level of physical health, the same percentage, 13.1%, had a lower-than-average health index. Two of the subjects showed low health level at 6.2%.

The analysis of indicators of physical development in athletes engaged in Combat Horting showed an average or near average level in almost all characteristics under study (Table 2).

Table 2. The level of physical development of athletes engaged in Combat Horting ($\bar{H} \pm m$) ($n = 35$)

Measurements of physical development				
Body weight, kg	Height, cm	Chest circumference, cm	Right hand strength, kg	Left hand strength, kg
79.2±1.91	178.2±0.56	92.2±1.3	61.3±1.19	58.2±0.72

The obtained results indicate that the athletes engaged in Combat Horting have indicators of physical development in accordance with their age and within the limits of the norm.

The functional status of athletes engaged in Combat Horting was assessed by the characteristics checking cardiovascular and respiratory systems (Table 3).

Table 3. Functional status of athletes engaged in Combat Horting ($\bar{H} \pm m$), ($n = 35$)

No.	Characteristics of the functional state under study	Functional state indicators
1.	Heart rate, (bpm)	71.8±6.41
2.	Systolic blood pressure, mm Hg	110.9±12.01
3.	Diastolic blood pressure, mm Hg.	71.3 1±11.42
4.	Vital lung capacity, ml	3356.11±111.08
5.	Breath-holding after inspiration (Stange test), sec	45.06±5.03
6.	Breath-holding after expiration (Hench test), sec	17.07±3.45
7.	Simple visual motor response time, sec	386.2 1±10.99
8.	Complex visual motor response time, sec	391.4 1±11.8 2

Thus, the respondents engaged in Combat Horting show average characteristics on individual indicators of the functional state, such as the vital lung capacity and the characteristics of the respiratory system including breath-holding after inspiration and breath-holding after expiration. Only 18.3% of athletes had these indicators below the average level.

An increase in heart rate is within acceptable limits, but it requires attention from the coach in sports training for Combat Horting. BP indicators are also within

the physiological norm. The indicator of vital lung capacity in 32.8% of athletes is 3356.8 ml, which shows a weakening of the respiratory muscles, venous congestion in the pulmonary circulation (see Table 3).

According to the table 3, it is determined that the results of hypoxic tests (Stange test, Genchi test), which carry information about the general state of the lung system when holding breath against the background of deep inhalation or deep exhalation, general fatigue, and also allow assessing the oxygen supply of the body and the general fitness level of athletes, show the average level of simple and complex visual-motor reaction time in athletes engaged in Combat Horing. The physical fitness of athletes engaged in Combat Horing was determined according to an integral evaluation system based on the available indices, which are informative and widely used in physical education (Table 4).

Table 4. Indicators of physical fitness in athletes engaged in Combat Horing before the assessment, ($\bar{H} \pm m$), ($n = 35$)

No.	Characteristics of physical fitness under study	Indicators of physical Fitness
1.	Body mass index, kg/m	22.5±1.33
2.	Chest proportionality index, cm	4.2±1.17
3.	Strength index, kg	61.2±1.90
4.	Life index, ml/kg	52.4±2.13
5.	Ruffier Index, conventional units	8.9±1.5 7
Σ	Total points	8-10 points

We obtained a general assessment of the level of physical fitness using the scoring system of T. Krutsevich [18, p. 118-119].

The results of study of physical performance in athletes engaged in boxing according to the following characteristics like body mass index, chest proportionality index, strength index, life index, Ruffier Index, show the reactions of the body to physical load on the part of the cardiovascular and respiratory functional systems (see Table 4.)

As evidenced by the results of the summative stage of the experiment (see Table 4), the results of the study of the initial data of physical capacity in athletes

engaged in Combat Horting, including 69.8% of respondents had 10 points, 11.5% of respondents – 10 points, 18.7% of respondents – 8-9 points, show an average level.

The physical performance of athletes engaged in Combat Horting according to the Ruffier index provides an informative assessment of the functional capabilities of the cardiovascular system in conditions of physical stress, which allows judging the adaptation to muscle work and the patterns of restorative reactions. The analysis of the research results showed that 69.8% had a normotonic response to physical exertion.

The results of the initial data on physical fitness in athletes engaged in Combat Horting showed that the most numerous group among the athletes is represented by young men who demonstrate an average and satisfactory level of physical fitness: $31.10 \pm 2.46\%$ and $35.95 \pm 2.76\%$ respectively (see Table 5).

*Table 5. Analysis of physical fitness in athletes engaged in combat horting (%),
(n = 35), (H ± m)*

No.	Test types	Excellent, %	Good, %	Satisfactory, %	Bad, %
1.	Steady 3000 m run, min	24.8±2.5	42.3±2.2	23.3±1.8	5.9±2.0
2.	Crossbar pull-ups, number of reps	17.9±1.8	32.2 ±2.0	38.3±1.2	9.7±3.8
	Or standing long jump, cm	19.9±1.9	31.9±3.0	33.4±2.9	12.5 ± 3.9
3.	100 m run, sec	17.3±1.1	24.5±1.8	36.3±2.5	7.2±3.1
4.	Shuttle run 4x9 m, sec	19.0±2.1	23.2±2.7	46.9±3.0	9.8±3.3
5.	Sitting posture leaning forward, cm	28.9±2.0	32.9±2.2	32.5±3.1	3.2±3.4
6.	Number of athletes	5	12	15	3
Σ	% total:	20.91±1.97	32.36±2.36	38.16±2.34	8.57±2.46

According to the table 5 we can see that the test of «steady 3000 m run, min.», which characterizes the level of general endurance, is performed by athletes engaged in Combat Horting at 24.8 ± 2.5 , which corresponds to excellent result, and $42.3 \pm 2.2\%$ as good result.

Satisfactory results in tests of «crossbar pull-ups, number of reps» tests are performed at $32.2 \pm 2.0\%$, with excellent results of $17.9 \pm 1.8\%$, and the test

of «standing long jump» is performed with a good result of $31.9 \pm 3.0\%$ and excellent result of $19.9 \pm 1.9\%$ in respondents engaged in Combat Horting.

Thus, the strength qualities of most athletes engaged in Combat Horting at the beginning of the school year are at a satisfactory level. The speed physical qualities represented in our study by «100 m Run» test reveal the following data in athletes engaged in Combat Horting: an excellent result was shown by 17.3 ± 1.1 and good result by $24.5 \pm 1,813.7\%$, which indicates insufficient development. Only $20.91 \pm 1.97\%$ of athletes aged 17-19 have a high level of physical fitness in all indicators.

In general, $53.27 \pm 4.59\%$ of Combat Horting athletes had an average and high level of physical fitness at the beginning of training sessions in the sports club on the basis of the State Tax University of Irpin, whereas 46.73% of athletes had a satisfactory and low levels.

Empirical studies of the psycho-emotional state of Combat Horting athletes were conducted with the use of a complex of methods.

The research was carried out by testing using informative methods, which are widely used in the educational and training process for the Combat Horting clubs, including general state, alertness, mood, need for achievement and self-assessment of the qualities inherent to the athletes under study (according to their own opinion), which are defined in Table 6.

As we can see from Table 6, the young men's perception of their own general state, alertness and mood indicates an exaggeration of self-esteem from these indicators in almost 72% of athletes engaged in Combat Horting. The assessment of the need for achievement also shows an average and relatively high level in Combat Horting athletes. 39.9% of athletes demonstrated an average level, 38.77% of athletes demonstrated a high level, and only 21.33% of Combat Horting athletes demonstrated a low need for achievement. Thus, the need to achieve a certain level of physical fitness in 75.9% of athletes engaged in Combat Horting is relatively motivated by the achievement of successful results in sports mastery.

Table 6. Psycho-emotional state of athletes engaged in Combat Horting

$$(\bar{H} \pm m), (n = 35)$$

No.	Characteristics of psycho-emotional state	Indicators of psycho-emotional state of athletes, %		
		Low	Average	High
1.	General state,	27.11±2.11 (3)	44.05±1.12 (4)	28.84±10 (6.4)
2.	Alertness	22.98±1.10 (3)	44.25±0.41 (4)	32.77±1.9 (6.0)
3.	Mood	22.11±2.0 (3)	42.91±0.68 (5)	34.98±1.3 (6.1)
4.	Need for achievement	21.33±0.5 (10.3±0.8)	39.9±2.71 (13.01±1.1)	38.77±1.41 (14.11±0.8)
5.	Self-esteem (according to Budasi), conventional units	18.73±0.5 (0.37)	39.49±2.78 (0.58±0.91)	41.78±2.11 (0.82)
	Average indicator of mental state in persons under test, %, number	20.7% (6 persons)	41.4% (17 persons)	37.9% (12 persons)

Regarding personality self-esteem according to the method of S. Budasi, it was found that 41.78 Combat Horting athletes have high self-esteem, which is 0.82 conventional units. The overestimated self-esteem in athletes shows the lack of acceptance of their own mistakes, unwillingness to accept defeat in the environment, to look better, but taking into account these indicators, it is possible to quickly create necessary motivation for specific physical and sports activities. It should be noted that almost all athletes (85%) put such character traits as persistence (25 points), courage (21 points), efficiency (19 points), cheerfulness (17 points), discipline (18 points) in the first place. Athletes consider as negative traits of their character the following ones: resentment (3 points), nervousness (2 points), suspiciousness (1 point), which negatively affect training effectiveness and the achievement of high sports results.

Thus, structural improvement of the level of health, physical and tactful fitness, functional and psycho-emotional state of athletes engaged in Combat Horting point out the need to protect their manifestations at the stages of preparation to the highest attainment and maximum realization of individual abilities, which serve an important reserve for attaining high sports results.

Conclusions from this study and prospects for further research in this direction. A structural study of the level of health, physical and tactical fitness, functional and psycho-emotional states in athletes engaged in Combat Horting showed that one of the most important components of achieving a high sports result is sports preparedness, which is ensured by the performance, efficiency and stability of sports training. The analysis of the initial data of physical health, physical and tactical fitness, functional and psycho-emotional states in Combat Horting athletes indicates the presence of an average level of manifestation. Almost all the studied indicators were at the level below average and average. This conditions the need for further research in the direction of training of Combat Horting athletes and the development of new technologies in the educational and training during Combat Horting classes for the development of health level, physical and tactical fitness, functional and psycho-emotional states, the implementation of which will ensure a high positive outcome in solving the specified task.

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5.2. Nadiia Dovgan, Olena Otravenko, Anatoliy Dehtyaryov. Structural study of the levels of health, physical and tactical fitness, functional and psycho-emotional states in Combat Horting athletes. The data of summative assessment results of the structural study of the level of health, physical and tactical fitness, functional and psycho-emotional states were presented by the authors of the article Structural study of the levels of health, physical and tactical fitness, functional and psycho-emotional states in Combat Horting athletes. The results obtained at the end of the first stage of the assessment aimed at motivation identification in athletes engaged in Combat Horting. The levels of physical health, physical fitness, functional and psycho-emotional states are also determined. Dependencies between indicators of health levels, physical development and physical fitness, functional and psycho-emotional states in Combat Horting athletes were elucidated.

5.3. Kostiantyn Kukushkin, Eduard Yeromenko, Zoia Dikhtiarenko, Larisa Grechana. The prospectives of Combat Horting in the military patriotic education of a successful personality: pupils, students and cadets (experimental work). The authors of the publication through the listed projects, measures of national-patriotic education aimed at the formation and development of pupils, students and cadets of such important socially significant qualities as civic maturity, love for the Fatherland, responsibility, sense of duty, loyalty to national traditions, the desire to preserve and strengthen historical and cultural values. The development and formation of these qualities will contribute to the growth of activity of this contingent in solving the most important problems of society. Theoretically revealed the ability of Combat Horting to form a military-patriotic education in a successful person: pupils, students and cadets. The questions developed by K. Kukushkin and L. Grechana for a specific category of persons on the topic: «The prospectives of Combat Horting in the military patriotic education of a successful personality: pupils, students and cadets» (experimental work) are listed.

5.4. Zoia Dikhtiarenko, Andrii Steshyts, Vitaliy Kostenko. The influence of vitamins on the preservation and strengthening of health in school and student youth, cadets: Combat Horting athletes (experimental work). The authors of the scientific publication «The influence of vitamins on the preservation and strengthening of health in school and student youth, cadets: Combat Horting athletes (experimental work)» listed the main regulatory and legal documents of Ukraine, which provide for the preservation and strengthening of the health of Ukrainians; the topics of conversations (author Z. Dikhtyarenko) are listed. These topics are desirable to conduct during training, the educational process, and, especially, remotely, in order to preserve and strengthen the health of Combat Horting athletes (and, if possible, under conditions of martial law). And questions for pupils and student youth, cadets (author V. Kostenko), and also multiple choice questions for pupils and student youth, cadets (authors A. Steshyts and V. Kostenko). Based on the developed questions (author A. Steshyts), Z. Dikhtyarenko developed a table: «Levels of knowledge formation after listening to conversations on a general topic: «The influence of vitamins on the preservation and strengthening of health by school and student youth, cadets: sportsmen of Combat Horting».

Z. Dikhtyarenko and A. Steshyts agree that the development of the structure and components of the concept of «health» in scientific literature has acquired various modifications many times: physical, mental, spiritual (graphic representation

Part 5. Combat Horting as a means of physical education of a harmoniously developed, successful, a vitally active personality – pupils, students and cadets: results of research work

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