The Impact of special exercises prepared according to specific periods of time for some types of muscular strength and accuracy of performance: The skill of smashing shot of Volleyball

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Abstract

The research aims to prepare special exercises according to specific periods of time for young volleyball’s players, and to identify the effect of these exercises in developing some physical capabilities and the accuracy of the performance of the smashing shot skill in volleyball for young players. The research result confirmed that there are significant differences between pre and post - tests in the physical and skill capabilities of the research sample. The researcher used the experimental approach and statistical means, the sample was from AL-Anbar youth team of volleyball under (19) years which contains (12) players, the results of the research were also presented and discussed, through which the objectives of the research and its hypotheses were reached. The researchers found, a set of conclusions and recommendations, including that the special exercises applied by the members of the research sample positively affected the improvement and development of the results of post - tests for the physical capabilities under study. The special exercises, prepared according to specific periods of time, were appropriate to the capabilities of the players, and thus the development took place in the results of the post-tests. The researchers recommended that the trainers have to adopt these exercises that would promote the physical and skill capabilities in volleyball, and apply training curricula according to specific periods of time, taking into account the severity, greatness and comfort.

Keywords: special exercises prepared, time, muscular strength

How to cite this article: Mukhlif AK, Awad SD (2020): The impact of special exercise prepared according to specific period of time for some types of muscular strength and accuracy of performance: The skill of smashing shot of volleyball, Ann Trop Med & Public Health; 23(S16): SP231621. DOI: http://doi.org/10.36295/ASRO.2020.231621

1 – Introduction

The international sports arena has recently witnessed a wide development in the training process and its methods in order to advance the level of the player in most sporting events; training is a basis for building and developing physical and skill capabilities, and that these capabilities have an effective role in carrying out their tactical duties in a positive and more effective manner, and team games, including volleyball, require from their players high levels of physical ability and accuracy of skillful performance to get achievement, this
was confirmed by (AL-Kashif) "achieving high-level accomplishments requires the availability of the appropriate and continuous amount of physical and skill preparation" (1).

These capabilities do not come by instinct only, but also through the use of methods and means of athletic training that qualify the athlete to adapt the load that falls on him. The game of volleyball requires a high speed in performance, accuracy and change in harmony, this is what distinguishes it from other games as the player needs requirements for the purpose of achieving high accomplishment. Special exercises are one of the methods of sports training that aim to raise the efficiency of players in terms of physical and skill. It is well known in this field that there are many methods based on scientific foundations for the development of physical and skill capabilities through which the player can improve skillfully and tactically, one of these methods is the training in specific periods of time method, which is characterized by a continuous and regular exchange between exercises and rest. The researcher works to use the exercises prepared according to the specific periods of time, so that the exercises are sufficient to cause high changes in the level of the special capabilities of volleyball, As one of the most important characteristics of volleyball is the rush and calmness in playing during a short period, the importance of this research lies in preparing special exercises implemented according to two methods of training, low-intensity and high-intensity training to raise the level of physical and skill capabilities of young volleyball players.

1-2 Research problem:

Through the work of the researcher in this field as a former player and a current teacher for this game; as well as his follow-up to the Iraqi Volleyball Championship matches, the researcher noted the low level of performance of the players in the physical and skill capabilities, which appeared through the fluctuation of the team level from one match to another, the matter that pushed the researcher to find new training means by choosing a training method that can contribute to developing the physical and skill capabilities of the players to achieve positive results, as well as the problem prompted the researcher to follow the scientific foundations when setting exercises in terms of greatness, intensity and rest periods to reach the best levels Achievement.

1-3 Research Objectives

1. Preparing special exercises according to specific periods of time for volleyball players.

2. Knowing the effect of special exercises according to specific periods of time in developing some physical abilities and the accuracy of performing the skill of smashing shooting with volleyball for young players.

1-4 Research hypotheses:

1. There are significant differences between the pre and post - tests in the physical and skill capabilities of the research sample.

5- Research fields:

1-5-1 The human domain: AL- Anbar youth volleyball team under the age of (19) years and they are (12)

1-5-2 Time Range: 5/24/2020 to 7/26/2020

1-5-3 Spatial field: Ramadi Volleyball Club Stadium.

2-1 Research methodology:

The curriculum is "a way for a person to reach the truth" (1) the researcher must choose the appropriate approach imposed by the nature of the problem that the researcher intends to study, so the research problem imposed the use of the experimental approach.

2-2 The research sample

The researcher chose the Anbar youth team in volleyball for the season (2019-2020), which consists of (12) players, they were chosen in the deliberate manner in which the training method was applied, so the researcher chose AL- Anbar youth team in volleyball because they were the first in the championship and on the basis that the club management Provides facilities for the researcher.

2-3 Means of gathering information, devices and tools used:

2-3-1 Means of collecting information:

The researcher used several methods to collect the information required in his research:

1- Arab and foreign sources and references.

2- Conducting some interviews with experts and specialists.

3- The tests.

4- The assistant team.

5- Statistical means

2-3-2 Devices and tools used:

1. An electronic stopwatch (Casio).


3. Chalk.

4. Adhesive tape.

5. Whistle.

6. A medical ball weighing (3) kg.

7. Volleyball court.
8. Chair.
10. Signs of the stadium (6).
11. Volleyball balls (25).

2-4 Physical and skill tests

2-4-1 Vertical jump test (jump to attack) 1:

- **The goal of the test:** to measure the vertical explosive power of the legs.
- **Unit of measure:** centimeters.
- **Tools:** a blackboard attached to the wall where its lower edge above the floor (150 cm), after that to be raised from (151-400 cm), pieces of chalk (you can do without the blackboard and put the marks on the wall directly according to the conditions of performance) as in Figure (1).

- **Performance specifications:** The player dips his fingers with a powder, his face toward the blackboard, extends the arms as high as possible, and sets a mark with the powder on the blackboard, the heels touching the ground.

- The player dips the hand marked with the powder, jumping is made after approaching three steps that end at the place of the jump to perform the vertical jump with the distinctive hand.

- The player is to perform three attempts; the best attempt is accounted for him.

- **Test Administration:**
  - A person that calls out names and records results.
  - A referee that calculates grades and notes performance.

- **Calculating scores:**
  - The score of the player is the number of centimeters between the line that reaches it from the standing position with arms extended high and the point he reaches it as a result of jumping up close to the nearest centimeter.
  - **Registration:** the distance between the first and second mark expresses the amount of jumping power the player has for the two legs measured in (cm).

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1) Muhammad Subhi Hassanein, Hamdy Abdel-Moneim, the scientific foundations of volleyball and measurement methods physical- skill- cognitive - psychological - analytical, i 1, (Cairo, AL-Kitab Center for Publishing, 1997), p. 56.
2-4-2 test of forward jumping for maximum distance during(5s)\(^{(1)}\):

- **The goal of the test**: Measurement of force accompanied by velocity of the two legs.
- **Required tools**: stadium within (20-25 meters), a tape measure, a stopwatch.
- **Test performance**: from the position of fully bent the knees, and upon hearing the starting signal, the player jumps forward and for the possible maximum distance, with no part of the body touching the ground except the feet and not departing from the drawn lines.
- **Registration**: measuring the distance the player reached within 5 seconds.

2-4-3 Back’s stretch position with knees bent\(^{(2)}\):

**Purpose of the test**: Measuring muscular endurance (strength tolerance) of the abdominal muscles.

- **The necessary tools**: a rug and a wooden ruler, with a length of one meter and a width of 5 cm.
- **Performance description**: The player takes a lying position on the back, and then bends the knees on the ruler while pulling the heels towards the seat so that the distance between them is as little as possible.

- The player will keep the ruler under the knees for the duration of the test.

- The player places the hands behind the neck and one of the players fixes the player's heels during the test. When the player is given the starting signal, he sits so that he alternately touches the right knee in the left elbow and the left knee in the right elbow, and the player continues to repeat the previous performance as many times as possible until fatigue.

**Scores calculation**: The player's score is the number of times of correctly standing from lying.

2-4-4 Test the accuracy of the diagonal and straight smashing shot\(^{(3)}\):

**The purpose of the test**: to measure accuracy of the diagonal and straight smashing shot


\(^{(3)}\) Muhammad Subhi Hassanein, Hamdi Abdel-Moneim; Source previously mentioned, 1997, pp. 208-209.
**Tools:** volleyball court, (15) volleyball balls, coach and two placed nets.

**Performance specifications:** the player performs smashing shots from center (4) (via the trainer) from center (3) and the player must perform (5) smashing shots in the diagonal direction on the net in the center (5), and (5) other smashing shots towards the straight direction on the net in the center (1), the time period between one attempt and another (20) seconds.

Method of registration:

- (4) Points for each correct smashing shot in which the ball falls on the net.
- (3) Points for each correct smashing shot in which the ball falls in the planned area.
- (2) Points for every correct smashing shot in which the ball falls in the two areas (A - B).
- (zero) for each failed smashing shot.

![Figure 2: Test the accuracy of the diagonal and straight smashing shot](image)

**2-5 Exploratory experience of physical and skill tests:**

On Sunday, 5/24/2020, (4) players from the research sample was randomly selected. The objective of this experiment was as follow:

1- Checking the validity of the devices and tools used.

2- The adequacy of the supporting work team and their understanding of the workflow.

3- Knowing the suitability of the tests used for the sample level.
4- The extent of the players' response and interaction with the tests.

5- Determine the time required to carry out the tests.

6- Knowing the obstacles that may appear and avoiding mistakes.

2-6 field research procedures:

2-6-1 Pre - tests:

The researcher, along with the support team, conducted the pre -tests on Tuesday 26/5/2020 at ten A.M, on the research sample in the Ramadi Sports Club stadium, where the tests were conducted on the Sunday.

2-6-2 Training curriculum:

The proposed training curriculum was prepared to be presented to the experts and, as this curriculum included special exercises based on the foundations of specific periods of time training, where the exercises prepared by the researcher in the curriculum, amounting to (16) exercises, were distributed in the training units appropriately and consistently taking into account the repetition of the exercises in a way that guarantees a comprehensive development of all physical and skill capabilities under study and in a manner commensurate with the level of the sample and the training stage. The exercises were dispensed over eight weeks, at the rate of three training units per week. The training load gradually increased (1: 2). The exercises were applied in the main section of the training unit and with the assistance of the support team during the end of the special preparation period. After each training unit, the players are divided into two groups to ensure mastering the variables under study.

2-6-3 Post-test:

After completing the implementation of the training program, the post- tests of the research sample for physical and skill tests were conducted on Sunday,7/26/2020 to identify and determine the change in physical and skill capabilities that occurred with the research sample and in the same context used in the pre- tests.

2-7 Statistical means:

The researchers used the SPSS statistical pouch program to treat the results.

3 Presentation, analysis and discussion of results

3-1 Presentation, analyze and discuss the results of physical and skill capabilities of the experimental group for pre and post – tests
Table (1) Statistical results for pre and post-tests of physical capabilities of the research sample

<table>
<thead>
<tr>
<th>Physical tests</th>
<th>Measuring unit</th>
<th>Pre-test</th>
<th>Post-test</th>
<th>The value of the differences</th>
<th>T Value</th>
<th>Tabular T Value</th>
<th>Calculated</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical jumping (attack to (jump)</td>
<td>CM</td>
<td>23.166</td>
<td>21.583</td>
<td>8.083</td>
<td>8.778</td>
<td>2.201</td>
<td>4.331</td>
<td>Significant</td>
</tr>
<tr>
<td>forward jumping for maximum distance during (5s)</td>
<td>CM</td>
<td>1.772</td>
<td>4.33</td>
<td>2.092</td>
<td>4.75</td>
<td>2.201</td>
<td>5.159</td>
<td>Significant</td>
</tr>
<tr>
<td>Back’s stretch position with knees bent</td>
<td>Number</td>
<td>5.904</td>
<td>18.166</td>
<td>6.186</td>
<td>1.250</td>
<td>2.201</td>
<td>4.175</td>
<td>Significant</td>
</tr>
</tbody>
</table>

The number of players (12), degree of freedom = 12-1 = 11, and under a significance level (0.05) and a tabular (T) value= (2.201)

Table (1) shows that the calculated value of (T) for the tests (vertical jump) of the research sample was consecutive (4.331), which is greater than the tabular (T) value (2.201) at the degree of freedom (11) and the error rate (≤ 0.05) and this indicates that differences are significant.

The researcher shows that the development demonstrated by the special exercises in the results of the explosive strength testing of the two legs for the research sample was significant, which indicates the influence of muscle groups by the exercises used. "And also this progress is due to the use of the correct scientific foundations for the training components namely (intensity, massiveness, comfort) Which is consistent with what was mentioned by the scientific sources, and what was mentioned by experts specializing in the field of sports training science, where exercises were given in an orderly manner, which led to an increase in the individual’s ability as a result of performing exercises and thus this led to the accustomed of the body's systems on the optimal performance of these exercises, by thrilling each or most muscle fibers; the increase in neurotransmitters increases the number of muscle fibers involved in contraction "(1).

The researcher believes that the explosive power is important to the volleyball player, as (Bollok) stresses: "The explosive force is ranked first among the arrangement of physical abilities in most sports activities" (2).

As for the variable of forward jumping for the maximum distance during (5s), the calculated value of (T) for the test (forward jumping to the maximum distance during (5s) for the search sample was consecutive (5.159), which is greater than the (T) tabular value (2.201) at the degree of freedom (11) and the error rate (≤ 0.05) This indicates that the differences are significant.

The researcher attributes the significant difference in the pre- and post-test in the forward jump test at the maximum distance during (5s) which measures the speed and the force of the muscles of the two legs, to the

(1) Muhammad Subhi Hassanein; Source previously, 1997, p. 228.

References:

exercises that were prepared and used by the research sample that was focused on performing it strongly and at the same time, i.e. not neglecting the required speed in performance, Here (Shehata and Berekha 1995) stress that "the increase in strength should be without sacrificing speed, and increasing speed without sacrificing strength, but rather the two characteristics must be taken care of together, which show its importance in various sporting activities" (*). The effectiveness of special muscle strength exercises in performing the various jumps (physical, skill) has an effective impact on the development that occurred in the strength marked by speed.

The calculated (T) value of the test (back's stretch position with knees bent) of the research sample was consecutive (4.175), which is greater than the (T) tabular value (2.201) at the degree of freedom (11) and the error rate (≤ 0.05) and this indicates that differences are significant.

The researcher shows that endurance and strength are important and necessary physical attributes of the volleyball player, as the player needs a certain level of muscle strength for long and repeated periods of continuous smashing shot skill on the net, this was confirmed by (Ali Mahdi Hadi and Adil Majeed Khazaal 2015): "The efficiency of the individual or the ability of the vital body systems to resist fatigue during an effort characterized by continuity in the presence of resistors characterized by an average degree, The leg's muscles' importance increases for volleyball players, as the player relies on fast movements, repeated stops, change in direction, repeated jumps up, coverage and repetitions movements of short distances to achieve the performance"(1).

This relationship is evidence of the efficiency of the body's systems to continue performing for long periods, as well as adapting to sudden situations without feeling tired (2).

The researcher attributes the cause of the development in the performance of the smashing shot to the exercises applied by the research sample, as it led to the development of the most important ability to perform the smashing shot which is the explosive ability of the muscles of the legs and arms, as the development of the explosive capacity of the muscles of the legs led to the height of the jump and the explosive capacity of the muscles of the arms and consequently, it led to strength in shots of volleyball.

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Table (2) Statistical results of the pre- and post-tests of the skill of precision smashing shot volleyball

<table>
<thead>
<tr>
<th>Significance</th>
<th>T Value</th>
<th>The value of the differences</th>
<th>Post-test</th>
<th>Pre-test</th>
<th>Measuring unit</th>
<th>Skill tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Significant</td>
<td>4.531</td>
<td>0.828</td>
<td>1.083</td>
<td>4.881</td>
<td>5.136</td>
<td>Diagonal</td>
</tr>
<tr>
<td>Significant</td>
<td>4.534</td>
<td>0.699</td>
<td>0.916</td>
<td>4.586</td>
<td>12.333</td>
<td>Straight</td>
</tr>
</tbody>
</table>

The number of players (12), degree of freedom = 12-1 = 11, and under a significance level (0.05) and a (T) tabular value = (2.201).

Table (2) shows that the calculated value of (T) for the skill tests of the research sample was respectively (4.531 and 4.534) and the skill tests for the research sample were respectively (accuracy of the skill of the diagonal and straight smashing shotting), which is greater than the (T) tabular value (2.201) at the degree of freedom (11) and the error rate (≤ 0.05) this indicates that the differences are significant.

Thus, the results indicated the realization of the research hypothesis, as the individuals of the research sample developed in all skills, and this difference appeared with the effect of training on the exercises used and under the researcher's supervision on performing the exercises in the main section of the individuals of the research sample.

The researcher refers the reason for the development in the performance of smashing shot to the exercises applied by the research sample, as it led to the development of the most important ability to perform smashing shot which is the explosive ability of the muscles of the legs, as the development of the explosive capacity of the muscles of the two legs led to the height of the jump and the explosive ability of the muscles of the arms, and thus led to strength in smashing shot in volleyball, where (Riyad Khalil and others 2012) assert: "The skill of smashing shot requires specific efficiency and quality of players who have special characteristics such as: (tallness, explosive strength of the muscles of the two legs and arms, high jump, speed and accuracy in shotting the ball)" (1).

The researcher adds that the result of this development led to an increase in the height of the jump in addition to the other capabilities mentioned above, and this has contributed greatly to the skill performance with agility and high flexibility and shotting the ball quickly, forcefully and precisely over the net with the appropriate direction and location, as (Essam Abdel Khalek 1994) indicates: "The kinetic performance of the skill depends on the special physical and vivid capabilities" (2).

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4 - Conclusions and recommendations

4-1 Conclusions

The researcher’s conclusions are:

1- The special exercises applied by the members of the research sample positively affected the improvement and development of the results of all post - tests of the physical and skillful capabilities under study.

2- The special exercises prepared according to specific periods of time were appropriate to the capabilities of the players, and thus the development took place in the results of the post-tests.

4-2 Recommendations

1. The trainers approve the exercises that would develop the physical and skill capabilities in volleyball.

2. Developing training curricula prepared according to specific periods of time taking into account the severity, greatness and comfort.

3. Conducting similar studies to the other physical and skill capabilities of volleyball.

Reference

- Muhammad Subhi Hassanein, Hamdi Abdel-Moneim, the scientific foundations of volleyball and measurement methods physical- skill - cognitive - psychological - analytical, i 1, (Cairo, AL-Kitab Center for Publishing, 1997).
- Muhammad Subhi Hassanein, Hamdi Abdel-Moneim; Source previously mentioned, 1997.
- Ali Mahdi Hadi and Adil Majeed Khazaal, 2015, aforementioned source.