METHODOLOGICAL BASIS OF INITIAL WATER POLO TRAINING

INTRODUCTION

The array of techniques used by athletes in the modern game of water polo is quite vast. Ball handling techniques are the main mean to implement the intended tactics and are based on the abilities of water polo players to effectively execute special game swimming techniques and to possess high-quality methods of movements that are based on competitive methods of swimming. (KOLOSOV, 2003; BULGAKOVA, 2003 “AKADEMIYA”)

The initial training includes the period of educational work when the trainees new to water polo game, are taught the minimum of knowledge, abilities and skills required to take part in a game as a member of a team aspiring to obtain the 3rd athletic title. (ZAYTSEV, 2006; SMIRNOV, 2006; KOLODOV, KUZNETSOV, 2006)

Such minimum includes the ability to hold on water for a prolonged period of time, front crawl and back crawl, breaststroke kick or side stroke, outleap, water start, ability to stop and change the direction of swimming, picking up ball from the water surface and throwing it forward or sideways, dribbling, and ability to navigate in water during the game. (NIKOLAYEVA, 2012; PLATONOVA, 2012). The goal keeper shall learn to catch the ball and torso. Beyond that, athletes shall master a minimum of primitive tactical techniques. (RYZHAK, 2002)

Accomplishments of the national water polo school in the international field are widely known. (RYZHAK, 2002) Starting from 1952, soviet water polo players have been amongst the leading athletes. Such accomplishments have been made possible as a result of serious and patient work of specialists and athletes at all stages of the water polo training system. (FROLOV, POPOV, 2005; MENKHIN, MENKHIN, 2005) One of the main links in this system is the initial training of young water polo players, when the foundation of the future skills is shaped. (EMELIN, 2008)

METHODOLOGICAL FRAMEWORK

Terms and definitions

Method – is a set of techniques and means of research, procedure for their application and interpretation of the acquired results. It depends on the nature of the object of the research, methodology, goal of the research, developed approaches and general experience of the researcher.

Technique – is a system of rational movements similar in structure and aimed at resolution of homogeneous tasks.

Water polo – is a sports team game played in a pool with a ball, in which the players try to get the ball into the other team’s goal by means of individual and collective actions.

Ball handling means catching, passing, dribbling and throwing the ball.
Set of exercises - is a sequence of several exercises with a certain amount of sets, repetitions, pauses, which are performed at a certain frequency. (LOGINOV, BAYEV, ALOKIN, 2013)

**Goal of the research**

Before we began, we set a goal of establishing a structure of ball handling training by identifying the sequence of learning specific techniques. Having selected the topic, we assumed that vast experience of specialists, which is the foundation of the initial training process in water polo, still remains insufficiently studied and has not been properly covered in the existing scientific literature.

The following specific tasks were set:
1. Analyze modern method of initial ball handling training in water polo;
2. Identify the sequence of learning specific techniques;
3. Identify a general structure of mastering ball handling techniques;
4. Select and arrange sets of ball handling training exercises used by water polo players.

**METHODS OF RESEARCH**

To resolve the abovementioned tasks, the following methods were used:
1. Study and analysis of literature sources;
2. Questionnaire survey;
3. Generalization of practical materials and experience of coaches;
4. Interviews.

**Arrangement of the research**

Generalization of field experience of coaches in initial ball handling training, and analysis of literature sources covering these issues were our main methods of work. To gather information on specialists’ opinion on the issue under research, a questionnaire survey was held.

The goal of the first questionnaire was to identify the most optimal training sequence, as well as techniques that cause the most difficulties for trainees, and techniques that require compulsory lead-up exercises.

In the second questionnaire the specialists were offered to specify the most optimal timing for starting specific techniques training.

Both questionnaires can be found below. Totally, 60 specialists filled out the questionnaires (24 specialists filled out questionnaire #1, and 36 specialists filled out questionnaire #2). The average coaching experience was 15 years.

The sets of exercises were selected based on methodological literature research results, interviews with the specialists and personal coaching experience.

When answering the first question of the given questionnaire, the interviewed specialists were unanimous in the opinion that the most optimal sequence in ball handling techniques training system is the one when the sets of initial training exercises (swing shots, push shots and drawing of the ball) are given consequently. All of the interviewed specialists highlighted this option out of the two. No other options were proposed.

The goal of the second question was to identify specific techniques that require lead-up exercises for mastering. All of the interviewed specialists consider that lead-up exercises are required to master picking the ball up from the water surface. The majority of the respondents (95.7%) consider that lead-up exercises are required to master catching the ball, dribbling and moving with the ball (74.1% each). 18 (66.6%) and 17 (63.3%) specialists, respectively, point to the need for lead-up exercises for mastering carrying and tackling the ball.

When training to master a group of swing shots, a unanimous opinion was expressed on the necessity to use lead-up exercises for mastering the backward shot. The majority of the interviewed also considered it compulsory to use lead-up exercises for mastering basic shot and shot from the back (23 specialists voted for each). 18 and 17 specialists, respectively, supported the need to use lead-up exercises to master hand shot and shot with a stretched-
out arm. For push shots it is required to use lead-up exercises as well (knuckle ball shot - 95.7%, basic push - 91.2%).

During punch shots training, lead up exercises are required to master hand drawing (100%), and forearm drawing (91.2%). 17 specialists pointed out the necessity to use lead-up exercises during mastering ball kicks. Judging by the acquired data, the most difficulties are caused for the trainees during training shots from back, knuckle ball shot, drawing and backward shot (23), basic push (18), shot with stretched out arm (15), and basic shot (12).

Having analyzed the data obtained as a result of examining the responses of specialists to questions of Questionnaire #2, the following conclusions can be made. Most of the specialists believe that 5 out of 6 initial techniques should be mastered during the first year of training (lifting the ball - 100%, tackling - 91.6%, catching - 86.1%, carrying - 58.4%, moving with the ball in one hand - 52.7%). The opinions on dribbling only have divided. The majority of the specialists (58.4%) believe that it is most optimal to start dribbling training during the 2nd year. Three techniques of swing shots out of 5 in this group shall be mastered during the 2nd year of training (basic shot - 77.7%, stretched out arm shot - 55.5%, hand shots - 58.4%). In most cases (52.7%) the specialists believe it to be expedient to start mastering shots performed from the back during the third year of training. In regard to the backward throw, the opinions have divided equally between the 2nd and the 3rd years of training. The third year of training is the most optimal year to master push shots (knuckle ball shot - 55.5%, basic push - 52.7%), although some specialists believe it to be possible to start mastering these techniques during the 2nd or 4th years of training. It is better to start mastering drawing the ball during the 4th year of training (hand drawing - 55.5%, forearm drawing - 69.4%). In regard to ball punches, the opinions have divided: most of the specialists (41.6%) believe that the initial training should take place during the 3rd year.

RESULTS

The selection of specific exercises aimed at mastering ball handling techniques is based on several factors. One of the most important ones is the level of difficulty of the motor action of the specific technique. (PLATONOV, 2004; KARPOV, ZVORYKIN, LYASHENKO, 2015) The existing method require application of various groups of exercises aimed at efficient mastering of the studied technique, as well as ways of performing actions with the ball.

This method is based on distribution of all exercises according to the conditions of their performance. By using general pedagogical didactic approaches, the training process for each technique requires performing a set of specific exercises first on the ground (lead-up exercises) and then - in the water with gradual introduction of competitive conditions. (NIKITUSHKIN, V., 2010; MARIYIN, I., 2019) Thus, the training process presents a set of methodological techniques and specific exercises with step-by-step increase in requirements with approaching the appropriate structure of the mastered motor action. There are 12 such steps depending on the conditions of the exercise.

Chart 1. Step-by-step system for selection of exercises for initial ball handling techniques training

| Step of the training | Conditions of performing exercises for the initial training |
|----------------------|----------------------------------------------------------|
| 1                    | Exercises performed on the ground without the ball (simulation) with no movements |
| 2                    | Exercises performed on the ground without the ball (simulation) in motion |
| 3                    | Exercises performed on the ground standing still |
| 4                    | Exercises performed on the ground in motion |
| 5                    | Exercises performed in shallow water without the ball (simulation) standing still |
| 6                    | Exercises performed in shallow water without the ball (simulation) in motion |
| 7                    | Exercises performed in shallow water with the ball, standing still |
| 8                    | Exercises performed in shallow water with the ball in motion |
| 9                    | Exercises performed in water without the ball, threading water |
| 10                   | Exercises performed in water without the ball in motion |
| 11                   | Exercises performed in water with the ball, threading water |
| 12                   | Exercises performed in water in motion |

Source: Search data.
Based on the proposed pattern, each step corresponds to certain conditions of performing training exercises, while the steps are arranged in a way of approaching the model of trained action.

In the chart 1 above, the conditions of performing training exercises, corresponding to the 12th step, are the closest to the structure of the trained action.

Such approach to selecting the means (exercises) of training allows the coach to be creative in selecting the required exercises, by considering variety of factors, such as: complexity of a particular technique, trainee’s fitness level, etc. On the other hand, determination of complexity level of a particular technique (during an experiment) and the corresponding initial step during the training process can allow to determine the fitness level of a trainee and the most optimal scheme of initial training of specific ball handling techniques. (MARIYIN, STEPANOVA, 2016).

DISCUSSIONS
It is commonly known, there are three stages of training a particular motor action to the level of a full-fledged skill. The first stage is initial exercising to form an ability to replay the action in a general form. Second stage is exercising the technique in more details to gradually transform the ability into a skill. The third stage is perfecting the ability into a firm skill. (SMIRNOVA, KRASIKOVA, 2018; XHENLOKOVA, AGAYEV, TYUMASEVA, 2018) One of the main reasons why those involved in sports schools in water polo do not develop a firm skill is, in our opinion, the lack of proper time and training means at one stage or another of training. The second reason may be non-optimal training sessions during detailed exercising of a technique. (NIKITUSHKIN, 2010) As practice shows, the most common form of training session is a complex session, when the initial exercising is preceded by swimming training. Therefore, the development of new complex coordination movements of the ball handling technique occurs against the background of a certain physical and sensory fatigue. (KOSTOLL, 2008) It is necessary to take into the account the training experience of complex coordination sports, where training of new actions occurs after a specific warm-up against the background of physical and mental freshness. (BULGAKOVA, 2003) The third reason may be non-observance of physiologically determined general practices of training, such as, gradual complication of a technique. This leads to the wrong choice of training methods at the stage of initial exercising. (BEZRUKIKH, 2009) Most of the ball handling techniques in water polo represent a complex coordination action that include swimming skills and abilities. Therefore, it seems natural, when mastering these motor actions, to train element by element and use lead-up exercises. In practice, whole or wholly separate methods are often used. (KASHKIN, 2005; FROLOV, 2007).

CONCLUSION
1. In the existing scientific and methodological literature on water polo, there is an apparent deficit of works covering the issues of ball handling initial training, and a lack of methodological developments with a set of specific exercises.
2. We have revealed the sequence for mastering water polo techniques and optimal approximate timing to start learning specific ball handling techniques.
3. We have revealed special aspect of organizing a training process for ball handling in water polo.
4. The most optimal system of organizing a training process of ball handling is the one, when the groups of initial techniques, swing shots, push shots and drawing of the ball are mastered consequently.
5. Techniques that require lead-up exercises, as well as techniques that cause the most difficulties during training have also been revealed.
6. The selected and systematized sets of exercises are aimed at mastering techniques in all aspects of ball handling in water polo.
RECOMMENDATIONS
The materials of this article may be found useful by the students of physical education departments, water polo coaches, as well as by teachers of extended educational system.

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Methodological basis of initial water polo training

Base metodológica do treinamento inicial do polo aquático

Bases metodológicas de la formación inicial de waterpolo

Resumo

A relevância do problema pesquisado é determinada pelo fato de que até o momento não existe uma literatura que aborde de forma bastante completa as questões do treinamento inicial de técnicas específicas. Ao mesmo tempo, o crescimento ativo da popularidade do polo aquático feminino gerou a necessidade de envolver as atletas praticantes no treinamento. Nessa situação, a falta da literatura metodológica necessária sobre o treinamento inicial torna-se ainda mais essencial. Metodologia - o objetivo deste artigo é determinar a estrutura do processo de treinamento do manuseio da bola por meio da identificação da sequência de aprendizagem de técnicas específicas. O trabalho inclui levantamentos, análises e síntese, bem como método de estudo empírico - um experimento. Resultados - este trabalho apresenta um conjunto especial de exercícios voltados ao treinamento de técnicas iniciais de manuseio de bola no polo aquático. Significado - os materiais deste artigo podem ser considerados úteis por alunos de departamentos de educação física, treinadores de polo aquático, bem como por professores de sistemas educacionais ampliados.

Keywords: Methodology. Technique. Water polo. Ball handling. Set of exercises.

Abstract

The relevance of the problem under research is determined by the fact that so far there is no literature that would in a fairly complete manner cover the issues of initial training of specific techniques. At the same time, active growth of popularity of women’s water polo has entailed the need to engage practicing female athletes into coaching. In this situation the lack of the required methodological literature on initial training becomes even more essential. Methodology - the purpose of this article is to determine the structure of ball handling training process through identifying the sequence of learning specific techniques. The work includes surveys, analysis and synthesis, as well as empirical study method – an experiment. Findings - this work present a special set of exercises aimed at training of initial ball handling techniques in water polo. Significance - the materials of this article may be found useful by the students of physical education departments, water polo coaches, as well as by teachers of extended educational system.

Keywords: Methodology. Technique. Water polo. Ball handling. Set of exercises.

Resumen

La relevancia del problema bajo investigación está determinada por el hecho de que hasta el momento no existe literatura que cubra de manera bastante completa los temas del entrenamiento inicial de técnicas específicas. Al mismo tiempo, el crecimiento activo de la popularidad del waterpolo femenino ha implicado la necesidad de involucrar a las atletas en ejercicio en el entrenamiento. En esta situación, la falta de la literatura metodológica requerida sobre la formación inicial se vuelve aún más esencial. Metodología: el propósito de este artículo es determinar la estructura del proceso de entrenamiento del manejo del balón mediante la identificación de la secuencia de aprendizaje de técnicas específicas. El trabajo incluye encuestas, análisis y síntese, así como un método de estudio empírico: un experimento. Hallazgos: este trabajo presenta un conjunto especial de ejercicios destinados al entrenamiento de las técnicas iniciales de manejo del balón en el waterpolo. Importancia: los materiales de este artículo pueden resultar útiles para los estudiantes de los departamentos de educación física, los entrenadores de waterpolo y los profesores del sistema educativo extendido.

Palabras clave: Metodología. Técnica. Waterpolo. Manejo de pelota. Conjunto de ejercicios.
APPENDICES

QUESTIONNAIRE #1

Full name

Coaching experience

1. To your opinion, what is the most optimal sequence in ball handling techniques training?
   a) Initial techniques - swing shots, push shots, drawing of the ball;
   b) Initial techniques - parallel mastering of swing shots, push shots and drawing the ball;
   c) Other options

2. To your opinion, which ball handling techniques require lead-up exercises during the initial training? (Underline as necessary)

   Initial ball handling techniques:
   a) Lifting the ball
   b) Ball tackling
   c) Catching the ball
   d) Carrying the ball
   e) Dribbling
   f) Moving with the ball in one hand

   Swing shots:
   a) Basic shot
   b) Backward shot
   c) Stretched out arm shot
   d) Shots from back
   e) Hand shot

   Push shots:
   1) Knuckle ball shot
   2) Basic push

   Shots and punches:
   a) Drawing by hands
   b) Drawing by forearm
   c) Ball punches

3. Which ball handling techniques cause the most difficulties for the trainees during training?
Questionnaire #2
Please, name the most optimal to your opinion timing to begin training (the year of training at Children’s and Youth Sports School) of given below specific techniques, tactics and combinations at various stages of water polo players training at Children’s and Youth Sports School and Specialized Children and Youth Sports School of the Olympic Reserve.

| Age of the groups | Initial training group | Training group | Sports perfection group |
|-------------------|------------------------|----------------|-------------------------|
| Year of training and age | 10-12 | 11-13 | 12-14 | 13-15 | 14-16 | 15-17 | 16 & older | 17 & older | 18 & older |

Source: Search data.

Ball handling techniques
Initial techniques for ball handling:
1) Lifting the ball,
2) Tackling the ball,
3) Catching the ball,
4) Carrying the ball,
5) Dribbling,
6) Moving with ball in one hand.

Ball throwing techniques
Swing shots:
1) Basic shot
2) Backward shot (back shot)
3) Stretched out arm shot (lateral shot)
4) Shots from back
5) Hand shot

Push shots:
1) Knuckle ball shot
2) Basic push

Shots and punches:
1) Drawing by hands
2) Drawing by forearm
3) Ball punches.