International Journal of Physical Education, Sports and Health 2023; 10(2): 317-320

P-ISSN: 2394-1685
E-ISSN: 2394-1693
Impact Factor (RJIF): 5.38
IJPESH 2023; 10(2): 317-320

www.kheljournal.com
Received: 18-01-2023
Accepted: 28-03-2023

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The effect of using exercises with auxiliary tools for unstable jumping on the balance of strength and explosive ability of the muscles of the two legs of football players under 19 years old

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DOI: https://doi.org/10.22271/kheljournal.2023.v10.i2e.2878

Abstract
The purpose of this paper was to preparing exercises with auxiliary tools for unstable jumping in the balance of strength and explosive ability of the muscles of the two legs for football players under 19 years old, and to identify the effect of exercises with auxiliary tools for unstable jumping on the balance of strength and explosive ability of the muscles of the two legs of football players under 19 years old. The researchers used the experimental method in a single interrelated sample method, due to its suitability to the nature of the problem and the objectives of the research. The researchers selected the research community from the players of the second-class clubs in Wasit Governorate, and the research sample was deliberately chosen from the research community, which is the players of Al-Kut Sports Club, and 10 players from the club were chosen to apply the research procedures to them as well as the experiment, and the goalkeepers were excluded from participating in the training. One of the most important results reached by the researcher is that: Strength training with unbalanced tools contributed to the development of the variables of force balance and explosive power, unbalanced strength training has a significant impact on strengthening the neuromuscular reflexes of the muscles surrounding the ankle joint, and training with unbalanced jumping exercises mobilizes the largest amount of muscle fibers to give a high explosive character. One of the most important recommendations recommended by the researchers is that: Emphasis on the use of these exercises to give the players an explosive and effective character, use of these exercises as strength exercises and preventive injuries of the ankle joint , and work on the inclusion of exercises similar to non-sports games that use the explosive character in their movements.

Keywords: Auxiliary tools, strength balance, explosive ability, football

Introduction
The training process is a process based on renewal and diversity in training methods and training thought within the used training method, and this renewal did not come arbitrarily, but rather by searching for solutions to ongoing training problems, and this is what made the development wheel progress in sports internationally is continuing as a result of studies that are still following its progress in all aspects in order to obtain the best means and training methods that achieve the best achievement in sports performance.

Football is one of the sports that tops the list of the most followed games and the most financial return, whether for players, coaches or sponsoring companies, and this is what made the direction and endeavor of researchers and coaches to develop the reality of the game, whether at the level of organization or the level of qualification and improving the physical capabilities of the athlete, which will reflect positively on continuing to perform the skills successfully for as long as possible during the time of the matches.

All skills in the game of football require a high level of physical capabilities, but in certain proportions according to the playing situation. Some skills require motor speed in performance, and some depend on explosive ability to achieve the goal of the skill.

When performing most skills, high levels of strength are required for the muscles involved in the performance, as well as balance muscle that reduces injury as a result of distributing the load on muscle groups and not on a specific muscle, and this matter requires training programs in which the side of preserving the athlete's muscles and joints from injury is done through training means, and here the importance of the study emerges by activating the training aids after performing the muscle effort Working muscles sense the effort and unstable strength on the periphery of the joints.

Research problem

The reality of football globally is subject to a system of basic principles that accompany the training process, whether the athlete's nutrition, the use of rapid recovery means, or the use of preventive means from injuries, etc., and this is what we did not find in the reality of football locally, as the sovereignty of the training process is in the field in a way Completely, and this prompted the researchers to pay attention to an important matter, which is despite the use of high training in the training units now that playing we find in matches is injured after performing a skill with high strength, whether after jumping or camouflaging and changing direction, and this prompted the researchers to use auxiliary training methods that enter additionally to the exercises within training modules, we hope to be a means to address this problem.

Research objective

- Preparing exercises with auxiliary tools for unstable jumping in the balance of strength and explosive ability of the muscles of the two legs for football players under 19 years old.
- To identify the effect of exercises with auxiliary tools for unstable jumping on the balance of strength and explosive ability of the muscles of the two legs of football players under 19 years old.

Research hypotheses

- There are statistically significant differences between the pre and post-tests in the research variables and in favor of the post-tests.

Research fields

- Human field: A sample of Wasit Governorate football clubs.
- Time field: (2/10/2022) to (7/2/2023).
- Spatial field: Al-Kut Olympic Club Stadium.

Research methodology and field procedures

Research Methodology

The researchers used the experimental method in a single interrelated sample method, due to its suitability to the nature of the problem and the objectives of the research.

Community and sample research

The researchers selected the research community from the players of the second-class clubs in Wasit Governorate, and the research sample was deliberately chosen from the research community, which is the players of Al-Kut Sports Club, and 10 players from the club were chosen to apply the research procedures to them as well as the experiment, and the goalkeepers were excluded from participating in the training.

Means of collecting information

- Arabic and foreign sources
- International Information Network (Internet)
- Tests and measurements
- Observation and experimentation
- Statistical means

Devices and tools used in the research

- Balance balls
- Half a balance ball
- Plastic cylinders with a diameter of 4 inches
- Jumping boxes of different heights
- stopwatch
- HP computer
- 2 cameras
- Electronic scale
- wooden planks

Field research procedures

Identifying the biomechanical variables under study

After reviewing previous studies, scientific sources, and the experience of the two researchers, two variables were identified for their study, and they are considered the most important to solve the research problem according to the researchers' view:

- Balance of strength
- The explosive ability of the muscles of the legs.

Identifying search tests

After determining the biomechanical research variables, the appropriate test was chosen for each variable according to recent studies:

Balance test (Level1) (Najah and Thamer. 2015) [5]

- Aim of the test: measuring balance and its variables.
- Tools: Challenge-Disc, Computer.
- Performance method: The player stands on top of the Challenge-Disc device and faces the computer, as two circles appear in each stage of level (1), and the player must enter the small circle inside the large circle by moving the disk and with the help of looking by watching on a screen The computer is as shown in Figure (6), and the performance method differs after each attempt until it reaches stage (13), which is the last stage, and the time of each stage is (0.35) seconds.
- Recording: The device gives a percentage for each stage of the performance; its unit is the degree, in addition to the degree of total balance.
- Number of attempts: One attempt is given to each player after making trial attempts to adapt to the test requirements, and the test time is (5) minutes.

Fig 1: Shows the balance device and how to stand on it

After completing the test, the test screen shows the total degree of balance, which is extracted through (13) variables for balance (3) of which are for fixed balance, which are in the order of variable (1, 2, and 3) and (10) for mobile balance, which is in order from variable (4 to 13) As shown in the figure (2):

Fig 2: Shows the extracted balance variables

Explosive strength test by jumping up with a footscan (Majid. 2016) [3]

- Aim of the test: measuring the vertical explosive strength of the two legs muscles.
- Unit of measure: Newton
- Tools: calculator, strength measurement platform foot scan
- Description of the performance: The tester stands on the strength measurement platform with the feet parallel and wide open to the width of the pelvis from the position of half-bending the knees, and performs swinging with the arms - backwards, and then performs the jumping process for the highest vertical distance.
- Recording: Each athlete is given three attempts to record the highest strength recorded by the laboratory between one attempt and the other, 30 seconds

Static jump test

The static jump test is an advanced version of the global (Sergent) test, which has been used so far to measure the explosive strength of the two men, and in general, the static jump test of the system is more reliable in measuring vertical height compared to the Sergent test, as the Sergent test It is affected, even to a small degree, by the work of the arms, as the pointing is done with one of the arms, in addition to that raising one of the arms up while the other arm is down, will change the location of the center of gravity of the body and lead to an imbalance in the jumping mechanism, which affects the height of the jump. The indicator, the system will measure the height of the jump vertical.

Exploratory experience

The experiment was conducted on (2) individuals from the research sample, on 5/11/2022 at ten o'clock in the morning and on 6/11/2022 at four o'clock in the afternoon, at the Al-Kut Olympic Stadium. The aim was:

- Know the maximum repetitions for each exercise.
- To know the time spent for each exercise and the time of work and rest.
- Make some modifications to the exercises to increase the accuracy of their objective.

Pre-tests

The pre-tests were conducted on 8/11/2022 at four o'clock in the evening at the Al-Kut Olympic Club stadium, and the research test was the balance test on the balance hemisphere device, as well as the vertical jump with both feet with the foot scan device, and on all members of the research sample.

Main experience

The main experiment started on 10/11/2022 and ended on 14/1/2023, when the two researchers applied the proposed jumping exercises on unbalanced surfaces and tools, and the researchers were keen to apply one exercise correctly according to the required motor performance of the players before starting to perform the exercise. To reduce the risk of performing the exercises, but after less than a month has passed since the exercises, the players began to imprint on the performance in its true form without the coach's intervention with the details of the training. The most important things that were done in the prepared exercises are as follows:

- The duration of the application of the exercises was three training units per week, at the rate of 24 training units throughout the training period prepared by the researchers and was within the main section of the training unit.
- The time of the training unit was 120 minutes, so the researchers specialized their training within 90 minutes of the main part, after taking 20-40 minutes from it, which represents the applied part of the main part, during which the exercises are implemented.
- The method of high-intensity interval training and repetitive training was chosen during the periods of the training units due to its suitability to the nature of the explosive nature of the prepared exercises.
- The researchers used the ripple 1:3 in the implementation

of the exercises.

Post-test

The pre-tests were conducted on 19/1/2023 at 3:00 pm at the Al-Kut Olympic Club stadium, and the research test was the same as the tribal test, which was the balance test on the balance hemisphere device, as well as the vertical jump with both feet on the foot scan device, and on all members of the research sample.

Statistical methods: The search data was processed through the Statistical Package for the Social Sciences (SPSS).

Results and Discussion

Presentation and analysis of the results of the pre and post-tests of the research group in biomechanical variables

Table 1: shows the arithmetic mean and standard deviations, the difference of the arithmetic mean and its standard deviation, the calculated (t) value, the significance of the differences, and the percentage of development between the results of the pre and post-tests in the researched variables

Variables	Pre-test		Post-test		Arithmetic mean of difference	Standard error of the mean difference	T value calculated	Level Sig	Type Sig
	Arithmetic mean	Standard deviation	Arithmetic mean	Standard deviation					
Explosive power	1196.100	54.993	1078.400	72.562	117.70	18.586	8.332	0.000	Sig
Strength balance	111.169	2.298	103.895	3.309	7.273	0.877	8.288	0.000	Sig

Discuss the results of pre and post-tests in biomechanical variables

Through the data in the above table, it was found that there is a clear development among the research sample through the sig result of the two tests, and the researchers attribute the reasons for the development of the research sample as a result of applying the exercises according to the instructions of each exercise and according to the path of movement and on the same repetitions and attention to the details of the interstitial comfort, which had a clear effect in controlling the exercises And its effectiveness, as well as the course of the exercise is unfamiliar to the player, due to the lack of stability and stability of the player in general and the ankle joint in particular, which increases the burden on the central nervous system, which makes the muscle mobilize the largest muscle contraction to maintain stability after explosive power, and this is indicated by (Hasan, B. B. 2021) [1] (Al-Hawari. 1994) [2]. There are two ways to develop capacities and abilities by increasing the speed of muscle contraction.

As for the explosive power variable by jumping up on the foot scan, the results were significant between the pre-test and the post-test rather, in addition to the exercises, the mobilization of the neuromuscular instructions and responses as a result of the instability of stability during the production of muscle power, and this made a functional development in the working muscles as a result of the gradual use of new loads on the players. This is what pointed out: "Training with a new and appropriate overload needs to be gradual in the training load, and it is an example of the principle of gradual progress." (Qatt: 1999) [4] (Hasan, B. B., & Hasan, A. A. 2022) [1, 6].

Conclusions and Recommendations

Conclusions

- Strength training with unbalanced tools contributed to the development of the variables of force balance and explosive power.
- Unbalanced strength training has a significant impact on strengthening the neuromuscular reflexes of the muscles surrounding the ankle joint.
- Training with unbalanced jumping exercises mobilizes the largest amount of muscle fibers to give a high explosive character.

Recommendations

- Emphasis on the use of these exercises to give the players an explosive and effective character
- Use of these exercises as strength exercises and preventive injuries of the ankle joint
- Work on the inclusion of exercises similar to non-sports games that use the explosive character in their movements.

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