The Effect of Functional Exercises in Some Biomotor Abilities and Metabolism Rate for Volleyball Young Players

Mahmoud Nasser Radhi [1], Sawsan Hadood Obaid[2]

[1] Lecturer, Faculty of Physical Education and Sports Sciences / University of Kufa,
[2]Prof. Dr., Faculty of Physical Education and Sports Sciences/ University of Babylon

Abstract

The importance of the research is preparation functional exercises scientifically, researchers believe that it affects in some biomotor abilities and metabolism rate, which is directly involved in the defensive and offensive performance of Volleyball for young players. Through the experience of field researchers note there is a noticeable decrease in the performance of defensive skills in matches where the level of technical performance is very high or the game continues for longer periods of time, this decrease leads to a slow moving to take the right place while performing these skills, researchers believe that the reason for this is that these skills are not getting enough share from training in a way that suits the nature of its physical and physiological performance , So the researchers felt that they should go into this experiment by preparing functional exercises, the aim of this exercises is to make a positive impact in some biomotor abilities and metabolism rate for Volleyball young players . As for the research methodology and its field procedures, researchers used the experimental method to solve the problem of research, the research society was determined by the Kufa Club Volleyball for youth, for the sports season 2019-2020

Keywords: *Functional exercises, biomotor abilities, metabolism rate*

Introduction

There is no doubt that scientific research has become one of the most important necessities in our modern society in reaching the highest [1] levels for all aspects of life by identifying the different energies and capabilities of human to try to achieve most benefit from scientific theories and their application to serve and develop the society, including the sports field [2], it may need a lot from sporting events to great time to get to high level of capabilities and possibilities . One of the games that have become a lot of attention in recent times is the game of Volleyball, which is one of the most popular games in the world, Volleyball requires a great muscle ability to perform its skills, upon closer examination In the nature of performance we find that it requires high energy to perform the motor duty with force [3], speed and endurance, it requires from players when performing the skills, high abilities. The defensive performance in playing Volleyball requires a high level of physical and skill performance consistently, the cases of defending the stadium and its various forms, as well as the skill of the blocking wall it has difficulty by skillful fast and sudden performance, therefore, it is important that biocompatibility and skill performance serve one another to achieve the goal, the player's susceptibility level can be found through these variables [4].

Methodology

Search community and the sample:

The research community was determined by the youth Kufa sports club for the sports season (2019-2020) and the number (12) players was chosen by the researcher in full for the experiment, they were distributed equally to two groups in a random way (lottery), after that, the experimental group underwent training that included the use of functional exercises, while the control group continued to use the regular training curriculum for the coach.

Devices and tools: Medical scale - tape measure - A wall with a tape measure installed- chalk.

Description of performance : After weighing, the player raises the distinct arm over its entire stretch to make a finger mark on the wall, or the blackboard with

heels not raised from the ground, and records the number that the sign is placed in front of.

- When the laboratory is ready on the starting line, sprints with accelerated acceleration to finish the distance to the place of advancement in only three steps, Upon reaching the place of rise, he performs the double vertical jumping to the highest possible height to mark the point of arrival with the fingers dipped in the chalk powder, The laboratory is awarded two best scores and the wrong one is repeated.

$$\frac{\text{MASS} \times \text{Jumping height} \times 9.8}{\sqrt{\frac{\text{Jumping height} \times 2}{9.8}}}$$

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Recording: The weight and jump height data for each laboratory are recorded and processed using the following formula, given that the weight is in newtons, The player's mass can be used in kilograms, multiplying the numerator of equation x 9.8 .

Power =

Second: test the three steps long jump :

· **Purpose of the test:** Measuring the force marked by the muscles of the legs.

· **Devices and tools:** A distance not less than (9 m) the width of the volleyball court and a tape measure.

· **Description of performance:** The laboratory stands behind the starting line and then Jumping forward by feet together for three long steps consecutive, each laboratory is given two attempts to calculate its best.

· **Recording:** Distance is measured from the starting point to the last footprints, after the third jump (the three steps jump distance).

Third: Running test Shuttle of different dimensions (9-3 - 6-3-9) meters:

· **Purpose of the test:** Measuring agility.

· **Devices and tools:** Volleyball court, stopwatch, funnel number (6).

Description of performance: The laboratory is behind the starting line of the stadium upon hearing the starting signal, he runs in a straight direction to touch the funnel above the middle line 9 m by the right hand then he turns to run towards the 3m line it found in the middle of the field, that he started running to touches the funnel above the line with the right hand 3 m , then turn towards the 3m line , located in the second half of the stadium to touch the funnel above the 6m line with the right hand to go to the middle line 3m to touch the funnel above the 3m line with the right hand, then turn to run toward the 9 pm finish line to cross it with both feet, here it should be noted that touching the lines every time with the right hand, must be crossed the finish line with both feet..

Recording: the time records from start to finish over the finish line as shown in figure (3).

Measuring the metabolic rate during physical effort:

Metabolic rate is measured during the physical effort, accurately through the use of the (Fitmat pro) as the player's data (name, length, mass, and age) are entered before starting the measurement, also, clean the test mask by antiseptic, and connect the parts of the system with installing the heart rate belt on the chest and installing the signal receiver for the heart rate (Bluetooth) in the port assigned to the device, then (Wingate) test is performed on physical effort bicycle type (MONARK), where the mask for measuring (VO_2max) is placed on the player's face, after completing all the requirements for working the devices and after completing entering the required data into the device as well as the program for the physical effort bicycle, the test is started according to the conditions [5] of the (Wingate) test, after completing the test, data will be recorded for the maximum oxygen consumption rate (VO2max) from the (Fitmat pro) software, choose the (recovery option) from (Fitmat pro) device with the mask remaining on the player's face until O2 consumption is reached, the rest time following the physical exertion, with the same mechanism, the test is performed twice, the metabolic rate during the physical effort is measured (energy expenditure during exercise) through the (Fitmat pro) device screen, the metabolic rate during the physical effort is extracted according to the equation below:

Metabolic rate during physical effort in kilocalories per minute=

Equivalent metabolism × 3.5×mass /200

Note: the (Fitmat pro) device during the voltage

gives a reading of (vo2max) in units of milliliter / kg / minute.

Procedures (Wingate) test:

The necessary tools: Stopwatch, calculator, physical effort bicycle type (MONARK).

Style of performance: The test is performed using the stationary bicycle (MONARK) Swedish made, according to the following steps:

ü The examined mass is taken To the nearest correct Kilogram.

ü The data of the examiner is entered into the computer and the resistance is set according to the mass of the examiner, which is equivalent to 7.5% of his body mass.

ü The examiner performs a warm-up operation on the bike for a period of (3-4) minutes where the resistance is gradually placed according to the mass of the examiner before the end of the warm-up process, the examiner moves the bicycle wheel at full speed for a period of (3-5 seconds) and repeats this two to three times.

ü Lift the weight from the ballast basket, the examiner starts moving the bicycle wheel at the fastest possible speed with a speed of no less than (80) cycles for a period not exceeding three seconds then the weight is lowered gently and at the same time the program start button is pressed to begin the measurement process the examiner continues to move the wheel for a period of (30) seconds, to be encouraged and urged to maintain the speed of rotation as possible.

Main Experiment Procedures:

Pre-tests:

The researchers carried out the pre-test tests on the research community of the two groups (control and experimental) of the study variables (biomotor abilities test and metabolic rate during physical effort test) on Sunday (16/12/2019), the tests were in the following sequence:

1- Biomotor abilities test :

2- The metabolic rate during physical effort test:

Preparing and carrying out Functional exercises:

The researchers prepared and organized the functional exercises depending on the personal experience of the researchers, it was applied to the experimental group on 22/12/2019 until 13/2/2020 , taking into account (intensity, repetitions, appropriate rest periods) the researchers codified the exercises on a scientific basis, as well as the physical and functional susceptibility of the research sample, the tools used and the method of training, to be these exercises able to develop biomotor abilities, and metabolic rate during physical effort, to achieve the goals and objectives of the training process.

The details of the functional exercises in the training curriculum were as follows:

· The total number of training units that included the functional exercises are (24) unit , and the number of weekly training units that applied functional exercises are (3) units for a period of (8) weeks.

· Time for functional exercises in one training unit are (30-35) minutes

· The target of functional exercises is to develop biomotor abilities and metabolic rate during physical effort for Volleyball young players.

· Considerations exchange working between muscle groups.

· Planning the formations of functional exercises during the weekly and daily units are (1-2).

Post-tests:

The researchers, with the assistance of the assistant staff, carried out the posttests of the research community after the completion of the functional exercise, this was on Wednesday (19/2/2020) and in the same sequence of pretest tests. The researchers took the same conditions as the pre-tests where sequence tests.

Results

Table (1): Shows the mean, standard deviations, the calculated value of (t) of the interrelated samples, the level of the significance of the test and the significance of the difference for the pre-test and post-tests of the

control group of the studying variables.

Variables	Measuring unit	Pre-test		Post-test		(t) value	Level of significance	Type of significance
		Mean	STD.EV.	Mean	STD.EV.			
Explosive power for legs muscles	watts	1308.031	37.804	1379.608	33.684	3.752	0.013	Sig.
Distinguished force with speed for legs muscles	meter	7.533	0.498	8.021	0.35	7.056	0.001	Sig.
Agility	second	11.625	0.282	10.88	0.348	5.348	0.003	Sig
Metabolic rate during physical effort	Kilogram / calories	10.31	1.134	11.588	0.646	4.252	0.008	No Sig

View The results of the pretests and posttests of the experimental group of the studying variables:

Table (2) : Shows the mean, the standard deviations, the calculated value of (t) of the interrelated samples, the level of the significance of the test and the significance of the difference for the pretest and posttests for the experimental group of studying variables

Variables	Measuring unit	Pre-test		Post-test		(t) value	Level of significance	Type of significance
		Mean	STD.EV.	Mean	STD.EV.			
Explosive power for legs muscles	watts	1311.511	30.735	1472.207	21.904	13.137	0.000	Sig.
Distinguished force with speed for legs muscles	meter	7.575	0.209	8.586	0.121	14.912	0.000	Sig.
Agility	second	11.543	0.302	10.11	0.152	9.17	0.000	Sig
Metabolic rate during physical effort	Kilogram / calories	10.298	1.305	13.483	0.799	6.895	0.001	Sig

- View the results of tests (post-test) of the two groups control and experimental studying variables

Table (3) :Shows the value of (t) calculated for independent samples and the level of the test and were significant differences between the results of the test (post-test) of the two groups control and experimental studying variables .

Variables	Measuring unit	control		experimental		(t) value	Level of significance	Type of significance
		Mean	STD.EV.	Mean	STD.EV.			
Explosive power for legs muscles	watts	1379.608	33.684	1472.206	21.904	5.645	0.000	Sig.
Distinguished force with speed for legs muscles	meter	8.021	0.35	8.586	0.221	7.137	0.000	Sig.
Agility	second	10.880	0.348	10.11	0.152	4.960	0.001	Sig
Metabolic rate during physical effort	Kilogram / calories	11.588	0.646	13.483	0.799	5.068	0.000	Sig

Discussion of the Results

The results presented in tables (1) and (2) for biomotor abilities tests there are significant differences between pre-tests and post-tests favor post-tests of the control and experimental groups, the researchers attribute the reason for this significant difference for members of the control group, due to the exercises that were applied by methods prepared by the coach in his training units, as it caused the development of those abilities, which is one of the most important pillars volleyball game, which enables the player to perform offensive and defensive skills well, which led to significant difference and in favor of post-tests, as for the significant differences that appeared in the tables above for these abilities, in addition to Metabolic rate during physical effort of volleyball for the members of the experimental group, the researchers attribute it as a result of using functional exercises, the philosophy and nature of functional exercises is the use of movements within the three directions and flat surfaces of the movement (lateral or sagittal direction , forward direction, transverse direction), which is the nature of all movements of the human body in life and sports in general and the skills of volleyball in particular in working on these three surfaces, thus work collectively as for the muscles of the body during functional exercises [6] and with high compatibility between them, this reflects on the increase and development of muscular strength as a basis for biomotor abilities, this is what was found in the functional exercises designed and applied by researchers to the members of the experimental group, as it is the functional exercises that "coordinate the work of the muscles together to produce perfect energy for motor action, it is the fastest and most powerful way to get muscle development and its abilities at all levels [7].

As for the results presented in table (3), which show the preference of differences in favor of the experimental group, in post-tests, the researcher believes that the exercises that the researcher prepared for the members of the experimental group which is characterized by high intensity helped to develop the explosive power and the distinctive speed of the muscles of the legs as well as agility in addition to the metabolic rate during

the physical effort of the experimental group during the physical effort , as volleyball players need, during the performance of [8-10] different motor skills, rapid and frequent muscle contractions Serving specialty activity.

Conclusions

Based on the research results reached within the limits of the research community, the following conclusions have been reached:

1- The duration of the independent variable represented by the number of training units, it was appropriate to create adaptations that reflect the evolution of the experimental research group for biomotor abilities of physical abilities (explosive power, the force marked with velocity).

2- Functional exercises contributed to the development of biomotor abilities and the physical abilities which are (agility).

3- The evolution of the biomotor abilities reflected positively on the development of metabolic rate during physical effort of volleyball for the experimental research group.

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Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the University of Kufa and all experiments were carried out in accordance with approved guidelines.

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