

# STUDY ON THE PHYSICAL CAPACITY DEVELOPMENT FOR THE HANDBALL PLAYER, JUNIOR II, ITEM OF THE SPECIALIZED AS BACKCOURT

TOHĂNEAN DRAGOȘ IOAN<sup>1</sup>, TALAGHIR LAURENȚIU-GABRIEL<sup>2</sup>

<sup>1</sup>Faculty of Physical Education and Mountain Sports, Transilvania University from Brașov

<sup>2</sup> Faculty of Physical Education and Sports, Dunarea de Jos University from Galati

[dragos.tohanean@unitbv.ro](mailto:dragos.tohanean@unitbv.ro), [gtalaghir@ugal.ro](mailto:gtalaghir@ugal.ro)

Abstract:

The research is exploratory and descriptive study, whose target population a total of 30 athletes, practitioners of the handball game, members of the junior level II (15-16 years old) - men's 6 teams. Subjects were randomly assigned into 2 groups (experimental and control) by 15 athletes. The overall conclusion of this study is that specific physical capacity through specific physical training leads to an improvement index, which is the medium in which further enhance technical and tactical skills.

Keywords: physical training, evaluation, development, handball

## Introduction

Physical capacity is the third structural component of the handball game which enhances essentially full capacity of performance for the athlete and team. The phrase "physical capacity" proved to be quite difficult to delimit the concept by the specialists in sports, especially due to confusion with the "physical training".

According to the Dictionary of Science Sports Science and Medicine boats first notion is defined: "A measure of the ability of active muscle systems to deliver, by [aerobic metabolism](#) or [anaerobic metabolism](#), energy for mechanical work, and to continue working for as long as possible.

This capacity increases through training". (Kent M., 2006). The case for using the concept of physical capacity rather than physical preparation is fully argued, because the ability of the model is a noticeable component of the game and is distinguished by a behaviour for demonstrated performance and physical preparation is a component of the training model dealing with instructional strategy (Colibaba-D.E., Bota I., 1998).

The notion of capacity is complex, assuming the presence of inherited skills, natural and acquired and formative structures that correlate with such knowledge, abilities, skills and driving skills, leading to the manifestation of performance activities. Making an effort to synthesis of opinions of experts, Oancea V. (2007) highlights the content elements of physical fitness:

- morphological and functional evidence that refers to the qualitative development of the muscles and joints and major body functions,
- indices of health refers to the need to ensure the functioning of all organs and usually at a higher level, decisive performance condition,
- the driving qualities, degree of development refers to the speed, strength, endurance, skilful, mobility,
- some driving skills and abilities that relate to the whole motive of acts which due to their structure condition the technical and tactical execution.

Morpho-functional indices refer to "the degree of development of the individual in terms of its exterior dimensions (height, weight, size, diameter, perimeter, etc.), and the degree of functionality that are capable devices, organs or systems that individual" (Prescornită, 2006).

If morphological characteristics are determined in a large proportion of genetically and can thus be less influenced by training, definitely in the functional development may be significantly conditioned by physical exercise. Physical traits of the individual qualities are more or less perfect, driving shares of accompanying events.

Balint E. (2004) consider that the required "physical qualities in the game of handball are:

- execution speed, displacement and reaction,
- general and specific resistance,
- coordination capacity related kinesthetic qualities analyzers (example: the touch, which translates into the game with "ball sense", at optical which allows assessment of the distance and speed fine bird / throw "sense of distance", etc.
- explosive force to the upper and lower limbs."

The technical-tactical center backcourt player (Balint E., 2006).

Attack: Phase 1.

1. Launching the counterattack as the intermediary, marking entry into possession of the ball and passing to the top of the center.

Phase 2.

1. Running accelerated.
2. Launching attack by short and medium passes at high speed.
3. Throwing the gate running, jumping enthusiastically from the steps or jump.
4. Passing of engaged in the dive, in pronation with the "ground" (that is below the floor).
5. Overcoming opponent changes direction at high speed.

Phase 3.

1. Passing the successive penetration, threw over the shoulder of pronation, pushed to the ground.

Phase 4.

1. Throwing the ball to the goal completion:

- the momentum jump as high or avoidance, in addition to push hip-short,
- the battle on both feet jump,
- from foot jump shot from the arm side,
- of the support on the ground, cross-step, by step mattress, with added step,
- from running,
- besides the hip or to the knee,
- the avoidance of the support or jump.

2. Passing of engaged:

- direct, in pronation, the back, the ground from jumping.

3. Movements misleading

- single and double change of direction (one or both legs),
- feint to throw at the gate followed by excess or pass,
- feint of care followed by excess, throw, or pass.

4. Tactical actions:

- single or double crossover,
- input in front, blocking, leaving the blockage,
- temporary entrance on the pivot,
- short and long enveloping even the extreme position.

### **General considerations effort in the game of handball**

Handball is characterized by complex motor activity and a greater dynamism. While the trunk and upper limbs performed various movements, which requires all chains strong muscular legs, in addition to running dynamic activity also play an important role in static balance and ensure support for the movements of the trunk and lower limbs.

During the training exercise promotes motor skills development, and therefore increase the body's organs and systems adapt to the applications submitted. Thus, some organs and systems to reach the highest level of their functional capacity, while others are still far behind. Therefore, specific effort must be driven very fair.

From the physiological point of view, the effort to handball a joint effort with greater aerobic weight, characterized by the predominance of medium intensity for longer calls.

In general, all the experts agree that the effort in training and competitions took place traditionally is an effort to speed treatment resistance. Work is carried out in aerobic conditions almost completely oxygen supply during exercise. Only the first 2-3 minutes, until the capture and transport systems enhance their functional oxygen, oxygen deficiency is working. After this period, depending on the level of actual oxygen consumption, we distinguish two types of behaviour. One is the stable (steady-state), relative when oxygen consumption per minute is close to the limit of maximum heart rate has a similar pattern of oxygen consumption behaviour in the sense that it stabilizes at values of 150-180 b / min.

The relative steady state conditions, the body can work about 60 minutes. Another is the true stable state, where the heart rate stabilized at 110-130 b / min (Bota, 1989). Although the aerobic system is the primary energy source in the samples takes 2 minutes and 2 to 3 hours, both systems use energy in different proportions.

The two systems almost overlap. During exercise. A good indicator of the energy system that contributes most to making a specific year handball is the level of blood lactic acid. During slow driving actions, lactate remains only slightly above its level at rest and increased significantly only when muscles produce more lactate than the other tissues of the body removed.

Threshold of 4 millimoles of lactic acid accumulated in the blood is considered to be an indicator of anaerobic and aerobic systems that have contributed equally to the resynthesis of ATP. This threshold of 4 millimoles of lactic acid has an equivalent threshold heart rate of 168-170 beats per minute (Bompa, 2002). If lactic acid level is less than four millimoles, means that the system was predominantly anaerobic lactic acid, and if the level is lower, resulting an increased contribution of the aerobic system.

#### **DESIGN, SUBJECTS, TESTS**

The research is an exploratory and descriptive study, whose target population is a total of 30 **athletes**, practitioners of the handball game, members of 6 men teams from Braşov and Făgăraş, junior level II (15-16 years old). The subjects were randomly assigned into 2 groups of 15 athletes (experimental and control). The research purpose is to verify in practice the athletic training at the junior level II of the players specialized as backcourts, as well as the present interest of the dynamic pattern and to update this model by referring to current requirements imposed by the dynamics of the handball game today.

The **objective** of this research is to highlight the manner and means by which the system develops at an optimal level of physical ability of the handball player.

Specifically, we pursued the following **objectives**:

- Identifying the level of physical preparation of the athletes subjects to this study.
- Selecting the operating systems by following the principle of rationalization and standardization.
- Highlighting any differences between the athletes at the dynamic level of the groups.

We have chosen four dynamic **tests** that are part of a series of tests provided by the Romanian Handball Federation (FRH) for this stage of sports training.

These are:

1. The test of Throwing the handball.
2. Ten jumps.
3. 10x30m speed running.
4. Cooper 12 ' Test.

**1. The test of Throwing the handball** - the ball will be thrown with three steps. Disposal will run behind a line drawn on the ground line that should not be touched. It will run two throws and will take into consideration the best.

**2. Ten jumps** (decajump) - sample consists of 10 steps in making the jump from there, fixed on the ground with one foot behind the line of departure. The second trial run, taking into consideration the best. Measurement will be made to the line of departure to the last sign of the sport left in the sand pit.

**3. 10x30m speed running** - consists of 10 jogging on the distance of 30m, with 30 break "from running. Is taken from a standing start and running with maximum speed of each run. It will record all 10 of jogging, making them simple arithmetic averages.

**4. Cooper 12 ' Test** - aerobic or endurance test. Boys run 12 'on the athletics track at the stadium. Measure the distance in meters of each player within 12 '. At the end of regulation time to give an audible signal, using a whistle, athletes are forced to stop and wait to hear this recording meters travelled.

#### **Sets of exercises to improve specific physical fitness:**

##### *I. Exercises for explosive force development of disposal:*

→ Stand with one foot resting on the ground before or with one knee on the mat with a spear in his hand: arch traction before sloping up (partner standing behind you tail spear thrower and resistance against the light).

→ Lying back on the chest, legs fixed, extension arms medicinal body with a ball in his hands:-2kg before throwing in the wall.

→ Down before medicine ball held over his head and back - before throwing up with trunk extension.

→ Stand on one knee or sitting: Medicinal before throwing a partner, bowing trunk.

→ Passing in two with one hand above the shoulder, the distance increases progressively.

→ Throw at the gate by force, the step change.

→ Preparing and imitating the shoulder throw.

→ Passing the ball medicine ball or handball 1kg filled at different distances, the place or easy to travel with an emphasis on throwing practicing procedures.

→ Shot carries heavier than the regular balls.

→ Series of balls shot for wearing different: regular handball, the "oina," handball filled, etc.

##### *II. Exercises for education physical qualities-speed torque force:*

→ Jumping in length with successive starting place in the series.

→ Double Jump: step mattress long jump.

→ Five Jumping easy detachment, five jumps with knees up, five jumps with maximum separation.

→ Five Jumping easy detachment and 10 jumps with a slight shift.

→ Triple jump pent jump, decajump; → successive Jumps place on trampoline elastic maximum separation.

→ Jumping the ball on the spot, with a sand bag on his shoulders.

→ Jumping out of the box.

→ Landing on the ground and crouch jump followed by a length.

→ Jumping on the box on the ground on both legs with one hand reaching for a ball suspended.

→ Successive jumps in place with the ball in his hands on one or both legs.

→ Jumping from one foot to the other, with the ball in his hands.

→ Successive jumping on the spot light or travel light with the ball between the ankles.

→ Step jumped handball ball carrying breast.

→ Step jumped handball before placing the ball high over the shoulder.

→ Jogging, throwing up, they jump high in the air trapping.

→ Successive Jumping in length, catching the ball passed by a partner.

→ Squat jump from bird to catch the ball and handball.

→ Catching and passing the ball bounce on a triangle-shaped space.

→ Passing in two bounce over the volleyball net.

→ Series of the gate throwing or jumping long jump.

→ Disposal gate jump ball filled handball (1kg) of the post intervention.

→ Gate bounce throw: change in momentum during the course of action or double jumps are on the right leg and left.

→ Gate jump shot for various tactical situations (partitions, circulation) when a partner resists loosening, keeping it the way the performer.

### III. Exercises to speed development:

- starts from different positions: bottom, lying back, sitting, lying down in front on, continued to speed jogging distance of 5-15 m repeat 4-8 X with breaks of 60 s,
- layers, preceded by light jumping off place or fundamental position travels, continued with the speed jogging distance of 5-15 m,
- starts up from the attack or defence, continued with the speed jogging distance of 5-10 m and 20-30 m,
- starts 15 to 25 m speed run and collect a ball handball. The exercise will take place in pairs, and the location of the two players who may be opposed to fighting for the ball or the ball towards convergence,
- Movement games, "crabs and shrimp", "race numbers," the third runs,
- Sudden starts in fundamental position to run accelerated: 6-8x10-20 m,
- Add side trips to the steps, left and right, the distance of 5 m between two cones or two signs circle drawn on the goal area, 4-6X30-20 s,
- Accelerated running the distance of 15-20 m, followed by slow jog and again accelerated running 15-20 m,
- Start fundamental position, speed and stop running in 8-10x15-10-5 m,
- Start from different positions, running at speed 5-15 m, stop, back, slow jog: 4-8x,
- Running with change of direction in the marked places,
- Stand in pairs: semi-circles located between the defender reacts by throwing dodge binding of the striker or poultry, 3-5x1 minute,
- Start, interception, dribble and shot multiple gate,
- Sudden starts running speed on the counterattack.

Timing of the throwing action is closely related to the gate made by the opponent, the interception made by teammate, or anticipation is based on the counterattack. → Multiple dribbles straight 4-6x15-25 m multi of direction dribble, dribble through multiple milestones, with multiple pirouettes dribble, dribble changing multi-speed travel.

- Exercise consists of processes of motion in the field: move left and right 3 m 3 m fundamental shifts in position on the arc, 10 to 15 m speed run, stop, running back 5-7 m, quick return, continued to run Easy. Switching from one process to another is made at signal or by markings on the ground. Repeat 4-8 times.

### IV. Exercises to resistance development:

- Players sit in the circle area from 6 m to stand and move right, forward and back: the trips are accompanied by arm movements, specific handball game in defence. It performs three rounds of 10-12 reps, each repetition is 20 s. The interval of 30-40 repetitions and one of the series and 1-2 minutes.
- Exchange of places in third, throwing the gate running, 3x10x30 m lies in the interval between repetitions run easy to where the exercise began, and the between innings will be 2-3 minutes.
- The specific actions outlined above playing defensive players left on the counter add to the circle of 9 m from the front gate effects, 3x10, 10x30 and the interval between repetitions of 30-40 s and 1-2 minutes between halves.
- Move the defense, starting immediately on the counterattack and defensive retreat 3x10x40 and 40 s interval between reps and 1-2 minutes between halves.
- "Moving square": 8, 12, 16 players are willing, at equal distances on the sides of a square, pass the ball to the right or left side, with the relocation of the pair in front or on the opposite corner. Depending on the number of players, the distances between the players and watched for 2 or 4 balls can be inserted: 3-4x8-6x60 s, 45 s rest between reps and 1-2 minutes between halves.
- Double bobbin case, made length field (passing between two players who, after the pair passes the next, and defenders are released and those who pass the ball, then pass the string queue): 2x10x30 m interval between repetitions is a function Pair number between 20 and 40 and between half and one is 3-5 minutes.
- Settlement device attack in two pivots and quick passes between players who sustained trips made using the methods of the movement field: 4-6x8-10x60 s with 30 s intervals between repetitions and 2 minutes between innings.

→ The players, divided into groups of three, fundamental moves in position between the two semi-circles of defense, the counterattack to turn the other gate, collected a ball and made eight three on center court, then throw at the gate and muster, 2-4x4-6x60-70 and takes 2-4 minutes rest between rounds.

→ Counter launched a long pass to the goalkeeper who is the top player in the third attack, 2-3x10-12x30 m, with 4-5 minutes interval between innings, and in between repetitions, the time it takes to recover the ball.

→ "Big eight": the players are seated in the device attack and perform a pivotal movement in the form of eight passes, 5-8x4-40 s, 40 s intervals between repetitions and 2 minutes between innings.

→ Circulation players and passing the ball in a pivotal band: 30 s rapid passing between players, they performed with or without the ball in motion processes of land in the area, assists with 30 and the active movement of the players as players semicircle 9 m from the line acting on their land areas.

→ Passing 10x30 and with active circulation of all nine players at the line center and the inner me, people act on their posts on the semicircle;

→ 10x30 and quick passing.

→ 10x30 and assists with active movement of all players.

→ "Who keep the ball more," in terms of playing man to man defence in a space bounded by the lines of semi-circle of 9 m, 4x3, 8x60-45 s, interval between rounds of 1-2 minutes between reps and s. 30-45

→ Play games with various preparatory tasks: organizing the defence, counterattack, counter-claimed positional attack and movement with passing and movement on the ground in a high rate.

→ Game at a gate: the six defenders have to face attacks supported by two lines of attack that always succeed. Dosage effort is made depending on the degree of preparation.;

→ Game two gates: the attacking team plays against defences placed second on the two semicircles of the land.

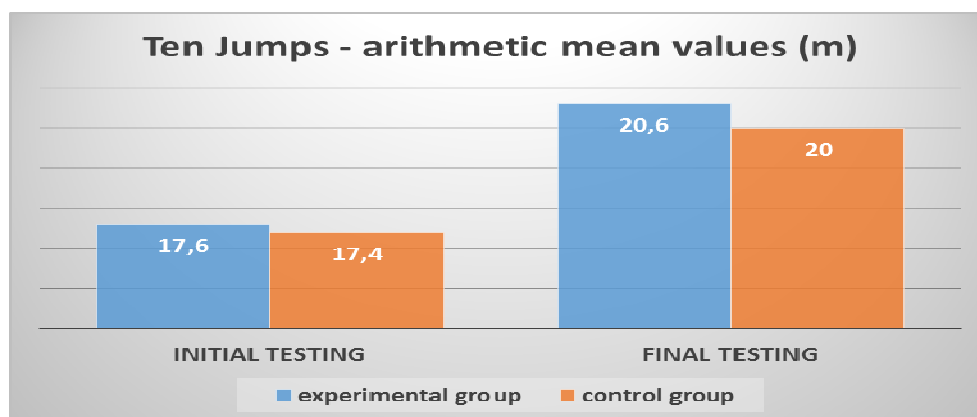
### Results:

Table 1. Values obtained in test scores at throwing the handball (experimental group)

<b>THE TEST OF THROWING THE HANDBALL (<i>experiment group</i>)</b>			
<b>Subjects</b>	<b>Initial testing (m)</b>	<b>Final test (m)</b>	<b>Δ Ft-It (m)</b>
1	35	39	4
2	36	41	5
3	34	40	6
4	35	40	5
5	36	41	5
6	36	41	5
7	34,5	39	4,5
8	34,5	39	4,5
9	34	39	5
10	35	40	5
11	35,5	40	4,5
12	36	41,5	5,5
13	36	42	6
14	34	39,5	4,5
15	35	40,5	5,5
<b>average</b>	<b>35,1</b>	<b>41,16</b>	<b>5</b>

Table 2. Values obtained in test scores at throwing the handball (control group)

<b>THE TEST OF THROWING THE HANDBALL (control group)</b>			
<b>Subjects</b>	<b>Initial testing (m)</b>	<b>Final test (m)</b>	<b>Δ Ft-It (m)</b>
1	34	37	3
2	35	37	2
3	36	38	2
4	36	39	3
5	35	38	3
6	34	37	3
7	35,5	37,5	2
8	36	38,5	2,5
9	35	37,5	2,5
10	35	37	2
11	35,5	37	2,5
12	34,5	37	2,5
13	35	38,5	3,5
14	36	39,5	2,5
15	35	38	3
<b>average</b>	<b>35,16</b>	<b>37,76</b>	<b>2,6</b>



Graphic 1. Arithmetic average values in test scores at ten jumps

Table no. 3 - Arithmetic average values in test scores at running speed 10x30m

<b>Group→ Test time↓</b>	<b>Control group</b>	<b>Experimental group</b>
<b>Initial testing (seconds)</b>	4,97	5
<b>Final testing (seconds)</b>	4,87	4,8
<b>Δ Ft-It (seconds)</b>	<b>0,2</b>	<b>0,1</b>

Table no. 4 - Arithmetic average values in test scores at Cooper 12 ' Test

<b>Group→ Test time↓</b>	<b>Control group</b>	<b>Experimental group</b>
<b>Initial testing (seconds)</b>	2383	2366
<b>Final testing (seconds)</b>	2473	2583
<b>Δ Ft-It (meters)</b>	<b>90</b>	<b>217</b>

**Discussion of results:**

The situation results obtained by testing two groups of subjects participating in the experiment, the control samples, is as follows:

-the samples motility notice a performance increase in all subjects, but those of group experiments these values are higher than the control group.

-the motility test results show that subjects in experimental group that were made specific physical training exercises that were introduced by means of our proposed action, got results superior to those obtained by the control group.

Sample *handball throw* (Table no.1 and no.2) the ball in the experimental group subjects recorded the following values: the initial testing of 35,1 m. and 41,16 m. at the final control group saw the value of the initial testing of 35,16 m, and the 37,76 m. Comparing the final results of the two groups as a result of the difference between initial and final testing was 2.6 m from the control group, compared with 5 experimental group, these results reveal that the means drive used in the experimental group were effective.

*Ten jumps* sample (Graphic 1), the experimental group in which subjects recorded the following values: the initial testing of 17.6 m and 22.6 m at the final control group recorded the initial test value of 17.4 m, and the final 20 m. Comparing the results obtained by the two groups as a result of the difference between initial and final testing was 2.6 m from the control group, compared with 5 m experimental group, these results reveal that the means used to drive experiment group were effective.

Gombos L. and Zamfir G. (2008) include this test in a series of samples required for testing physical training to the children who practice handball. Their study is a large project that aims to revitalize them juvenile handball in Transylvania by establishing training centres. The authors recommend that the test ten jumps to perform twice as assessment test.

*10x30 m flat Running* sample (Table no.3), the experimental group in which subjects recorded the following values: the initial testing of 5 "(seconds), and at the final 4" 8 (seconds). Control group recorded the initial testing of the 4"97, and at the final 4"87. Comparing the results obtained by the two groups as a result of the difference between initial and final test was 0.10 seconds in the control group, compared with 0.20 in the experimental group. All these results reveal that the driving means used in the experiment group have been effective.

*Cooper test*, (Table no.4) the subjects saw the experimental group following values: the initial testing in 2366 m and 2583 m finals at the control group saw the value of initial testing in 2383 m and 2473 m at the final results of comparing the two groups as a result of the difference between initial and final test was 90 m from the control group, compared to 217 m in group experimental, these results reveal that the driving means used in the experiment group were effective.

After more research performed by Popescu F. (2004), it is recommended that use of the Cooper test to work in intermittently to allow a maximum intensity and therefore increase energy capacity.

### **Conclusions**

- ✓ A crucial role in obtaining performance sports development so it has the basic physical quality, as well as those specific involved in the game of handball.
- ✓ Selection exercises systems for the operating model has a key role in the athlete progress more rapidly.
- ✓ Development of speed in all forms of expression involved in the game of handball was achieved through specific, leading to an increase of its values, superior results compared with the control group where the means were also used in athletics, gymnastics and other sports games.
- ✓ Superscript resistance was recorded in the case, as evidenced by the difference between the two tests, which leads me to conclude that: specific driving systems have been chosen handball proved to be optimal for achieving superior performance.
- ✓ Given the superior results obtained in the experimental group, it is necessary regular use of individualized training effort in order to adapt the game strictly on the task, the posts held by each player, thus giving a touch more specific training.
- ✓ Development of specific physical fitness improvement through specific indices determine both the specific physical training, and improving technical and tactical mastery.
- ✓ Dosage effort should be made carefully and in accordance with the physical training, with subjects age given physical possibility and not least in relation to motor and technical-tactical potential of the athlete.



✓ Specific means handball game selected for this experiment were also determined to improve the quality level driving skill and coordination, which shows that exercise systems used were selected on the criterion of efficiency.

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