https://doi.org/10.52449/1857-4114.2022.39-1.06
CZU: 796.015+796.322: 796.032

TECHNICAL-TACTICAL TRAINING SYSTEM OF PERFORMANCE HANDBALL PLAYERS IN AN OLYMPIC CYCLE

Verejan Galina[1]
https://orcid.org/0009-0000-5441-7061
[1]*Universitatea de Stat de Educație Fizică și Sport, Chișinău, Republica Moldova*

Abstract. *The technical-tactical training of performance handball players in an Olympic cycle is the science of a psycho-pedagogical process of global training carried out systematically and continuously, adapting the body to the physical, functional, mental and technical-tactical efforts to achieve the sports performances specific to the annual training macrocycles. The training process in an Olympic cycle represents a specialized system in the design and achievement of specific skill objectives at the level of training activities.*

The methodology of sports training is adjusted to match modern training requirements, restructured according to the demands of scientific research. Scientific research methods have led to the experimental method, which comprises a set of rational procedures followed through three fundamental stages:

1) pre-testing performance handball players, through which the level of psychomotor and technical-tactical capacities was evaluated, at the beginning of each annual macrocycle during an Olympic cycle;

2) organization of the technical-tactical training process of performance handball players in four stages of advanced training and sports mastery;

3) post-testing, which allowed measuring the progress of psychomotor and technical-tactical capacities, after each annual macrocycle of the Olympic cycle.

Keywords: *the interaction of technical-tactical capabilities, performance handball players, Olympic training cycle, psychomotor skills, sports mastery.*

The relevance of the research topic. Handball is a collective sports game with a pronounced dynamic character, because it takes place in motion, most of the time, speed running. The individual's motor capacity is a complex reaction to environmental stimuli. This includes in a characteristic unit several elements, such as: psychomotor skills, moral volitional skills, all influenced, structured diversely and potentiated, at different levels, by the natural maturation of practice functions and internal motivational factors [4].

The effectiveness of any technical-tactical activity is conditioned by the good functioning of all the systems of the human body, which manifests itself through a psychomotor characteristic called coordination. In sports activity, psychomotricity constitutes a constitutive element of a whole complex of capacities [3, 6, 7, 11].

The purpose of the research consists in perfecting the training system in an Olympic cycle (4 years), with a view to the psychomotor and technical-tactical training of performance handball players.

In order to achieve the goal, the following **objectives** are treated**:**

1. The study on the theoretical-scientific and practical approaches in order to essentialize the technical and tactical dimensions of the handball athletes training for a period of 4 years;

2. Elaboration of the experimental methodology regarding the determination of the effective and necessary technical-tactical elements of modern handball, as well as the

possibilities of their interaction, in order to obtain the highest results;

3. Appreciation of the efficiency of the developed experimental methodology and its argumentation for determining the optimal approach regarding the technical-tactical training of performance handball players in an Olympic cycle;

Hypothesis intended for research, it is realized that the development and use in practice of a modernized system of technical-tactical training of performance handball players and programming of training activities on training forms and on specific directions of action will contribute to achieving the results of sports mastery in the macrostructure of the Olympic cycle.

Scientific research methodology.

The methodological and technical-scientific foundation of the work constitutes the fundamental scientific concepts of the development of the technical-tactical capacities of performance handball players in an Olympic cycle. In order to achieve these concepts, the following methods were used [3, 5, 6, 8, 10]: the research of the theoretical-conceptual, methodological and practical essences presented in the specialized literature; the pedagogical observation method; the conversation method (the interview); the method of testing psychomotor and technical-tactical capacities; testing the modeling of technical-tactical training; the pedagogical experiment method; the statistical-mathematical method of processing the collected data; comparative method based on statistical data; graphical and tabular method.

The information data were selected, processed and interpreted with a clear picture of the achieved stage and development prospects in the treated objectives [6].

Scientific novelty and originality lie in the development and argumentation of the implementation technology of the technical-tactical training program for performance handball players over the 4-year Olympic cycle.

The applicative value of the work is reflected in the possibility of applying the technology of sports training in practice by improving the system of psychomotor and technical-tactical preparation, which can influence the achievement of superior parameters within the training process at various stages of sports mastery in a 4-year Olympic cycle.

The results investigated.

Technique and technical training are two different concepts. The technique is defined by the text, in the definition, while technical preparation encompasses the entirety of methodical and organizational measures established in the training process with the aim of correctly acquiring a technique specific to the sport branch [7].

Fundamental technical procedures are adopted for the quality of some motor skills. Motor skills build on motor skills. The initial level of coordination skills plays a key role in shaping motor abilities, which consist of integrated motor actions or components that become automatic through consistent repetition. Automation releases consciousness (of that act) allowing the athlete to focus on the goal of the action and developing anticipation. The correct learning (in which repetition is the basic means) of the technique implies (by automating the execution) making the most correct tactical decisions [1, 9].

The learning of technical-tactical procedures depends on different degrees of complexity (exercise duration, degree of use of motor skills) or on the closed or open nature of the activity (skill). "Closed skill", define skills where the environment is predictable. "Open skills" define the skills in which the environment is unpredictable [9, 11].

Tactical mastery is based on deep theoretical knowledge and the ability to apply tactics according to the particularities of the competition. Tactical training often involves the following objectives [7, 9, 12]: studying the fundamentals of sports strategy; studying the laws and regulations of competitions in the

respective sport or event; analyzing and knowing the tactical qualities of the best athletes in the sport practiced; researching the strategy of future opponents and their physical and psychological potential; examining the unique characteristics of the environment where upcoming competitions will be held ; developing individual tactics for the next competition, based on strengths and weaknesses, in the light of the last two aspects; analysis of past performances with a view to facing future opponents; learning and repeating this pattern in training until it becomes a dynamic stereotype.

Mastering a tactic follows the same principles as mastering a skill. It relies on repeated practice within a structured theoretical framework. Because tactical training depends on good technique and good physical training, a tactical action will be preceded by adequate physical and technical training.

The training process within the Olympic macrosystem is best captured by the concept of "interaction." This term highlights the dynamic influence of active participation on the intensification of training across each annual macrocycle , as a reciprocal causal action, starting with advanced training 5 and sports mastery that it is the basis of physical, technical-tactical, competitive performances, it manifests itself in a direct mutual influence [12].

In the process of training interaction, different kinds of links between the contents of sports training are manifested. The correct ratio of the planning system between macrocycles and microcycles of training largely determines the success of the entire training process in an Olympic cycle.

When analyzing the interaction of the values of the fundamental technical-tactical capabilities of the handball players, the links in question and effect must be taken into account, in each mesocycle of the annual cycle, discovering the most important and fundamental ones, which subsequently gives us the opportunity to plan more successfully the new stages of training improvement in the Tables 1 – 3.

The control parameters were checked according to the tests in Table 1 with a team of 26 performance handball players, at the technical-tactical tests mentioned in the table. When passing the ball in pairs from the spot for 30" (no. repetitions) at the initial testing of advancement both groups were homogeneous. The calculated value of Student's t criterion compared to its tabular value indicates insignificant differences between the results of the experimental groups under conditions of advancement ($t=0.041$, $P>0.05$).At the final testing of the advancement training period the calculated value of **t** Student criterion highlights insignificant differences between the results obtained when passing the ball in pairs from the spot for 30", due to the lack of dynamism, the performances being almost equal with a difference of 0.60 units where $t=1.408$, $P>0.05$.

Special exercises to increase the intensity of positive dynamism influenced the development of movement reaction capacities and explosive force when passing the handball in pairs while running, the results being significant at the final test ($t=5.348$, $P<0.001$) in the experimental group, considering more effectively the action of passing the ball in pairs from the run.

Specifically, the experimental group in their advanced 5th year of training showed significantly better results compared to the control group in several key drills: the 30-meter dribble, the 30-meter dribble between posts, dribble-throw-rebound, and the triangle movement with dribble and throw. These findings are clearly outlined in Table 1, demonstrating the superior performance of the experimental group across these technical exercises.

Table 1. Comparative analysis of the value of technical-tactical capabilities of performance handball players during the advancement period, the 5th year of training in the first macrocycle of the Olympic training cycle

No. crt.	The parameters tested	Gr. exp.	Statistical significance		t	P
			Initial testing advancement	Initial testing advancement		
			$\bar{x}$± m	$\bar{x}$± m		
1	Passing the ball in pairs from place 30" (no. of repetitions)	E	10,71±0,235	11,93±0,235	5,495	<0,001
		M	10,67±0,946	11,33±0,355	0,840	>0,05
		t	0,041	1,408		
		P	>0,05	>0,05		
2	Passing the ball in pairs from the run (s)	E	5,16±0,010	5,12±0,010	2,898	<0,05
		M	5,36±0,117	5,56±0,124	1,852	>0,05
		t	1,709	5,348		
		P	>0,05	<0,001		
3	Dribling 30 m (s)	E	5,34±0,039	5,18±0,023	4,923	<0,001
		M	5,38±0,053	5,32±0,053	2,510	<0,05
		t	0,606	2,179		
		P	>0,05	<0,05		
4	Dribbling 30 m between the goalposts (s)	E	6,25±0,023	6,20±0,015	2,778	<0,05
		M	6,42±0,097	6,43±0,071	0,128	>0,05
		t	1,707	3,168		
		P	>0,05	<0,01		
5	Dribble-throw-rebound (s)	E	12,44±0,038	12,29±0,035	4,286	<0,001
		M	13,29±1,10	12,58±0,098	0,680	>0,05
		t	0,772	2,788		
		P	>0,05	<0,01		
6	Triangle move-dribble-shoot (s)	E	12,49±0,037	12,36±0,038	3,714	<0,01
		M	12,57±0,096	12,73±0,089	1,928	>0,05
		t	0,777	3,822		
		P	>0,05	<0,001		

Note: n=14+12=26f=24t=2,064; 2,796; 3,745 .
n=14 f=13 t=2,160 3,012 4,221
n=12 f=11 t=2,201 3,106 4,437
P=0,05 0,010,001

The obtained data demonstrate to us the result of a scientifically conducted training process is an importance regarding the development of motor and mental qualities and a high acquisition of technical-tactical skills during the preparation period of the first macrocycle of 2 years of the Olympic cycle.

The continuous of motor training of handball players in terms of the development to a higher degree of the specific motor qualities of the athletes they train in, advanced year 5, allows them to reach the working capacities in the stage of the first year of sports mastery.

The data collected during the first year of sports mastery, concerning the development of the technical-tactical qualities of handball players, are displayed in Table 1.2. The testing results indicate that the effective functioning of the muscular system, essential for the harmonious development of the lower limbs, trunk, and arms, is a result of specific technical-tactical exercises. These exercises

lead to significant transformations in the musculature of handball players aged 15-16.

The effects of special exercises for a good increase in dexterity and coordination of movements, were obtained by multiple repetition of motor actions: the player is allowed to move forward, sideways and backwards, at first walking, later in light running in a straight line , in a winding line and with changes of direction. As the player gains confidence in driving the ball, the speed of movement on the field will also increase.

The improvement of dribbling will be done through exercises of varied movement on the field, in conditions of speed with changes of direction, with meandering through obstacles, in the fight with the semi-active and active opponent, in competitions in the form of relays and during training games.

The results are significant in the experimental group, which was demonstrated superior performance in Tables 1, 2, 3.

Table 2. Comparative analysis of the value of technical-tactical capabilities of performance handball players during the sports mastery period 1st year and sportsmanship 2nd year of training

No. crt.	The parameters tested	Gr. exp.	Statistical significance		t	P
			Initial sportsmanship testing year 1	Initial sportsmanship testing year 1		
			$\overline{x}$± m	$\overline{x}$± m		
1	Passing the ball in pairs from place 30" (no. of repetitions)	E	11,93±0,235	12,57±0,235	2,883	<0,05
		M	11,33±0,355	12,00±0,177	2,343	<0,05
		t	1,408	2,176		
		P	>0,05	<0,05		
2	Passing the ball in pairs from the run (s)	E	5,12±0,010	4,82±0,010	2,190	<0,05
		M	5,56±0,124	5,49±0,133	0,609	>0,05
		t	5,348	4,036		
		P	<0,001	<0,001		
3	Dribling 30 m (s)	E	5,18±0,023	5,06±0,023	5,45	<0,001
		M	5,32±0,053	5,20±0,044	2,727	<0,05
		t	2,179	2,80		
		P	<0,05	<0,05		
4	Dribbling 30 m between the goalposts (s)	E	6,20±0,015	6,15±0,014	3,570	<0,01
		M	6,43±0,071	6,39±0,071	0,635	>0,05
		t	3,168	3,315		
		P	<0,01	<0,01		
5	Dribble-throw-rebound (s)	E	12,29±0,035	12,34±0,029	2,94	<0,05
		M	12,58±0,098	12,75±0,097	1,954	>0,05
		t	2,788	4,057		
		P	<0,01	<0,001		
6	Triangle move-dribble-shoot(s)	E	12,36±0,038	12,32±0,037	2,353	<0,05
		M	12,73±0,089	12,64±0,090	1,125	>0,05
		t	3,822	3,289		
		P	<0,001	<0,01		

Note: n=14+12=26 f=24 t=2,064 2,796 3,745
n=14 f=13 t=2,160 3,012 4,221
n=12 f=11 t=2,201 3,106 4,437
P = 0,05 0,01 0,001

Table 3. Comparative analysis of the value of the technical-tactical capabilities of performance handball players during the sports mastery year 2 and 3 of the Olympic cycle

No. crt.	The parameters tested	Gr. exp.	Statistical significance		t	P
			Final testing of sportsmanship year 2	Final testing of sportsmanship year 2		
			$\bar{x}$± m	$\bar{x}$± m		
1	Passing the ball in pairs from place 30" (no. of repetitions)	E	12,57±0,235	13,50±0,235	4,198	<0,001
		M	12,00±0,177	12,41±0,226	2,216	<0,05
		t	2,176	3,344		
		P	<0,05	<0,01		
2	Passing the ball in pairs from the run (s)	E	4,82±0,010	5,07±0,102	2,577	<0,05
		M	5,49±0,133	5,48±0,115	0,052	>0,05
		t	4,036	2,662		
		P	<0,001	<0,05		
3	Dribling 30 m (s)	E	5,06±0,023	4,89±0,031	6,538	<0,001
		M	5,20±0,044	5,10±0,035	2,777	<0,05
		t	2,80	4,468		
		P	<0,05	<0,001		
4	Dribbling 30 m between the goalposts (s)	E	6,15±0,014	6,09±0,017	4,000	<0,001
		M	6,39±0,071	6,26±0,062	2,167	<0,05
		t	3,315	2,656		
		P	<0,01	<0,05		
5	Dribble-throw-rebound (s)	E	12,34±0,029	12,26±0,024	3,200	<0,01
		M	12,75±0,097	12,66±0,092	0,301	>0,05
		t	4,059	4,211		
		P	<0,001	<0,001		
6	Triangle move-dribble-shoot(s)	E	12,32±0,037	12,22±0,030	3,125	<0,01
		M	12,64±0,090	12,61±0,0913	0,370	>0,05
		t	3,289	3,538		
		P	<0,01	<0,01		

Note: n=14+12=26 f=24 t=2,064 2,796 3,745
n=14 f=13 t=2,160 3,012 4,221
n=12 f=11 t=2,201 3,106 4,437
P = 0,05 0,01 0,001

The results obtained in the experimental conditions and in the condition of systematic control over the technical-tactical development were recorded in absolute values.

From a statistical perspective, the experimental group achieved notable results compared to the control group, as shown in Tables 1, 2 and 3.

For the pass thrown with one hand from above (over the shoulder): in the execution of this pass from the spot, the player will have the fundamental position adopted for the attack game, with the leg opposite the throwing arm in front and the weight more on the back leg. The ball is held (or balanced) with one hand above the shoulder, with the arm bent at the elbow joint at approximately 90 degrees. At the moment of throwing, the impulse given by the extension of the rear leg produces a chain impulse to the other participating segments: the extensor muscles of the throwing arm, chest, shoulder, abdominal and back, as well as the lateral parts of the body.

The succession and gradation of technical-tactical exercises, as well as their progression in a four-year Olympic cycle, are

rigorously planned taking into account the training stages within the training periods, varying from easy execution procedures to medium and optimal ones, at the end of the Olympic cycle. In the training process, apart from pedagogical tasks, a series of psychophysiological objectives were also consciously pursued, such as the conscious learning of motor skills, the development of psychomotor qualities of motor activities: speed, strength-speed, skill and .a. The realization was planned in parallel and closely linked with technical-tactical elements, developing the background of the global and integral improvement of the body functions of the handball players, characterized by different and complex technical procedures of alternating attack and defense phases, different pace of carrying out the training actions.

The results of the pedagogical experiment demonstrated that the acquisition of the technique of handball elements is conditioned by the formation of motor skills that constitute the content of the training process during the preparation periods of the annual training cycles. Along with the technical-tactical development, the quality indicators recorded at the end of the stages of advanced training and sports mastery are also perfected.

Achieving the objectives of the experimental model offers the possibility:

a) the correct choice of the technical-tactical learning units and the precise request of the learning capacities necessary to achieve them in each macrocycle of the Olympic cycle;

b) the design of learning strategies "focusing" rigorously on the pursued "targets", which will guide the activity of performance handball players in each stage of sports training;

c) the continuous, formative evaluation of the results, through permanent reporting to the operational directives of the model;

d) ensuring the progress of psychomotor and technical-tactical training indicators every year of the 4-year Olympic cycle, achieving the performance objectives.

The important thing is that the efficiency of the technical-tactical training process depends on many factors, but first of all the training methodology - an integral part of sports training.

The methodology serves as an integral part of the didactic technology within the training system and represents the conception of the assembly of methods and procedures that direct the training process at each stage.

The learning methods used in each multi-year training cycle are in an interdependence/interaction relationship with the learning content, constituting the very logic of organizing the stadium content of the Olympic cycle. The objectives have a trend of progress compared to the control group, and at the level of the proposed content we can intervene in the case of the completion time allocated to the training activity and the degree of difficulty of the proposed sports skills, relying on the inclusion of handball-specific technologies at the stage of sports mastery.

Conclusions.

1. The pedagogical experiment revealed positive outcomes in the final assessments, reaffirming the formative values of technical-tactical training within an Olympic cycle and the achievement of the proposed objectives.

2. 2. The results obtained within the ascertainment experiment regarding the evaluation of the dynamics of the statistical indicators of the motor and technical-tactical training factors in the Olympic training cycle subject to verification. Successively in the order of the experimental approach, the existence of a relationship between the mode and the type of interaction of the motor and technical-tactical capacities in each annual macrocycle of the sports training of the Olympic cycle was highlighted.

3. It was argued that following the application of the experimental programs in the macrocycles of the Olympic cycle, but also following the comparison of the initial results

with the final ones, the physical and technical-tactical training indicates a progressive dynamic, which confirms that these indicators are perfectible. The calculated value of the Student's t criterion of the motor and technical-tactical capacities of the handball players demonstrates a significant difference at P<0.05-0.001 compared to the control group.

References:

1. BUDEVICI, A., VEREJAN, R**.** *Bazele teoretice şi metodica predării handbalului*. Curs universitar pentru alolingvi. Compendiu. Chişinău. „Valinex SRL, 2010. 168 p. ISBN 978-9975-68-132-2.
2. CREȚU C. Modelul succesul global. În: *Psihopedagogia succesului*. Iași: Polirom, 1997, p. 54-68. ISBN 973-683-010-1.
3. EPURAN, M., MAROLICANU, M. *Metodologia cercetării activităţilor corporale.* Cluj-Napoca: Risoprint, 2002, p. 32. ISBN 973-656-236-0.
4. EPURAN, M., (1976), *Psihologia educaţiei fizice şi sportului*. Bucureşti: Sport - Turism, p. 25-125.
5. GOIAN, N. *Prelucrarea informației.* Manual pentru bibliotecile publice. Vol.1, Chișinău: CEP USM, 2015, p.12-15. ISBN 978-9975-71-841-7.
6. ISTRATE, E. Cercetarea pedagogică. În: *Manual de pedagogie*. Coord. Jinga I., Istrate E., Cap.3 București: ALL Educațional, 2001, p.61-76. ISBN 973-684-4.
7. MANNO, R. Pregătirea sportivă la copii şi adolescenţi. În: *Efecte ale practicării sportului de performanţă la copii şi juniori*. Bucureşti: C.C.P.S., nr. 102(1). 1996. p. 60-80.
8. ZAVALIȘCA, A., DEMCENCO, P. *Metode matematico-științifice în cercetarea pedagogică în cultura fizică*. Chișinău: Pontos, 2011, p. 490. ISBN 978-9975-51-219-0.
9. ИГНАТЬЕВА, В.Я. *Гандбол. Подготовка игроков в спортивных школах.* Учебно-методическое пособие. Москва: Советский спорт, 2013, 288 с. ISBN 978-5-9718-0670-7.
10. КОТОВ, Ю.Н. Информативность тестов оценки технического мастерства гандболистов на этапе спортивного совершенствования. В: *Современная наука: Актуальные проблемы и пути их решения*, 2017, № 2 (33), с. 116-117. ISSN 2307-8782.
11. МАРЧУК, С.А. *Теория и методика физической культуры.* Учебное пособие. Екатеринбург: УрГУПС, 2017, 112 с. ISBN 978-5-94614-403-2.
12. МАТВЕЕВ, Л.П. Модельно-целевой подход к построению спортивной подготовки. В: *Теория и практика физической культуры*, №2, 2000, с.28-37. ISSN 0040-3601.