



ISSN Print: 2664-7281  
ISSN Online: 2664-729X  
Impact Factor: RJIF 8  
IJSEPE 2023; 5(2): 117-122  
[www.sportsjournals.net](http://www.sportsjournals.net)  
Received: 11-09-2023  
Accepted: 13-10-2023

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## The effect of some vacuum exercises and biomotor abilities to development of physical fitness of basketball among the players of Baghdad Education Al-Karkh third team

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**DOI:** <https://doi.org/10.33545/26647281.2023.v5.i2b.62>

### Abstract

The basketball game is one of the activities of the group games, which have been dealt with by many studies and researches to obtain the best achievement. The importance of the research lies in how to introduce vacuum exercises and develop biokinetic abilities and capacities by means of modern scientific training. The current research aims to identify the relationship between some vacuum exercises and biokinetic capabilities with the ability to develop various elements of physical and skillful fitness such as deception and overtaking the opponent player, since most of the research is looking specifically for a specific physical ability or skill only without paying attention to motor performance in general in terms of continuing to maintain outstanding good performance and stamina throughout the match. Thus, this research imposed a statistically significant correlation between vacuum exercises and biokinetic abilities in terms of the possibility of developing elements of physical fitness that may not be at a good level for this sample in particular, and the possibility of endurance and maintaining the level of performance throughout the match period in the game of basketball at a good level. The researchers used the experimental method. As for the research sample, the Baghdad Al-Karkh breeding team / 3 basketball players were (12) players, and the researchers conducted tests for some biokinetic abilities and vacuum exercises, and the researchers used the program (spss) to treat the statistical data. The researchers concluded that there are correlations between some vacuum exercises and biokinetic abilities, and between the physical fitness of female basketball players. Vacuum exercises have a significant impact on basketball players in terms of increasing the lung capacity and strengthening the abdominal muscles. Biomotor abilities have a positive effect on the level of performance. The researchers recommend the necessity of applying these tests in studying the relationship with another type and with other age groups.

**Keywords:** Baghdad Education, vacuum exercises, biomotor abilities.

### 1. Introduction

The game of basketball is one of the important and socially desirable collective activities that have been dealt with by many studies and researches to obtain the best achievement, as the performance of abilities and physical capabilities constitute the cornerstone to developing motor skills for sports activity and reaching the highest level of sports achievement, and this activity depends on a lot of requirements and capabilities and special biomotor abilities when performing, including speed, strength, agility, flexibility, compatibility, balance, and others. In addition to the use of the best and best technique and performance to obtain an excellent level of practice of this event, as well as the introduction of vacuum exercises that help to develop the endurance of the player and increase the pulmonary capacity and strengthen the abdominal and dorsal muscles. Physical and motor, and that any achievement or athletic level is achieved only with the optimal presence of such components and according to the amount of contribution that follows the specificity of the sport. Thus, the level of performance of the players can be advanced in a distinguished and professional manner. Therefore, the researchers decided to delve into the study of the relationship between vacuum exercises and some biokinetic abilities or capabilities and their impact on the level of physical fitness and thus the accuracy of performance of basketball players within the third Baghdad-Karkh breeding teams.

**1.2 Research problem**

The scientific development taking place in the field of training science led to the need for research and experimentation in modern and diverse training methods. Therefore, the researcher, being one of those interested in practicing this sport that is popular with the majority of the public, paid attention to developing the stages of performance and what this event requires from the use of vacuum exercises and biokinetic capabilities in developing the stages of capabilities. And physical capabilities such as speed and endurance of special speed and endurance of speed for this effectiveness, which prompted the researchers to use this new method as resistances to develop physical capabilities and motor capabilities of the research sample and to achieve outstanding motor performance during the game during the games and in all its four periods while maintaining these physical capabilities throughout the playing period without Decrease in the level of performance.

**1.3 Research objectives**

**The research aims to identify the following:**

- Identifying some vacuum exercises, biomotor abilities or capabilities, and physical fitness for basketball players in developing the elements of physical fitness.
- To identify the effect of some vacuum exercises, biokinetic abilities or abilities, and physical fitness of basketball players in developing the elements of physical fitness.
- Finding a correlation between vacuum exercises, bio-

**Table 1:** shows the homogeneity and equivalence between the control and experimental groups in terms of (Length, Mass, training age, and the tests used).

Variables	Control group		Experimental group		T Values calculated
	Mean	Std. Deviation	Mean	Std. Deviation	
Length	155.43	3.76	158.73	4.12	0.331
Mass	41.75	2.85	42.83	1.73	1.79
Training age	2	0.65	3	0.50	1.19
Age	15	2.13	14	2.98	1.13
Shuttle run test (25 m x 8) from the high start	52.13	6.36	50.11	6.53	0.98
The explosive power of the arms	375.11	20.12	390.13	22.14	1.33
The explosive power of the legs	1.10	0.45	1.55	0.43	0.98
The distinctive strength of the speed of the legs	3.32	0.55	3.68	0.86	1.11
Moving running between barriers	40.17	5.12	41.11	7.13	1.55
Quick shooting test on the two baskets 6 times	64.36	10.88	59.77	12.11	1.13
Dribbling test between four barriers for (45) seconds	15	1,13	16	1.73	0.98

**2.3 The means of collecting information, tools and devices used in the research**

**2.3.1 Means of collecting information**

The researchers used many scientific methods to obtain the most important data, including:

Studies, research, observation, experimentation, specialized experts, information network, measurement test, Arabic and foreign sources and references.

**Tools and equipment used**

Two (2) stopwatch chalks, electronic calculator, whistle, tape measure, 3 kg medicine balls, medical scale for measuring weight, registration forms, running track, HP laptop calculator.

**2.4 Exploratory experience**

The reconnaissance experiment was conducted on two players on 6/3/2023, and its purpose is to ensure the validity

kinetic abilities, and the level of physical fitness of female basketball players.

**1.4 Research fields**

**Human field:** The players of the Baghdad Al-Karkh breeding team /3 basketball players.

**Time field:** Academic year 2022-2023.

**Spatial field:** Training rooms for education.

**2. Research methodology and field procedures**

**2.1 Research Methodology**

Choosing the appropriate approach to research the problem provides a lot of appropriate steps for the research, and the researchers used the experimental approach due to its suitability to the nature of this research.

**2.2 Community and sample research**

The researchers adopted the experimental approach to suit the nature of the problem in this research, and the research community was selected from the players of the Baghdad Al-Karkh / 3 breeding team, whose number is (12) players, with an age of (14-16), who are regulars in training effectively in the game of basketball. (100%) of the research community. Homogenization has been carried out for the variables affecting the research. The sample is the group that is examined or studied and on which the research is carried out. It may be a person, two people, or a group (3:83), as the researchers conducted homogeneity and equivalence for the sample, as is shown in Table No (1).

of the tools and the ease and how to be able to prepare and implement the tests smoothly, as well as knowing the time spent in performing the tests and observing the extent of the testers' response to performing the test and the suitability of the staff of the assistant team.

**2.5 Field procedures**

**2.5.1 Biomotor tests**

**First: Speed test**

**Test Name:** Shuttle Run Test (25m x 8) from the high start (Fakarata Toma, 2008, p.87) [1].

**The purpose of the test:** To Measuring the speed tolerance of the muscles of the legs.

**Tools used:** Tape measure - Adhesive tape - Stop watch - Flat yard longer than 30m - Whistle.

**Description of the test:** Two parallel lines are drawn, the distance between them is (25) m. The tester stands at the starting line, and at the start signal, he runs at full speed towards the second line, touches it with his foot, then turns to return to the starting line. This performance is repeated (8) times, so that the distance traveled becomes (25 m x 8) = 200 metres.

**Test instructions:** The tester gives two attempts and calculates the time for the best attempt.

**Register:** The tester records the time it took to cover the distance in seconds and parts thereof.

## Second

### Arms explosive strength test

**Name of the test:** (Ali Somoum Al-Fartousi & Sadiq Jaafar Al-Husseini, p. 231) [2]: From sitting on a chair, throwing a medicine ball weighing 3 kg with both hands over the modified head.

**Test tools:** A flat area, a small rope, medical balls weighing 3 kg each, chairs, an appropriate number of signs, signs or flags, and a measuring tape.

**Description of the performance:** The throwing place is planned with parallel lines, and the distance between one line and another is 5 cm, or the measuring tape is fixed on the starting line from zero degrees to a few meters towards the throwing area.

The laboratory sits on the chair holding the medicine ball with the hands above the head, and the torso should be adjacent to the edge of the chair.

A rope is placed around the tester's chest so that it is held from behind by an arbitrator, for the purpose of preventing his forward movement while throwing the ball with two hands.

Conditions The movement is done using the hands only, and the tester is fixed on the chair, as the attempt is not counted when the tester vibrates or the chair moves during the performance, and an attempt is given instead. The tester is given two attempts, and the best of them is calculated.

**Register:** Index of the explosive power of the arms =  $k \times m / (n)^2$

$$= kg \times m = kg. M/s^2 = Newton/s^2$$

Whereas

- K = mass of the ball (3) kg.

- M = Achieved throwing distance (m).

- N = The time the ball launched from the hands to the ground (s).

### Third: Testing the explosive strength of the muscles of the two legs in the long jump from stability

**The purpose of the test:** to measure the explosive power of the two men.

**Tools:** flat ground that does not make the individual slip, a measuring tape, and a starting line drawn on the ground.

**Description of the performance:** The tester stands behind the starting line with the feet slightly apart and the arms high, the arms swing in front down behind with the knees

bent in half and the torso leans forward until it reaches what resembles the starting position in swimming, from this position the arms swing forward strongly with the extension of the legs along the torso Pushing the ground with the feet vigorously in an attempt to jump forward as far as possible, the distance of the jump is measured from the starting line (the inner edge) until the last trace left by the player near the starting line, or at the point where the heels touch the ground.

In the event that the tester loses balance and touches the ground with another part of his body, the attempt is considered null and must be repeated. The feet must be touching the ground until the moment of ascent. The tester has two attempts to score the best of them.

**Tools used:** Tape measure, lists for recording data.

**Fourth:** Testing the strength of the speed characteristic of the legs

**Test name:** Jumping forward test for three consecutive times: (Hassanein, Mohamed Sobhi, 1995. p. 400) [3].

**The purpose of the test:** Measuring the speed-specific strength of the muscles of the two legs.

**The necessary tools:** A distance of no less than (9) m, a measuring tape.

**Test instructions:** The tester stands behind the starting line, then jumps forward with both feet together for three consecutive jumps. Each tester is given two attempts to calculate the best of them.

**Register:** The distance is measured from the starting point until the last footprint after the triple jump (the distance of the three jumps).

### Fifth: Agility test

**The name of the test:** Slalom jogging between barriers with modified numbers.

**Test tools:** a timer that gives the start signal and calculates the time it takes to perform the test, a recorder that calls the testers and records the results, and barriers.

**Register:** The laboratory records the number that the fixer on the ground reaches at the end of the 30 seconds, and the number of complete cycles is calculated, and 10 degrees are given for each cycle. The degree of the laboratory = the number of cycles x 10 x the number reached by the laboratory that is installed on the ground.

**Sixth:** Rapid shooting test on the two baskets six times: (Diab, Rasha Taleb; c2011, p. 74) [4].

**The purpose of the test:** Measure your stamina and shooting accuracy.

**Equipment needed:** Basketball court - Basketball - Stopwatch.

**Description of the test:** The tester stands directly behind the middle of the final boundary, and with the start signal, he throws the ball forward almost to the middle line of the

field, and runs quickly behind it to catch it and hit it, then shoots it peacefully, then takes possession of it again to perform the same work on the second goal, and so on consecutive times.

**Test instructions:** The tester performs the correct correction under the same technical and legal conditions. If the tester fails to hit the target in any of the six attempts, the test is repeated again.

**Register:** The minimum attempt time is calculated in seconds and its parts.

**Seventh:** Dribbling test between four hurdles for a period of (45) seconds: (Ali Somoum Al-Fartousi & Sadiq Jaafar Al-Husseini, p. 252) [2].

**The purpose of the test:** Measuring the ability to withstand the speed of churn while changing direction.

**Necessary tools:** Basketball court - 4 grills or chairs - tape measure - stopwatch - whistle - basketball.

**Description of the test:** The test requires a flat distance of

at least (12) meters in length. Barriers or chairs are placed in a straight line. A 1.80m long starting line is drawn on the ground, and the first barrier is 3.60m away from the starting line, while the distance between the barriers is 1.80m. It is preferable to put numbers on the ground as shown in Figure (3), as the laboratory stands behind the starting line He is holding the ball, and when he hears the whistle, he runs with the ball bumping between the barriers in the form of the number (8) and continues running until he hears the word stop from the referee, which expresses the end of the (45) seconds.

**Test instructions:** The ball must be when skipping any person on the side of the laboratory far from the barrier, and this requires constantly changing hands after passing each barrier. The tester tries not to touch the barriers or lose the ball during the shuttle run.

The tester gives two attempts to be considered the best.

**Register:** A point is calculated for the tester for each person who passes him in the correct manner within (45) seconds.

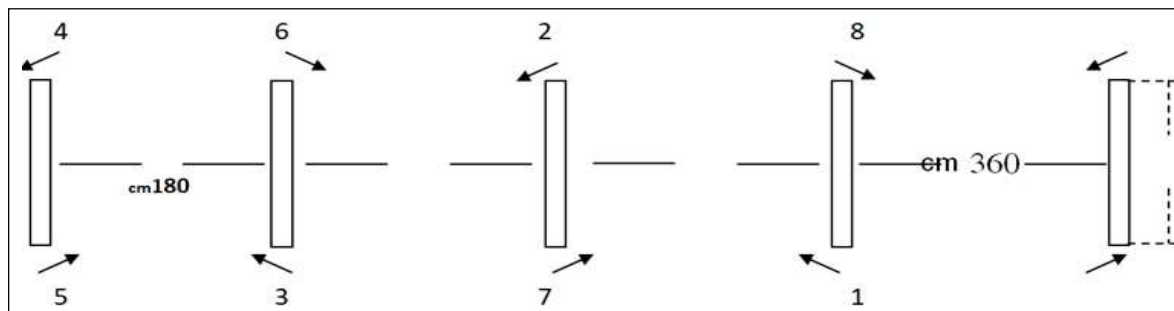


Fig 3: The test shows the plump between four hurdles for a period of (45) seconds

**2.6. Statistical means:** The researchers used the statistical bag system (SPSS) to obtain the results of the research

**3 Presentation, analysis and Discussion of the results**

**3.1 Presentation of the results of tests and pre-and post-test of the vacuum exercises and the biomotor abilities of the physical fitness of the research sample of the two experimental and control groups:**

**Table 2:** Shows the means, standard deviations, and the difference of the mean, and the calculated and tabulated T value between the pre and post-test and tests of the control group.

Variables	Measuring unit	Pre-test		Post-test		Differences Mean	(T) calculated	Sig level	Sig type
		Mean	Std. Deviation	Mean	Std. Deviation				
Shuttle run test (25 m×8) from the high start	Second	52.13	6.36	44.11	5.32	8.02	2.54	0.01	Sig
The explosive power of the arms	Newton	375.11	20.12	410.14	22.48	35.03	2.95	0.003	Sig
The explosive power of the legs	Distance	1.10	0.45	1.90	0.75	0.8	2.98	0.010	Sig
The strength of the speed of the legs	Distance	3.32	0.55	4.85	0.91	1.53	3.32	0.001	Sig
Moving running between barriers	Degree	40.17	5.12	48.1	6.66	7.93	2.11	0.000	Sig
Quick shooting test on the two baskets 6 times	Second	64.36	10.88	52.10	9.21	12.26	2.04	0.000	Sig
Dribbling test between four hurdles for (45) seconds	Degree	15	1.13	17	1.77	2	2.13	0.000	Sig

It is clear from the table that there are significant differences of the post tests between the results of the pre and post tests and the validity

**Table 3:** Shows the means, standard deviations, and the difference of the mean, and the calculated and tabulated T Value between the tests and the pre and post-tests of the experimental group.

Variables	Measuring Unit	Pre-test		Post-test		Differences Mean	(T) Calculated	Sig Level	Sig Type
		Mean	Std. Deviation	Mean	Std. Deviation				
Shuttle run test (25m×8) from the high start	Second	50.11	6.53	32.22	5.14	17.89	4.90	0.01	Sig
The explosive power of the arms	Newton	390.13	22.14	489.14	24.12	99.01	7.07	0.003	Sig

The explosive power of the legs	Distance	1.55	0.43	2.77	0.53	1.22	4.02	0.010	Sig
The strength of the speed of the legs	Distance	3.68	0.86	7.13	1.13	3.45	8.13	0.001	Sig
Moving running between barriers	Degree	41.11	7.13	56.11	8.12	15	4.5	0.000	Sig
Quick shooting test on the two baskets 6 times	Second	59.77	12.11	41.13	9.11	18.64	4.11	0.000	Sig
Dribbling test between four hurdles for (45) seconds	Degree	16	1.73	20	1.95	4	3.44	0.000	Sig

It is clear from the table that there are significant differences between the results of the pre and post-tests and the validity of the post tests.

**Table 4:** Shows the means, standard deviations, and the difference of the mean, and the calculated and tabulated T value between tests and post-tests for the experimental and control groups.

Variables	Measuring Unit	Post -test experimental		Post-test control		Differences Mean	(T) Calculated	Sig Level	Sig Type
		Mean	Std. Deviation	Mean	Std. Deviation				
Shuttle run test (25m×8) from the high start	Second	32.22	5.14	44.11	5.32	11.89	5.58	0.01	Sig
The explosive power of the arms	Newton	489.14	24.12	410.14	22.48	63.86	6.59	0.003	Sig
The explosive power of the legs	Distance	2.77	0.53	1.90	0.75	0.87	3.34	0.00	Sig
The strength of the speed of the legs	Distance	7.13	1.13	4.85	0.91	2.28	6.90	0.001	Sig
Moving running between barriers	Degree	52.11	8.12	48.1	6.66	8.01	2.64	0.000	Sig
Quick shooting test on the two baskets 6 times	Second	41.13	9.11	52.10	9.21	10.97	2.68	0.000	Sig
Dribbling test between four hurdles for (45) seconds	Degree	20	1.95	17	1.77	3	3.97	0.000	Sig

It is clear from the table that there are significant differences between the results of the post-tests and in favor of the experimental group.

**Table 5:** Shows the correlation between vacuum exercises and biomotor abilities.

N	Variables	R calculated	Sig level	Sig Type
1	Vacuum exercises	0.88	0.01	Sig
2	Biomotor abilities			

**4. Discussion**

The researchers see that there is a correlation between biokinetic abilities (explosive power, strength characterized by speed, flexibility, agility, and compatibility). The researchers also explain that the correlation, which is a positive relationship, means that the explosive power of the arms increases from the upper side, and the truth value of the whole movement increases when performing the skill, as the performance specifications depend mainly on the amount of explosive force of the arms, especially the arm responsible for the movement. The researchers also believe that there is a significant correlation between the explosive force and the motor speed of the arms, and the researchers attribute this significant correlation between the explosive power of the arms and the motor speed of the arms to the fact that the force is the result of two motor capabilities, namely strength and speed, and it can be considered the ability to perform a maximum force in the shortest possible time for one time. Single (Muhammad Reda, 2008, p. 6) [10]. The level is better when the explosive force is greater, and the researchers attribute this to the fact that the increase in the strength of the arms leads to an increase in the average length of the arms cycle, which leads to a decrease in the number of arms cycles, and thus the distance is covered in the least time. Therefore, the greater the strength of the arms, the greater the average length of the arms cycle, and vice versa. The researchers also believe that strength is the greatest denominator involved in the elements of physical fitness, and on this basis, strength has an inverse relationship with time, that is, the greater the strength of the arms, the less time it takes, and thus leads to a decrease in the time of the distance traveled by the player.

The researchers also see the need to emphasize the importance of the special physical abilities of the coaches, as they differ in the percentage of their contribution to the achievement according to the requirements of the game or the practiced effectiveness, and that the training process

aims to improve and develop the physical abilities to achieve the best sporting achievements in the races, so it has become one of the duties. The trainers know the extent of the contribution of the special physical abilities in the achievement of the sporting events that they teach in training so that they can take into consideration the biomotor abilities in achieving the sports achievements. Just as compatibility is linked to some other physical attributes such as agility, speed, balance and accuracy, the link between compatibility and speed is shown in the requirements of motor performance in terms of time, and agility, balance and accuracy appear in the requirements of movement in terms of spatial terms, i.e. the body and its parts move through the surrounding space with the required accuracy, and many depend on various sports activities on compatibility as one of the basic elements in order to prepare the athlete for high levels. (Jamal Aladdin, 1985. p.56) [6].

The researchers also believe that biomotor abilities are very important for basketball players, as well as the link between these abilities and the technical performance and composite performance of basketball players to add new and useful things that are considered complementary to the development of the level of physical abilities and consistent with the percentage of contribution to achieving achievement, which is a clear and accurate scientific indicator for coaches when preparing Training curriculum to reach the best achievements and thus win the game.

**5. Conclusions and Recommendations**

**5.1 Conclusions**

1. Correlative relationships appeared between some vacuum exercises and biomotor abilities and physical fitness among basketball players.
2. Some physical and motor abilities (speed, agility, and coordination) achieved the largest number of correlations with the outstanding performance of some physical abilities, especially with speed, strength, flexibility, and agility.
3. Vacuum exercises have a great effect on basketball players in terms of increasing lung capacity and strengthening abdominal muscles.
4. Biomotor abilities have a positive impact on the level of

performance.

5. The experimental group outperformed the control group in the tests used in the post-tests.

## 5.2 Recommendations

1. Relying on biomotor abilities tests that were used in the study, in addition to studying other abilities to know the relationship with some variables.
2. Applying these tests to study the relationship with another gender and with other age groups.
3. The need to study other variables that affect the level of performance.
4. Variables in such topics are studied together to show the percentage of their contribution, since the movement leads to all parts of the body.

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