The impact of special exercises on developing kinetic compatibility and fitness and its reflection on the accuracy of performing serving and sky ball serving "star trek" skills in volleyball

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Abstract:

Volleyball is one of the collective sports that depend greatly on the spiker's abilities to master the kinetic and basic skills. It is a sport that requires a great deal of compatibility and fitness to acquire the perfect and elaborate kinetic skills with high accuracy for quickly, accurately and smoothly performance in order to carry out the required kinetic duty.

The research aimed to:

-Identify the players' kinetic compatibility and fitness level and their reflection on the performance accuracy of serving and star trek skills in volleyball.

-Preparing special exercises for improving the kinetic compatibility and fitness and their reflection on the performance accuracy of serving and star trek skills in volleyball.

-Identify the impacts of the special exercises on improving the kinetic compatibility and fitness and their reflection on the performance accuracy of serving and star trek skills in volleyball.

The most significant conclusions that the research figured out are:

1- There are significant differences between the pre- and post tests for the research groups in all research variables in favor of the post tests.

2- There are significant differences between the post tests for the research groups in all research variables in favor of the experimental group.
Key Words: special exercises, kinetic compatibility, fitness, star trek, volleyball

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1- Introduction

Volleyball is characterized by interrelation of its basic skills. The kinetic abilities play an important role in mastering and improving the basic skills in many games and sports events such as volleyball since it's one of the sports that requires many physical and kinetic skills, especially the kinetic compatibility and fitness, so exercising should work on improving the physical, kinetic and skillful abilities in accordance with the requirements of the skillful performance. This was affirmed by (Maha Mohammed Al-Hagrassy, 2007: 1)" Sports training contributes significantly in improving general and special abilities required by practicing sports activity by good planning of its programs". "This is because it's characterized by fast rhythms, following-up and continuous exchanges between offensive and defensive skills", as well as performing fast defensive and offensive movements that rely on fitness and neuromuscular compatibility."(Mohammed Abdallah Mahibis, 2012: 32). Any failure or weakness in performing a skill results in imperfection in performing the following skills, and since some skills are characterized by rapid performance, surprise and quick change of body position, therefore players have to perform all skills perfectly and very quickly. As volleyball spikers are characterized by height of body and Macrocolia, which results in the height of the body weight center” center of gravity” from the ground, which requires greater effort in achieving a high level of compatibility and fitness. The importance of compatibility in volleyball results from its prominent role in winning. Compatibility in volleyball is a basic technique, as well as, the psychological and kinetic requirements reflected on the player's technique level. This is consistent with the point of view of (Abo El-Ela Ahmed Abdel- Fattah, 1997:205)" the ability to score a point through fast and accurate kinetic performance with the least possible effort." (Nagah Mahdi Shalash & Mazen Abdul Hadi, 2010:71) identifies it as” the individual's ability to move two or more different muscles groups in two different directions at the same time”. We can note the importance of the muscular and kinetic compatibility through observing the player's ability to keep balance, bearing, fitness, adjusting the kinetic movements inside the court. This was confirmed by (Robert N. Singer: R.1982. P: 199)" it's the individual's ability to control different parts of the body involved in performing a specific kinetic duty and connects these parts through an effective, single and smooth movement to perform this kinetic duty". This is consistent with the opinion of (Wajih Mahjoub, 1989: 27)" it's the individual's ability to control his muscles individually or jointly as the activity requires”. Fitness also is considered one of the important kinetic qualities in most sports. This was affirmed by( Mohammed Hassan Allawi & Mohammed Nasraddin Radwan, 2001: 236)” fitness is one of the most significant kinetic features in the sports
activities that require changing the body direction or changing its position in air or on the ground, or starting and stopping quickly, or trying to incorporate many kinetic skills within one frame, or kinetic apraxia within changeable and different conditions with great compatibility, accuracy and speed” (Winnick P, Short X, 1985, p: 86) has identified it as “the ability to change quickly the body direction or any part of it; it's characterized by speed, capacity strength characterized by speed, and compatibility; therefore, it's performing a specific and particular duty”. Fitness can be improved by performing kinetic skills and trying to connect the skills parts altogether, this is consistent with the opinion of (Kamal Jameel Al-Rabadi, 2004:101) “it's the player's ability to increase performing the kinetic skills and the ability to reconcile between them, which helps so much in improving fitness”. The research problem lies in the disparity in the level of kinetic compatibility, fitness, and the accuracy of serving and star trek skills for the spikers within the match, that's because they're basic and important skills in forming any offensive on the opposing team, which motivates the researchers to find a solution for this problem by depending on the possibility of studying the improving of kinetic compatibility and fitness, and their reflections on performing accurately the serving and star trek skills in volleyball. So the researchers attempted to study the problem by preparing special exercises for improving the kinetic compatibility and fitness, and their reflections on performing accurately the serving and star trek skills in volleyball.

The research aimed to:

-Identify the players’ levels in kinetic compatibility and fitness, and their reflections on performing accurately the serving and star trek skills in volleyball.

- Preparing special exercises for improving the kinetic compatibility and fitness and their reflection on the performance accuracy of serving and star trek skills in volleyball.

-Identify the impacts of the special exercises on improving the kinetic compatibility and fitness and their reflection on the performance accuracy of serving and star trek skills in volleyball.

2.1. Research Approach

The researchers used the experimental approach with two" equivalent- groups" technique and the correlation between them as it fits the research problem.

2.2 The Research Sample

The process of selecting the sample is" a survey of a specific part of the original community, then generalizing the results on the whole community"(Mohammed Hassan Allawi & Mohammed Nasruddin Radwan, 2000: 2013). The sample community was the advanced players at Al-Dhuluiya sports club in the season 2018/2019. They were (16) players, and the sample contains( 12) players selected randomly: (4) players were excluded for performing the exploratory experiment, thus
the percentage of the research sample was (75%). They were divided into two groups; the control and experimental groups, according to the playing position of the player by (6) players into each group.

3.3 Means, Devices and Tools:

Arabic and foreign references- tests and scale- stationery- Electronic computer-(8) legal balls-measuring tape- legal court-(2) Fox whistles.

2.4 The research used tests:

After reviewing the sources and references, the researchers used the following tests:

- The numbered circles test. ([Mohammed Sobhi Hassanein, 1995:415])

- Fitness test ([Hassanien, 1987: 351])

- Measuring the serving skills accuracy test ([Marwan Abd-Al-Hamid, 2001:296])

- The straight star trek skill test ([Ali Salloum Jawad Al-Hakim, 2008:198])

2.5 Procedures of the field research:

2.5.1 The exploratory experiment:

The exploratory experiment was carried out on Wednesday (17/7/2019) on (4) players of Al-Dhuluiya sports club; they were selected out of the main research sample

2.5.2 The pre- Tests

The researchers carried out the pre- tests on the research sample on 19-20/7/2019 within the same conditions related to the tests and the way of carrying out the tests for trying to have the same conditions during the post- tests.

2.6 The training Approach:

The researchers prepared special exercises( for special training, see appendix 1), which aim to improve the kinetic compatibility and fitness and their reflection on the performance accuracy of serving and star trek skills in volleyball within a training period about (8) weeks, on (Saturdays, Sundays, Wednesdays) of every week, at the rate of (3) training units per week, the total number of training units was (24) units, and the time of exercise application ranged between (55-65) minutes of the training unit time. The researchers used a ripple of weights (1-2), which means a light weight for a day followed by two days of heavy weight, as well as, the use of high-intensity interval training method. The
experimental group used the special exercises approach prepared by researchers, and the control group used the method used by the team coach.

3.6.3 The post-tests

The sample post-tests were carried out on the sample members and on the research groups on 22-23/9/2019 just as the pre-test that was carried out.

3.7 The Statistical Means

The statistical bag "spss" was adopted in figuring out the results, the percentage, arithmetic mean, standard deviation,(t) law for symmetric samples,( t) law for asymmetric samples.

3. Introducing, analyzing, and discussing the results:

3.1. Introducing and analyzing the results of the post-tests for the research groups, the control and the experimental, within the research variables in volleyball

3.1.1. Introducing and analyzing the results of the research variables tests in volleyball for the control group as shown in table (1)

Table (1): Shows the results of the pre- and post tests for the control group in compatibility, fitness and the accuracy of serving and star trek skills in volleyball

<table>
<thead>
<tr>
<th>Statistical significance</th>
<th>degree (Sig)</th>
<th>Calculated(t)</th>
<th>Post test</th>
<th>Pre-test</th>
<th>Measuring Unit</th>
<th>Tests</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>n</td>
<td>h</td>
<td>n</td>
<td>h</td>
</tr>
<tr>
<td>(⁎) significant</td>
<td>0.049</td>
<td>2.594</td>
<td>0.327</td>
<td>8.575</td>
<td>0.551</td>
<td>9.196</td>
</tr>
<tr>
<td>significant</td>
<td>0.002</td>
<td>5.675</td>
<td>0.345</td>
<td>6.531</td>
<td>0.487</td>
<td>7.065</td>
</tr>
<tr>
<td>(⁎) significant</td>
<td>0.002</td>
<td>5.966</td>
<td>0.816</td>
<td>12.333</td>
<td>1.048</td>
<td>10.500</td>
</tr>
<tr>
<td>significant</td>
<td>0.004</td>
<td>5.000</td>
<td>0.836</td>
<td>11.500</td>
<td>0.752</td>
<td>9.833</td>
</tr>
</tbody>
</table>

(⁎) significant when the significance level < 0.05

4.2 Introducing and analyzing the results of the research variables tests in volleyball for the experimental group as shown in table (2)
Table (2): Shows the results of the pre- and post tests for the experimental group in compatibility, fitness and the accuracy of serving and star trek skills in volleyball.

<table>
<thead>
<tr>
<th>Statistical significance</th>
<th>degree (Sig)</th>
<th>Calculated (t)</th>
<th>Measuring Unit</th>
<th>Tests</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Pre-test</td>
<td>Post test</td>
<td>Pre-test</td>
</tr>
<tr>
<td></td>
<td></td>
<td>n</td>
<td>h</td>
<td>n</td>
</tr>
<tr>
<td>significant</td>
<td>0.001</td>
<td>3.894</td>
<td>0.544</td>
<td>7.800</td>
</tr>
<tr>
<td>significant</td>
<td>0.004</td>
<td>4.940</td>
<td>0.219</td>
<td>5.868</td>
</tr>
<tr>
<td>significant</td>
<td>0.000</td>
<td>7.81</td>
<td>0.547</td>
<td>13.500</td>
</tr>
<tr>
<td>significant</td>
<td>0.003</td>
<td>5.270</td>
<td>0.816</td>
<td>13.333</td>
</tr>
</tbody>
</table>

*significant when the significance level < 0.05*

3.3 Introducing and analyzing the results of the post- tests for the control and experimental group in the research variables in volleyball as shown in table (3)

Table (3): Shows the results of the post- tests for the control and experimental group in compatibility, fitness and the accuracy of serving and star trek skills in volleyball.

<table>
<thead>
<tr>
<th>Statistical significance</th>
<th>degree (Sig)</th>
<th>Calculated (t)</th>
<th>Measuring Unit</th>
<th>Tests</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Pre-test</td>
<td>Post test</td>
<td>Pre-test</td>
</tr>
<tr>
<td></td>
<td></td>
<td>n</td>
<td>h</td>
<td>n</td>
</tr>
<tr>
<td>significant</td>
<td>0.001</td>
<td>2.989</td>
<td>0.544</td>
<td>7.800</td>
</tr>
<tr>
<td>significant</td>
<td>0.003</td>
<td>3.971</td>
<td>0.219</td>
<td>5.868</td>
</tr>
<tr>
<td>significant</td>
<td>0.001</td>
<td>2.907</td>
<td>0.547</td>
<td>13.500</td>
</tr>
</tbody>
</table>
Table (3) shows the values of the arithmetic mean, standard deviation the calculated (t) value, (sig) degree of the post-tests for the research groups in variables of compatibility, fitness and the accuracy of serving and star trek skills in volleyball, where the results indicate that there are significant differences between the results of the post tests for research sample in favor of the experimental group.

3.6 Discussing the post tests results for the research groups, the control and the experimental, in the under- study variables in volleyball

Through what has been shown in table (3) of the post tests results for the research groups, the control and experimental, which indicate that there are significant differences in favor of the experimental group in all research variables. The researchers attribute the significant differences to the perfect use of the special exercises prepared by the researcher who depended on tools, means that fit the players' levels in the experimental group, which adopted the appropriate duplications and intensities. This is consistent with what (Schmidt, A. Richard, 2000, p: 206) referred to” the coaches should encourage the learners to perform as many attempts as possible”, as well as, diversity in using the compound exercises in the training units, considering the appropriate periods for break between the exercises and the exercise groups according to the volleyball character. This was assured by (Robert N, Singer, 1982:227)” the kinetic skill can't be achieved without an acceptable level of special physical abilities.” This is consistent with what (Essam Abdel Khalek, 2005:127) has mentioned” exercises warm up the individual to practice the sports activity and improve the kinetic abilities required for this activity till the individual's performance of kinetic and tactical aspects improved. This has contributed in improving the players’ levels as it involves exercises characterized by appropriate and various duplications. This was confirmed by (Emad El-Din Fattah, 157 2001) "using exercises is similar to the skill performance as it contributes significantly in improving the kinetic skills performance”. This is consistent with the opinion of (Mufti Ibrahim Hamada, 1994: 23)” the players can perform the skill automatically by permanent duplication based on a correct and coherent scientific basis that are consistent with the player's levels and their ability to concentrate on the performance speed which has a great role in elevating the players' levels physically and skillfully. This is consistent with the opinion of (Mohammed Abdel Dayem, 1985:136)”the technical training programs organized according to scientific basis, improve the physical and skillful levels of the players”, as well as, using a training loads scientifically, has a great importance in improving the performance level. This is consistent with the opinion of (Faten Mohammed Rashid, 1999: 33)” selecting the appropriate exercises related to the physical abilities of the activity, contributes in elevating to the highest performance level”; rather than, graduating from the simple to the compound when performing the special exercises, helps in improving
this quality, as (Essam Abd Al-khaliq, 1999: 184) mentioned" The more fitness an individual has, the quickly his level improves".

4- Conclusions and Recommendations

4.1 The Conclusions:-

1- There are significant differences between the pre- and post- tests for the research groups in all the research variables in favor of the post- tests

2- Improving the kinetic abilities has a positive impact on improving the accuracy of the star trek skill in volleyball

3- Improving the kinetic abilities has a positive impact on improving the accuracy of the serving skill in volleyball

4.2 The Recommendations:-

1- Emphasize on volleyball spikers to pay attention to physical and skillful abilities.

2- Emphasize on the volleyball spikers to perform the physical and skillful tests to ensure the effectiveness of the used training approaches.

3- It’s necessary to perform similar studies that are similar to other physical abilities and skills in volleyball.

Arabic and Foreign References:-

1- Abu El-Ela Ahmed Abdel-Fattah; Physiological bases of the sports Training, 1st edition (Cairo, Dar Al-Fikr Al-Arabi, 1997)

2- Nagah Mahdi Shalash and Mazen Abdul Hadi; Principles of kinetic learning, Najaf Ashraf, (Dar Diaa for printing and publication, 2010)

3- Wajih Mahjoub; Kinetic Learning, Mosul (Dar Al-Fikr For Printing and Publishing, 1989)


5- Faten Mohammed Rashid; speed of kinetic response and explosive force of the muscles of the lower limbs and their relationship to some basic skills and some functional variables of volleyball players (Ph.D. thesis, College of Physical Education, University of Baghdad, 1999).

6- Essam Abdel-Khalek; sports training, 9th edition, (Baghdad, Dar Al-Maaref 1999).
7- Essam Abdel-Khalek; sports training theories - applications, 12th edition, (Cairo, Mnshia Al-Maaref, 2005)

8-Ali Salloum Jawad al-Hakim: tests, measurement and statistics in the field of sports (Qadisiyah, University of Qadisiyah, 2008).


10-Mohamed Mahmoud Abdel Dayem, impacts of a proposed program on developing the basic skills of young people in basketball, Volume II, International Conference Research, High Levels Sport, Cairo, 1985.


12-Mufti Ibrahim Hammad; new skillful and tactical preparing of the football player (Cairo, Dar al-Fikr al-Arabi, 1994)


14-Mohammed Hassan Allawi and Mohammed Nasruddin Radwan; measurement in education and sports psychology (Cairo, Dar al-Fikr al-Arabi, 2000)

15- Mohammed Hassan Allawi and Mohammed Nasruddin Radwan; kinetic performance tests, 1st edition(Cairo, Dar al-Fikr al-Arabi, 2001)

16-Mohammed Sobhi Hassanein; Measurement and Evaluation in Physical and Sports Education, 3rd edition (Cairo, Dar Al-Fikr Al-Arabi, 1995)

17-Mohammed Abdallah Mahibis; the impact of an educational curriculum using sequential and random exercise in the development of kinetic compatibility and the development of the performance of skills of star trek and the block in volleyball for junior (Master Thesis, University of Basra, College of Physical Education, 2012).


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Appendix (1)

A Training Unit Model

The number of the players: (6) players

Training type: periodical and high-intensive

The training aim: improving the compatibility-fitness

The Place: Al-Dhuluiya sports club

The total time of the training unit: 52 minutes

<table>
<thead>
<tr>
<th>The desired intensity %</th>
<th>Breaks between groups</th>
<th>Number of groups</th>
<th>Training Maximu m time</th>
<th>The exercise's purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>70 s</td>
<td>36 s</td>
<td>2</td>
<td>18 s</td>
</tr>
<tr>
<td></td>
<td>70 s</td>
<td>36 s</td>
<td>2</td>
<td>18 s</td>
</tr>
<tr>
<td></td>
<td>80 s</td>
<td>40 s</td>
<td>2</td>
<td>20 s</td>
</tr>
</tbody>
</table>

Holding the ball from the top, then holding it and walking till crossing the net, then
<table>
<thead>
<tr>
<th>%80</th>
<th>80 s</th>
<th>40 s</th>
<th>2</th>
<th>6</th>
<th>20 s</th>
<th>running to the end of the court</th>
</tr>
</thead>
</table>