A COMPARATIVE ANALYTICAL STUDY OF SOME BIOKINEMATICAL VARIABLES FOR THE OPEN AND STRAIGHT TKATCHEV SKILLS ON HORIZONTAL BAR

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Abstract

The problem of the research is that there is a weakness in the level of performance of the skill of (Tkatchev) among the players of the national youth team, and this weakness comes as a result of technical errors in the skill performance and this is what prompted the researcher to study and analyze the biokinetic variables and improve the motor path of the players through special exercises on the proposed multi-stage device. The proposed axial, which in turn corrects the motor path of the players by developing the values of some biokinetic variables. All of this prompted the researcher to design exercises to work on clarifying and understanding the motor path of the players by providing the player from the beginning with a clear and integrated kinetic and mechanical sense and perception of performance. All stages of performance with special exercises to teach the skill, as well as providing the element of safety and security for the learner in the main and closing sections and avoiding the failures and falls that he is exposed to through the motor performance of the skill performed.

1-1 Introduction and importance of research:

Gymnastics is one of the sports that has developed significantly in recent years, and this is evident through the great progress witnessed by the motor skills of this sport and the upgrading of motor difficulties year after year. Training processes, as breaking records and developing achievements is a feature of this era,
and performance in gymnastics has reached the point of miraculous Ness, the best evidence of these developments.

The biomechanical analysis in gymnastics clarifies scientific matters that were not included in the daily accounts, whether for the player, coach or scientific sports institutions, as the level of achievement depends on the level of scientific knowledge of the objectives of biomechanical analysis as a science that reveals the wrong motor paths and the levels of poor motor performance in various sports fields.

The importance of the research lies in the development of corrective exercises to learn the performance of the skill of detection on the pull-up device, depending on the typical values of some kinematic variables of the model. And all of this because of the great importance of the skill of Altkachev in achieving one of the special requirements on the pull-up device (the second group), as it is of difficulty (c) and the possibility of upgrading the difficulty to the difficulty of (f).

1-2 Research Problem: -

The skill of picking up is one of the special requirements (kinetic aggregates) on the pulley device, and it is one of the movements of leaving and holding that is characterized by its difficulty and danger. Hence the problem of the research in the difficulty of learning this skill because of its danger as it leads to a high height of more than three meters from the ground because the skill performance is to cross the crossbar from the top with the possibility of failure to re-grab again. Because the skill of tagging is one of the movements of leaving and holding on the pull-up device, and this is what prompted the researcher to develop corrective exercises based on the typical values of some kinematic variables, not the disease of the model, in order to correct the motor path of the sample members in performing the tagging skill.

1-3 Research Objectives: -

1- Identifying some of the kinematic variables of one of the global players (the model)
2- Putting corrective exercises to teach the skill of tagging on the pull-up device according to some specific kinematic variables from the model.
3- Recognizing the effect of corrective exercises on the performance stages of the discovery skill.

1-4 Imposing search:

1- Corrective exercises have a positive effect in improving some of the kinematic variables for the skill of Altachief on the pull-up device.

1-5 Research Areas:-

1-5-1 The human range: the national team players in gymnastics for youth aged (14-16 years).

1-5-2 Time range: 12/19/2020-15/8/2021.

1-5-3 Spatial range: The gymnastics training center hall in Al-Amana Sports Club - Baghdad.

3- Research methodology and field procedures:

The researcher chose the experimental method by designing equal groups with two tests, pre and post tests, to suit the nature of the problem.

3-2 The research community and its sample:

The research community was determined by the national team players in the artistic gymnastics for young people, and they numbered ten players, aged (14-16) years. As well as one of the world champions on the pull-up device, the sample was chosen randomly and numbered (8) players, and they were divided by lot into two control and experimental groups with four players for each group.

3-3 Equivalence of the two research groups:-

In order for the researcher to return the differences to the experimental factor, the research groups must be completely equivalent in all circumstances and variables except for the experimental variable that affects the research groups.

The researcher verified the equivalence of the two research groups in the variables related to skill performance and biokinetic variables through the cardiac test of the two research groups.

Table (1)The equivalence of the research sample
<table>
<thead>
<tr>
<th>Statistical significance</th>
<th>value (j) tabular</th>
<th>Value Mann witne</th>
<th>Experimental</th>
<th>Vernal Deviation</th>
<th>mediator</th>
<th>control</th>
<th>Vernal Deviation</th>
<th>mediator</th>
<th>statistical indicators</th>
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<td>Angular velocity of flight</td>
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<td>Total Performance Time</td>
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<td>16</td>
<td>74.5</td>
<td>Height Center of Body Gravity</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

significant Value (O) 1 6 0.95 3.85 Skill (Detectives)

3-4:- Means, tools and devices used:-
Arab and foreign sources
Observation and experimentation
Computer software and applications
Tests and Measurements
Information release form
- International information network
- kinetic analysis

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4591
- Camcorder (casio) type (1) Japanese-made
- Acer computer (laptop)
- Drawing scale
- Tripod (1)
- Projector
- Iron bracket (1)
- External memory (86)
- Legal Aqala device
- Gymnastics rugs
- Sponge hole.

3-5 field research procedures:
3-5-1 Analysis of the stages of the discovery skill:
In order to control the variables related to the tactics skill, the researcher divided the skill into three stages and for all players, as follows:
First: The first stage: from the moment the stretching begins to the moment the kidnapping begins. And be in the first and second quarter.
Second: The second stage: from the moment the kidnapping begins to the moment the kidnapping stops. It takes place in the third and fourth quarters.
Third: The third stage: from the moment of abandonment to the moment of grasping. It takes place in the fourth and first quarters.

3-5-2 Determination of kinematic variables
The researcher identified the following kinematic variables: The biokinetic variables for the research were identified and selected based on the opinions of the scientific committee.
First: Angle variables:
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1- Angles of the joints of the body:

The angles of the joints of the body were measured in the three stages using the kinetic analysis program (Kenova), as follows:

A- Knee angle: It is the angle between the thigh line and the leg line.

b- Hip angle: It is the angle between the torso line and the thigh line.

c- Shoulder angle: It is the angle between the trunk line and the humeral line.

2- Other angles:

A- Angle of leaving: It is the angle between the line joining the point of connection of the palm of the bar (the bar) to the point of the hip, with the horizontal line passing through the bar. It is measured against the player's body. It was measured in the fourth quarter.

b- Angle of grip: It is the angle between the line joining the point of connection of the palm of the bar (the bar) to the point of the hip, with the horizontal line passing through the bar. It is measured against the player's body. It was measured in the first quarter.

Second: Speed Variables:

1- Angular velocity of hijacking: is the angular movement of a given point divided by the time of travel.

2- Angular velocity of flight:

Third: the maximum height of the center of gravity of the body above the crossbar

Fourth: Time Variables:

1- Flight time

2- Total performance time
3-5-3 Videography:

The detection skill was filmed using a Japanese-made Sony video camera with a speed of (1200 images / sec), as the camera was used at a speed of (300 images / sec), where the camera was placed sideways to the pole and was installed on a tripod with a height of (2 m) from the focus of the lens to ground. The distance between the pole and the side beam of the bar was (6 meters) perpendicular to the movement. The scale was photographed in the photographic sector (1m).

3-6 Preliminary skill test

The researcher gave two educational units for the skill before taking the pre-test 11/4/2021 in the gymnastics hall of Al-Amanah Sports Club, and the performance of the skills of Altkachief was evaluated by four international judges*

3-7 The main experience:

The researcher conducted the main experiment on 4/12/2021 after knowing the results of the pre-test. The main experiment included the application of corrective exercises for the experimental group and for the main section only. The experiment lasted (8) weeks with (3) educational units per week, and (24) educational units were applied with a time of (2160) minutes, and the time allocated for corrective exercises was (35) minutes, while the control group was working according to the curriculum of the trainer's style.

3-7-1 Corrective exercises to learn the skill of detection:

1- Weighted performance with Anderson's work (on the low bar)

2- From the back rotation, perform a curved rear air kiss (Pike) in order for the player to feel the kidnapping and stop the kidnapping with the process of leaving.

3- Performing the rotation on the high bar (above the spongy hole), then leaving the bar and crossing it towards the back with a mat placed on the bar by the coach.

4- The player stands in front of the small horse (the pony), so that the player gives his back to the horse and then jumps back and crosses it openly.
5- Performing the Kachiv movement by holding the bar again (on the high bar).

6- Performing a full kachiv movement.

3-8 Post-test:

After the researcher finished the main experiment, he conducted the post-test for the two research groups on 6/10/2021, noting that the test was conducted under the same conditions as the pre-test.

3-9 Statistical means:

The researcher used the following statistical methods:

1. broker
2. quartile deviation
3. wolcoxen
4. Man Whitney
5. ka2 good match

4- Presentation, analysis and discussion of the results

4-1 Presenting, analyzing and discussing the results of the biokinetic variables of the skill of Altkachev on the pull-up device.

4-1-1 Presenting the results of the biokinetic variables for the skill of the detection on the pull-up device for the research sample (before - after) for the control group, analysis and discussion.

Table (2) It shows the median, quartile deviation, and wolcoxen values for the control group

<table>
<thead>
<tr>
<th>Significance</th>
<th>calculated value (f)</th>
<th>after</th>
<th>before</th>
<th>unit</th>
<th>Variables kinematics</th>
<th>Quarter</th>
<th>Phase</th>
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<td>175.5</td>
<td>mark</td>
<td>Knee angle</td>
<td>first</td>
<td>stage</td>
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<td>Mark</td>
<td>Hip angle</td>
<td>Shoulder angle</td>
<td>Knee angle</td>
<td>Second Stage</td>
<td>Third Stage</td>
<td>Fourth Stage</td>
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</tbody>
</table>
4-1-5 Discussion of the second stage in the third and fourth quarters (before - after) experimental

The results in table (2) showed that there are significant differences in the biokinetic variables in favor of the experimental group at the expense of the control group, and the researcher attributes this to the designed device and the exercises. The exercises used on the device have a role in increasing the interaction of the experimental group and breaking the traditional learning routine. In the hip angle variable, we notice that the player bends the hip angle in the snatch stage during the third quarter (note that the snatch may start before reaching the deep point under the bar) to reduce the torque. Inertia and an increase in the angular velocity of the body as a result of bringing the center of gravity of the body closer to the axis of rotation and converting the amount of potential energy to a quantity of kinetic energy through muscle strength, and thus the body overcomes the force of gravity and the movement of the body continues upwards. At the moment of launch, in which the player moves towards the top from the position of vertical attachment below the beam until the moment of liberation or leaving and launching from the bar beam, the player tries to conserve as much as possible of the acquired energy, which is divided between transitional energy and rotational energy in the next stage, which is the stage of flight in order to. He can complete the movement by holding the crossbar again.
References


