The Effect of Special Exercises Using a Flexible Mat in Developing the Explosive Power of the Legs and Some Physiological Indicators for Volleyball Players

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Abstract

The research aimed to know the effect of those special exercises in developing some physical abilities and some functional indicators for volleyball players on two different soft floors. Functional volleyball players, and the researcher used the experimental method because it is appropriate to the nature of the research. As for the research sample, it was chosen in a deliberate way, represented by the players of the University College of Knowledge team in volleyball for the sports season (2021-2022), and their number is (14) players representing (100%) of the The total research community The ages of the players ranged between (20-25) years. Where the sample was divided into two experimental groups, the first group, which trained on the elastic carpet (flexible floor), while the second group trained on the volleyball court, as the sample was divided into two experimental groups in a random manner, with (7) players for each group. The researcher concluded the following:

- The exercises used by the researcher had a significant effect on the level of the research variables under study.
- The elastic rug exercises had a positive effect on developing the physical abilities under study.
- The researcher recommended:
- The necessity of using different exercises in terms of ground and resistances and emphasizing them in developing physical abilities and volleyball skills because of their positive impact on development events.
- The use of the soft carpet in the training units of various other games.

Keywords: Exercises, flexible and physiological indicators.

1. Introduction

Volleyball is one of the ball games in particular and team games in general that are included in the general framework and sports activities in the sports culture system of most countries in the mathematically civilized world. Scientific development is the distinguishing feature and the basic basis for the advanced achievements of all individual and team games, so there must be a person who can adapt to these developments in order to achieve the best achievement. Training is one of these important sciences that has an important role in the development of the athlete, and volleyball is one of the games in which training and requirements for raising the level are involved. Each player has his duties according to the position he occupies on the field. Raising high standards is one of the most important goals of sporting achievement.1 Sports excellence is the outcome of sports methods based on science and experience for people who have physical, skill, planning and other capabilities and are distinguished from others by these abilities that qualify them to achieve the best achievements.

Research problem

The scientific study of the training process through the use of training aids has become one of the important pillars upon which the training curricula are built. The use of flexible mat training for the development of physical abilities, skills and functional indicators has appeared. As a diverse and available medium that can be used quickly and does not require high financial capabilities to use it in training duties, which positively affects the preparation of players in this direction. As a result of the lack of research and studies that dealt with training using the elastic, the researcher decided to conduct a study to identify the effectiveness of using exercises on the elastic and its impact on some physical abilities, skills and functional indicators of volleyball players. Through measurement, testing, and personal interviews, given that the researcher is a volleyball player, a first-class player, and a volleyball teacher, through following up on many training and teaching units, she noticed a weakness in the functional and fluid efficiency of the technical skills of volleyball players, especially offensive skills, including crushing and sending. The crushing and blocking wall, which have a direct impact on the accuracy of the outstanding performance of the player in volleyball, which can be developed through the preparation of some (special) compound exercises.

Therefore, the researcher decided to study this problem through the use of training aids (elastic carpet) and the preparation of special exercises and knowing the effect of these exercises on the elastic

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carpet in developing some physical and skill abilities, functional indicators, and the flow of offensive and defensive skills in volleyball.

Research objectives

- Preparing different complex physical and skill exercises for advanced players
- Knowing the effect of those special exercises in developing some physical and skill abilities and some physiological indicators for volleyball players on two different soft grounds.
- Knowing which of the two floors is more contributing to the development of the physical and skill abilities of the players, the hard floor or the flexible floor.

Research hypotheses

- There is a positive effect of compound (special) physical exercises in developing physical abilities and functional and skill indicators.
- There are statistically significant differences between the pre and remote tests of the two experimental groups and in favor of the posttest in the physical abilities, functional and skill indicators of volleyball players.

Research fields

- The human field: the players of the University College of Education's volleyball team.
- Time range: the period from 1/2/2021 to 17/3/2022
- Spatial domain: Ahmed Radi Interior Hall in the University College of Knowledge.

2. Research Methodology

The researcher used the experimental method to suit the nature of the research.

The research community and its sample

As for the research sample, it was chosen in a deliberate way, represented by the players of the University College of Knowledge team in volleyball for the sports season (2021-2022), which numbered (14) players, representing (100%) of the total research community. The ages of the players ranged between (20-25) years. Where the sample was divided into two experimental groups, the first group, which trained on the elastic carpet (flexible floor), while the second group trained on the volleyball court,2 as the sample was divided into two experimental groups in a random manner, with (7) players for each group.

The equivalence of the sample in the research variables

Table [1]. Shows the equivalence of the sample in the power variables

S	Variables	Units	First group		Second group		Sig	Diff.
			Mean	STD.EV.	Mean	STD.EV.		
1	Explosive ability of the legs	Cm	43.37	7.65	41.25	4.33	0.95	No sig.
2	Explosive ability of the arms	Meter	4.33	0.43	4.30	0.43	0.64	No sig.
With a lower significance level (0.05)								

Devices, tools and means of collecting information

- First, the hardware:
- Two (2) electronic stopwatches. Korean origin.
- One (1) electronic clock to measure the pulse, Korea Origin.
- Handy electronic calculator. Chinese Origin.
- Second, the tools:
- Flying balls (12).
- Flexible rug, number (30) pieces, the dimensions of each rug (180 x 120) cm so that it covers half of the field (9) meters with a height of (2) cm
- Measuring tape length (50 m).
- Colored masking tape.
- Two whistles.
- Third: Means of collecting information:
- Arab and foreign sources.
- International Information Network (Internet).
- Auxiliary staff.
- Tests and measurements.

3. Experiments

The first exploratory experiment

The first exploratory experiment was conducted on Wednesday, 8/12/2021, in Ahmed Radi Sports Hall, by the researcher and the assistant work team, appendix, for the tests used in the research on the sample of (3) players who are from the main sample.

The second exploratory experiment

The second exploratory experiment was conducted on Thursday, 9/12/2021, in Ahmed Radi Sports Hall by the researcher and the assistant work team for special exercises on the flexible mat as a "practical training for the researcher to find out the negatives encountered during the test procedure." to avoid it.

Field Research Procedures

Pretests

Pretests and measurements were performed on the first and second experimental research sample at eleven o'clock in the morning on Tuesday 28/12/2021. The medical work team was entrusted to measure functional indicators and the assistant work team to measure physical abilities.

The main research procedures

Before the start of the exercises on the elastic mat for the first experimental group and the exercises on the hard ground for the second experimental group, with the help of the auxiliary work team, the maximum time for each exercise was measured and the pulse rate was measured at rest time and after warm-up and after performing the exercises with the

aim of determining the partial intensity of the exercises, as well as determining the rest periods between Repeating the exercises and repeating the totals, and this was done during the limited period between (13-16/12/2021), and after preparing the curriculum of the training units by the researcher, relying on the scientific foundations through the sources, the application of exercises was started within the training units and in the main section, which It is given by the team coach, starting from Monday 3/1/2022 until Thursday 16/3/2022 by three training units per week for days (Saturday, Monday and Wednesday) within the special preparation stage for a period of (10) weeks at the rate of (30) units Training,3 as the researcher used the method of low-intensity interval training, in which the intensity ranges between (60-80%) and the method of high-intensity interval training, in which the intensity ranges between (80-90%).

Posttests

After completing the exercises on the sample members within the training units, the assistant work team conducted the post tests on the sample members for the first and second experimental groups on (Saturday and Sunday) corresponding to 19-20/3/2022. On the first day, the measurement of functional indicators and physical abilities, taking into account the same data and spatial conditions of the pretests, and then unloading the data of the post-tests for the two groups in a special register to record the research data for statistical processing.

4. Results and Discussions

Presentation, analysis and discussion of results

Presentation and analysis of the results of physical abilities between the pre and posttest for the first experimental group

Table 2. Show means, standard deviations, mean difference, standard deviation, calculated (t) values and the significance of differences between the results of the pre and posttests in the physical abilities tests of the first experimental group

Variables	Units	Pretest		Posttest		Mean diff.	STD.Diff.	(t) calculated	Diff.
		Mean	STD.EV.	Mean	STD.EV.				
Explosive ability of the legs	Cm	43.37	7.65	63.17	3.13	19.55	4.26	12.14	Sig.
Explosive ability of the arms	Meter	4.33	0.43	5.69	0.28	1.36	0.44	8.5	Sig.

Tabular (t) value (1.94) at a degree of freedom (6) and at a significance level of (0.04)

It can be seen from Table (2)

In the test of the explosive ability of the two men: the difference of the means between the results of the pre and posttests was (19,55), with a standard deviation of the differences of (4,26), and the calculated (t) value was (12,14), which indicates the significance of the differences between the two tests. The pre and posttest, in front of a degree of freedom (6), and in the interest of the post test.

In the explosive ability test of the two arms: the difference of the mean between the results of the pre and posttests reached (1,36) with a standard deviation of the differences of (0.44), and the calculated value (t) was (8.5), which indicates the significance of the differences between the two tests The pre and posttest, in front of a degree of freedom (6), and in the interest of the post test.

Presentation and analysis of the results of physical abilities between the pre and posttest for the second experimental group

Table 3. means, standard deviations, mean difference, standard deviation, calculated (t) values and the significance of differences between the results of the pre and posttests in the physical abilities tests for the second experimental group

Variables	Units	Pretest		Posttest		Mean diff.	STD. Diff.	(t) Calculated	Diff.
		Mean	STD.EV.	Mean	STD.EV.				
Explosive ability of the legs	Cm	41.25	4.33	48.26	3.04	7.01	1.87	10.01	Sig.
Explosive ability of the arms	Meter	4.30	0.43	4.60	0.40	0.30	0.12	7.5	Sig.

Tabular (t) value (1.94) at a degree of freedom (6) and at a significance level of (0.04).

It can be seen from Table (3).

In the test of the explosive ability of the two men: the difference of the means between the results of the pre and posttests was (7.01) with a standard deviation of the difference of (1.87), and the calculated t-value was (10.01), which indicates the significance of the differences between the pre and posttests. And in front of a degree of freedom (5) and in favor of the post-test.

In the explosive ability test of the two arms: the difference of the means between the results of the two tests, the pre and posttests (0,30), with a standard deviation of the differences of (0.12), and the value of (t) calculated was (7.5), which indicates the significance of the differences between the pre and post tests and in front of the degree of Freedom (5) and in the interest of the distance test.

Presentation and analysis of the results of functional indicators between the pre and posttest for the first experimental group

Table 4. means, standard deviations, mean difference, standard deviation, calculated (t) values and the significance of the differences between the results of the pre and posttests in the results of the functional indicators for the first experimental group

Variables	Units	Pretest		Posttest		Mean Diff.	STD. Diff.	(t) Calculated	Diff.
		Mean	STD.EV.	Mean	STD.EV.				
Pulse before effort	Stroke/ Min.	67.87	2.10	62.75	2.25	5.12	2.70	5.01	Sig.
Pulse after effort	Stroke/ Min.	182.25	2.187	180	3.116	2.25	1.73	3.46	Sig.
Vital capacity	N/Min.	5.83	0.72	5.35	0.55	0.63	0.2	5.62	Sig.

Tabular (t) value (1.94) at a degree of freedom (6) and at a significance level of (0.04).

From the above table it can be seen

In the vital capacity test: the mean difference between the results of the pre and posttests reached (0.63) with a standard deviation of the differences of (0.2), and the calculated (t) value was (5.62), which indicates the significant differences between the pre and posttests in front of the degree of freedom (6) for the benefit of the post-test.

Presentation and analysis of the results of functional indicators between the pre and posttest for the second experimental group

Table 5. means, standard deviations, mean difference, standard deviation, calculated (t) values and the significance of differences between the results of the pre and posttests in the physical abilities tests for the second experimental group

Variables	Units	Pretest		Posttest		Mean Diff.	STD. Diff.	(t) Calculated	Diff.
		Mean	STD.EV.	Mean	STD.EV.				
Pulse before effort	Stroke/ Min.	66	2.672	64.125	1.552	1,34	1.07	-2.904	Sig.
Pulse after effort	Stroke/ Min.	182.87	2.531	177.25	1.752	4.54	1.56	-9.956	Sig.
Vital capacity	N/Min.	4.982	0.635	5.352	0.557	0.370	0.289	-3.140	Sig.

Tabular (t) value (1.94) at a degree of freedom (6) and at a significance level of (0.04).

From the above table it can be seen

In the pulse test before the effort: the difference of the mean between the results of the pre and posttests was (0.370), with a standard deviation of the difference of (0.289), and the calculated (t) value was (3.140), while the level of error was (0.026), which indicates a significant The differences between the pre and posttests at the level of error (0.05) and in front of the degree of freedom (5) and in favor of the post test.

In the pulse test after effort: the difference of the mean between the results of the pre and posttests was (0.370), with a standard deviation of the differences of (0.289), and the calculated (t) value was (3.140), which indicates the significant differences between the pre and posttests at the level of error (0 05) and in front of the degree of freedom (5) and in favor of the post-test.

Presentation, analysis and discussion of the results of the post-tests of the physical abilities of the first experimental and second experimental groups

Table 6. means, standard deviations, calculated (t) values and significance for the first and second experimental groups for the post-tests of physical abilities

Variables	Units	Experimental group		Control group		(t) Calculated	Diff.
		Mean	STD.EV.	Mean	STD.EV.		
Explosive ability of the legs	Cm	63.17	3.13	48.26	3.04	8.37	Sig.
Explosive ability of the arms	Meter	5.69	0.28	4.60	0.40	5.73	Sig.

Tabular (t) value (2.17) at a degree of freedom (12) and at a significance level (0.05).

5. Discussions

Through the presentation of the above tables, it was found that the results indicated the fulfillment of the second hypothesis of the research, where the members of the experimental group developed in all physical abilities.4 The exercises in the results of the tests of the explosive strength of the muscles of the legs and arms of the experimental group were great, which indicates the effect of the muscle groups in the exercises used by them, as well as due to the use of the correct scientific foundations for the components of the training load,5which are (intensity, size, comfort), which are consistent with what the scientific sources mentioned and what was mentioned Experts specialized in the field of sports training, where exercises were given in an orderly manner,6 which led to an increase in the individual's ability as a result of performing the exercises and thus led to the imprinting of the body's organs on the optimal performance of these exercises, by stimulating all or most of the fibers of one muscle, by increasing the nervous stimuli increases The number of muscle fibers involved in contraction,7 and we see that the explosive force is important for the volleyball player, as others confirms,the explosive force occupies the first place among the physical abilities in most sports activities, as it expresses a "dynamic action through which the ball is hit with a strong and high speed".8

6. Conclusions

- The exercises used by the researcher had a significant effect on the level of the research variables under study.
- The elastic rug exercises had a positive effect on developing the physical abilities under study.
- Flexible mat training has brought about positive changes in the physiological indicators that the study had done.

7. Recommendations

- The necessity of using different exercises in terms of ground and resistances and emphasizing them in developing physical abilities and volleyball skills because of their positive impact on development events.
- Using various other aids to work on developing and upgrading the technical level of volleyball.

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