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## The effect of special exercises to develop some of the physical abilities of female students in basketball

Meriam Liwaa Abdul-fattah<sup>1</sup>✉, Liqaa Abdullah Ali<sup>2</sup>✉ 

1&2 Physical Education and Sport Sciences college for women, University of Baghdad

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### Abstract

The research aimed to prepare special exercises to develop some of the physical abilities of female students in basketball. And to identify the effect of these prepared exercises on some of the physical abilities of female basketball students. Therefore, the importance of research lies in developing some physical abilities in order to develop some physical abilities that the student needs while playing. The two researchers assumed that there were no statistically significant differences between the pre and post-test in the physical abilities of the experimental and control groups. The two researchers used the experimental approach by making a comparison between the pre and post-test between the experimental and control research groups due to the suitability of the experimental approach to the nature of the research. Division (A) in a random manner, the number of which is 20 students, and they represent the research community itself. The two researchers used the design of the experimental and control groups, where the students were divided into two groups, the two groups perform the pre-tests, then the training unit is applied to the experimental group only. Then the experimental and control groups are tested with the test remote. Therefore, the research problem centered on the fact that the basketball game has a high and fast tempo and needs great speed when switching from an offensive to a defensive position and vice versa. The two researchers concluded that the training unit had a clear effect on the development of these abilities very well on the experimental group, and several exercises had a clear effect on the development of physical abilities on the experimental group, and there is a clear difference between the test results of the experimental group and the control group in favor of the experimental group. and this achieves one of the sustainable development goals of the United Nations in Iraq which is (Quality Education). The researchers recommend using the method of training units within the lesson in order to raise the physical capabilities of the students in addition to the skills of the lesson.

### Keywords

physical abilities, special exercises, basketball

### Introduction

Despite the great scientific progress that the world is witnessing and making information in letters, words and images available to anyone who wants to see it or benefit from it in his public and private life in the field of his work, the human mind remains the main axis that gains a direct impact on the life of the individual and his physical and mental capabilities. (As a result of the development taking place in all knowledge sciences and in the sports field in particular, it has become necessary to follow effective scientific formulas to find strengths and weaknesses in physical and skillful performance

and to develop appropriate solutions to overcome obstacles to sports performance). As (alyaa and Intisar) referred (10). Therefore, the importance of the research lies in developing some physical abilities in order to develop some physical abilities that the student needs while she is playing. Therefore, the research problem is centered on the fact that the game of basketball has a high and fast pace and requires great speed when switching from an offensive to a defensive position and vice versa. Therefore, the two researchers decided to give special exercises to

develop some of the physical abilities of the students while they were playing.

**Research two aims:**

- 1- Preparing various exercises in the style of the training unit to develop some of the physical abilities of female basketball students.
- 2- Identifying the effect of prepared exercises on some of the physical abilities of female basketball students.

**Research hypothesis:**

- 1- There are no statistically significant differences between the pre and post-test in the physical abilities of the experimental and control groups.

**Research areas:**

Human domain: Students of the College of Physical Education and Sports Sciences for Girls for the academic year 2022-2023

Temporal domain: From 11-13-2022 to 1/2/2023  
method and procedures

The two researchers used the experimental approach due to the suitability of the experimental approach to the nature of the research. The research community was identified and appointed by the intentional method, and they are third-stage students in the College of Physical Education and Sports Sciences for Women. It is divided into two groups, the two groups perform the pre-tests, then the training unit is applied to the experimental group only, after which the experimental and control groups are tested with the post-test.

**Table (1)**  
**Shows the research community and its sample**

Research community	Research sample	The proportion of the sample from the community	Design method
Students of the Faculty of Physical Education and Sports Sciences for Girls	The third stage, division (A), numbered 20 students, and the research sample was chosen randomly, numbering 10 students	%30	The two researchers used the design of the experimental and control groups

**Used tests**

The two researchers designed a questionnaire to explore the opinions of experts about the most important physical abilities related to the research. The two researchers presented the physical abilities in a questionnaire form to specialists in the field of physical education and sports sciences in order to determine the physical abilities that a student needs to play basketball. And after identifying the most important physical abilities related to basketball and according to the opinions of experts, the tests

were nominated in a form and presented to the same experts, and after determining the most important physical abilities, the two researchers calculated the percentage of all variables as shown in Table 3, and the percentage of tests was also calculated as shown in Table 2, as the percentage of 80% or more was approved, which means agreement of (3) experts out of (5). Thus, (4) abilities were accepted and (2) deleted. As for the tests, (4) tests were accepted and (2) deleted.

**Table (2)**  
**Shows the used tests in the research**

.Seq	Chosen tests
1	Shuttle run test 25m x 8 from the high start (Al-Hamid) (3)
2	Running test for a distance of 20 meters from standing (Shehata) (9)
3	Broad jump stability test. (Al-Rida) (4)
4	Throwing a medicine ball weighing 2 kg with both hands over the head from a sitting position on a chair. (Ismail) (2)

**Table (3)**  
**Shows the percentage of the number of agreed opinions on physical abilities**

.Seq	physical capabilities	The number of agreed opinions	percentage
1	Speed endurance for the muscles of the legs	3	94%
2	Transition speed	5	93%
3	Vertical explosive force of the muscles of the legs	4	88%
4	The explosive power of the arms and shoulders	5	87%
5	Fitness	2	%20
6	Kinetic speed	2	%20

**Table (4)**  
**Shows the percentages of expert opinions about the validity of the tests**

.Seq	Chosen tests	The purpose of the test	The number of agreed opinions	percentage
1	Shuttle run test 25m x 8 from high start	Measurement of speed tolerance for the muscles of the legs	3	94%
2	20m standing test	Transition speed measurement	5	93%
3	Broad jump stability test	Measurement of the vertical explosive force of the muscles of the legs	4	87%
4	Throwing a medicine ball weighing 2 kg with both hands over the head from a sitting position on a chair	Measure the explosive force of the arms and shoulders	5	88%
5	10m sprint test from standing position.	Kinetic speed	2	2%
6	Oblique prone, then standing	Fitness	2	20%

**Used equipment's**

The two researchers used a set of tools and devices and means of collecting information, scientific sources, the international information network, personal interviews, observation, tests and measurements related to the components of physical abilities, the program (SPSS) version (18) for statistical treatments.

**proposed training unit**

In order to obtain a training unit with good effectiveness, it was necessary to look at the modern sources and references related to the science of sports training, which would be sufficient to enrich the researcher with information that would help him in developing the proposed exercises, as well as seeking the help of the supervisors' experiences. The proposed training unit was presented to a group of specialists and experts.

The following are some clarifications for the proposed training unit

- \* Duration of the proposed training module (two and a half months)
- \* Duration of the proposed training module in weeks (ten weeks)
- \* The number of total training units (30) training units
- \* Number of training units per week (three units)
- \* Training days Sunday - Tuesday - Thursday
- \* The time for the entire training units (90-120) minutes
- \* The intensity was used under maximum and medium maximum
- \* The repetitive training method was used to develop speed endurance
- \* The interval training method was used
- \* The exercises were carried out on 11/13/2022 until 2/1/2023

**Table (5)  
Shows the training units**

<b>The duration of the proposed training unit</b>	<b>Two and a half months</b>
<b>The duration of the proposed training module in weeks</b>	<b>Ten weeks</b>
<b>Number of total training units</b>	<b>30 training units</b>
<b>Number of total training units in weeks</b>	<b>Three units</b>
<b>training days</b>	<b>Sunday-Tuesday-Thursday</b>
<b>The full time of the training units</b>	<b>90-120 minutes</b>
<b>Used intensity</b>	<b>under maximal and medium maximal</b>
<b>Training method</b>	<b>Interval training method</b>
<b>Suggested exercises</b>	<b>The exercises were carried out from 12/15/2022 to 3/1/2023</b>

**Table (6)**

**Shows the arithmetic mean, standard deviation, sample size, and the calculated and tabulated t-values in the pre and post tests for the experimental and control groups.**

Shuttle run test (8*25) from high start								
Group	Pre-test		Post test		Sample size	calculate t-values	tabulated t	Significance
	arithme tic mean	stand ard deviat ion	arithme tic mean	stand ard deviat ion				
Experime ntal	50,73	1,61	45,10	1,46	10	20,1	2,26	Sign
Control	50,53	1,09	48,63	0,90	10	16,4		Sign
Under the degree of freedom (10-1 = 9) and the level of significance (0.05)								
For a 20m standing test								
Experime ntal	16,4	3,06	12,2	3,42	10	18,11	2,26	Sign
Control	17,6	2,75	16,9	2,60	10	15,83		Sign
Under the degree of freedom (10-1 = 9) and the level of significance (0.05)								
To test the long jump from stability								
Experime ntal	50,79	0,90	52,5	0,91	10	18,78	2,26	Sign
Control	50,71	0,75	49,59	0,62	10	10,25		Sign
Under the degree of freedom (10-1 = 9) and the level of significance )0.05(								
Throwing a medicine ball weighing (2 kg) over the head from a sitting position on a chair								
Experime ntal	27,4	1,34	37	3,59	10	10	2,26	Sign
Control	27	1,15	31,4	1,42	10	6,25		Sign
Under the degree of freedom (10-1 = 9) and the level of significance (0.05)								

**Table (7)**

**Shows the experimental and control groups, their pre and post arithmetic mean, and the rate of development in the tests**

Shuttle run test(25m*8)from the high start			
Group	pre arithmetic mean	post arithmetic mean	rate of development
Experimental	50,73	45,10	%11,09
Control	50,53	48,63	%9,76
20m standing test			
Experimental	16,4	12,2	%59,75
Control	17,6	16,9	%24,43
Broad jump stability test			

Experimental	50,79	52,5	%10,41
Control	50,71	49,59	%4,71
<b>Throwing a medicine ball weighing (2 kg) over the head from a sitting position on a chair.</b>			
Experimental	27,4	37	%35,3
Control	27	31,4	%16,29

**Discussion**

Table (7) shows the results of the shuttle run test (8 \* 25) from the high start. The results showed that there were statistically significant differences between the results of the pre and post-tests with regard to the experimental group and in favor of the post test. The two researchers attribute the reason for this difference to the arrangement and coordination of the exercises placed in the training unit according to the theories of the science of sports training, in terms of rotation in the work of muscle groups in order to avoid stress, as well as in terms of the sequence of training physical traits, in addition to the method of training used, which is the method of repetitive training.

The two researchers also put the results in tables that make it easier to notice the difference between them, leading to the final results (being an explanatory tool that reduces the possibilities of error and enhances the scientific evidence and gives it strength) Ibrahim (1)

As Saad Muhammad Dakhil believes (that the fundamental and fundamental reason for developing speed endurance is due to choosing the appropriate method for training, which is the method of repetitive training) (6)

On the other hand, the two researchers were keen on a scientific and thoughtful organization in setting the rest period between exercises, as it allows the player to regain energy building again (the rest should not be too long so as not to lead to complete recovery, nor too short so as not to lead to fatigue and a decrease in the level of performance (Zaher) (7)

As for the control group, the results showed that there were statistically significant differences between the pre and post-tests, in favor of the post test, but they were few compared to the

experimental group. The reason for this is due to adopting general exercises to develop speed and not focusing on endurance and giving it enough time to develop it. This is confirmed by Nour Abd and Nada Muhammad Amin (as the game of basketball is one of the games that require high physical effort because it is characterized by a continuous change in the rhythm of the game, which requires players to possess the physical and motor capabilities that enable them to perform the skills of the game (16)

As for the results of the running test for a distance of 20 meters from standing, the results showed that there were statistically significant differences between the pre and post-tests, in favor of the post-test with regard to the experimental group.

The researchers attribute this to the use of the principle of gradation in the preparation of exercises and their application in that the physical exercises are from easy to difficult and the exercises are performed under the factor of time, that is, specifying a period for performing each exercise and allowing the development of the characteristic of transitional speed. A valid test result (18)

As for the control group, the results showed that there were statistically significant differences between the pre and post-tests, in favor of the post test. The rate of development was slow compared to the experimental group, and the reason for this is due to the lack of focus in the partial vocabulary of the tests, and the lack of time given to mastering it, which led to a slight development of those abilities and the emergence of signs of fatigue on the players.

As for the broad jump test of stability, the results showed that there were statistically significant differences between the results of the pre and



post-tests with respect to the experimental group and in favor of the post test. The different beginnings of the exercises and the endings have an effective role in developing the skill, as mentioned by (Fatima and Intisar) (14)

As mentioned by Afrah Numan (the game of basketball requires a technical and high training depth and the possession of players of different physical qualities mixed with physical and skill performance). (12)

(Battle rope exercises have a role in developing physical and motor abilities) and this was mentioned by (Shaima and Lisa) (19). As for the control group, the results showed that there were statistically significant differences between the pre and post tests and in favor of the post test, but the rate of development was low, which is due to weakness in the physical characteristics in general and the explosive strength of the muscles of the legs in particular, "this is in addition to the unregulated technique by the players, which was reflected in the results achieved compared to The results of the experimental group, "and this is what (Ruwaida Thamer and Najm) explained (that the physical-kinetic intelligence that the student enjoys opens the way for her to control her movement and deal with it intelligently when determining the place of her movement when clapping). (15) As for the test of throwing a medicine ball weighing (2 kg) over the head from the sitting position on the chair.

The results showed that there were statistically significant differences between the results of the pre and post-tests with regard to the experimental group and in favor of the post test. And (Noor and Huda) mentioned (that the development of the game of basketball and its constantly changing law as a result of the development of the performance of this game put those interested in it to work to increase research and studies that contribute to the development of this game) (17)

The two researchers attribute the reason for this difference to the effectiveness of the exercises used in the proposed training unit for the

muscles of the legs, for example, exercising the degree of stability, movement and alternating jumping. The two researchers focused on these types of exercises because of their positive impact on the development of the muscles of the legs. The basketball player (needs great strength in his legs that does not require it in the same proportion in his arms) (8)

This is in addition to the researchers using endurance exercises and medical balls to develop strength endurance for the muscles of the legs. Strong and able to perform the skill with the strength and speed required in the lesson under the pressure of the opponent (Mukhtar) (11)

As mentioned by (Liqaa and Nada) that (There is a clear positive effect in developing agility and flexibility and its impact on some complex offensive skills in basketball for female students) (13)

As for the control group, the results showed that there were statistically significant differences between the pre and post tests and in favor of the post test. The rate of development was slight compared to the experimental group. The required development of strength endurance for the muscles of the legs. This is what was explained by (Rasha and Liqa Abdullah) (It is necessary to follow effective scientific formulas to find strengths and weaknesses in physical and skill performance and to develop appropriate solutions to overcome obstacles to sports performance) (5)

### **Conclusion**

Where the two researchers concluded:

The training unit has clearly influenced the development of these abilities very well on the experimental group

Several exercises clearly affected the development of physical abilities on the experimental group

There is a clear difference between the test results of the experimental group and the control group in favor of the experimental group

**The two researchers recommend**

Using the method of training units within the lesson; In order to raise the physical capabilities of the students as well as the skills of the lesson.

### **Author's declaration:**

**Conflicts of interest:** None

We confirm that all tables and figures in this article are ours and written by the researchers themselves.

**Ethical-Clearance:** this manuscript approved by local ethical committee of physical education and sport sciences college for women on (April /2023)

### **Author's contributions:**

All contributions of this study were done by the researchers (M.L. and L.A.) who get the main idea and work on writing and concluding also with number of experts, Ali Smoum in Statistics, Stuart Biddle in revision, Nour Riadh in translating, Mazin Hadi in proofreading

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## تأثير تمارين متنوعة بأسلوب الوحدة التدريبية لتطوير بعض القدرات البدنية لطالبات المرحلة الثالثة بكرة السلة مريم لواء عبد الفتاح<sup>1</sup>، لقاء عبد الله علي<sup>2</sup> 2&1 جامعة بغداد/ كلية التربية البدنية و علوم الرياضة للبنات

هدف البحث الى اعداد تمارين خاصة لتطوير بعض القدرات البدنية للطالبات بكرة السلة. والتعرف على تأثير هذه التمارين المعدة في بعض القدرات البدنية للطالبات بكرة السلة. لذا تكمن اهمية البحث في تطوير بعض القدرات البدنية من اجل تطوير بعض القدرات البدنية من اجل تطوير بعض القدرات البدنية التي تحتاجها الطالبة اثناء قيامها باللعب. واستخدمت الباحثتان المنهج التجريبي بعمل مقارنة بين الاختبار القبلي والبعدي بين مجموعتي البحث التجريبية والضابطة نظرا " لملائمة المنهج التجريبي لطبيعة البحث. وتم تحديد مجتمع البحث وعينته بالطريقة العمدية وهم طالبات المرحلة الثالثة في كلية التربية البدنية و علوم الرياضة للبنات وكان عدد الشعب (4) حيث تم اختيار الشعبة (أ) بالطريقة العشوائية والبالغ عددهم 20 طالبة وهم يمثلون مجتمع البحث نفسه. استخدمت الباحثتان تصميم المجموعتين التجريبية والضابطة حيث تم تقسيم الطالبات الى مجموعتين، تؤدي المجموعتين الاختبارات القبلية ثم يتم تطبيق الوحدة التدريبية على المجموعة التجريبية فقط. بعدها يتم اختبار المجموعتين التجريبية والضابطة بالاختبار البعدي. لذا تتمركز مشكلة البحث لكون لعبة كرة السلة ذات رتم عالي وسريع وتحتاج الى سرعة كبيرة عند التحول من الوضع الهجومي الى الدفاعي والعكس لذا ارتأت الباحثتان بأعطاء تمارين خاصة لتطوير بعض القدرات البدنية للطالبات التي اثناء قيامهم باللعب. واستنتجت الباحثتان ان الوحدة التدريبية قد اثرت بشكل واضح في تطوير هذه القدرات بشكل جيد جدا على المجموعة التجريبية والتمارين العدة اثرت بشكل واضح في تطوير القدرات البدنية على المجموعة التجريبية وهناك فرق واضح بين نتائج اختبار المجموعة التجريبية والضابطة لصالح المجموعة التجريبية. وهذا ما يحقق احد اهداف التنمية المستدامة للامم المتحدة في العراق (التعليم الجيد). وتوصي الباحثتان استخدام طريقة الوحدات التدريبية ضمن الدرس من اجل رفع القدرات البدنية للطالبات الى جانب المهارات الخاصة بالدرس