The Effect Of (Physical - Technical) Exercises Using The High-Intensity Stations Method In Raising The Level Of Strength Characterized By Speed, Flexibility And Achievement For Junior High Jump Players

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Abstract

Study purpose. The performance of high jumpers is not currently meeting desired achievements, with progress stagnating despite physical development. This discrepancy is believed to stem from a weaker focus on developing motor abilities, such as flexibility, in comparison to physical training. Flexibility training, incorporating a variety of exercises, is hypothesized to be a critical component for enhancing the specific motor skills required for high jumping. Therefore, this study aimed to identify the effect of a structured flexibility training program on the level of selected motor abilities and high jump achievement in participants aged 12-14 years.

Materials and Methods. The study likely involved a sample of participants aged 12-14, who were probably divided into an experimental group and a control group. The experimental group underwent a supervised flexibility training program featuring varied exercises, while the control group continued with their standard training regimen. Key motor abilities relevant to high jumping (e.g., flexibility, agility, balance) and high jump achievement (measured by jump height) were assessed for all participants before the intervention (pre-test) and after its completion (post-test). Statistical analysis was then used to compare the improvements between the two groups.

Results. The results demonstrated that the group which participated in the flexibility training program showed significant improvements in the measured motor abilities and in their high jump performance compared to the control group.

Conclusion, flexibility training is a successful intervention for raising the level of key motor abilities and enhancing achievement in the high jump for individuals aged 12-14 years. It is therefore recommended that coaches and trainers adopt structured flexibility training as an integral component of athletic development programs for young high jumpers.

Keywords: Exercises (physical-technical), Stations method, Strength characterized by speed, Flexibility, High jump.

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Introduction

Planning based on logical and scientific thinking helps to improve and progress in all fields because it is a factor that helps to put the names in their proper and purposeful position (Antal et al., 2023). through which the planned goal can be achieved, and this includes the educational, social, sports, and other important aspects for humans (Hall & Holt, 2023). In the field of sports, proper planning plays an important and essential factor in building an athlete in terms of training, which helps in integrating the necessary qualities, whether physical or motor, in achieving sports achievement in various sports (Khazaal, 2025). Here, it becomes clear to us for each sports game that has physical and motor requirements that help to make sports achievement (Christiani et al., 2021). One of these sports is the athletics, which is one of the sports with suspense and excitement in the event of obtaining the advanced achievements (Karasievych et al., 2021). Which requires training planning for this event, and needs highly flexible training, that is, high training with flexibility for the necessary joints in the crossbar of all the joints of the body and the largest of the trunk, which needs exercises that elevate this physical ability and reflect it on the motor abilities (Syahruddin et al., 2022).

Flexible training is "one of the exercises that focus on improving the range of motion and flexibility in muscles and joints, for examples of this training are yoga and ballistic exercises, which reduce the risk of injury and raise the level of athletic performance and increase physical fitness" (Guo, 2022). Plisky believes that "the term motor abilities "is used to denote the performance competence of basic motor skills and skills associated with a specific sports activity ,it has many components (compatibility , agility , accuracy , balance)" (Plisky et al., 2021).

Przybylski believed motor abilities as “playing an essential role in practicing various motor activities that considered the cornerstone from which the individual begins to start towards practice and then excellence and achievement (Przybylski et al., 2021). Motor abilities represent a known system that can be divided into physical abilities and consensual abilities, where physical abilities include endurance, strength, agility, speed and flexibility, while motor abilities also include speed, neuromuscular compatibility, under the pressure of throwing and motor accuracy"(Mödinger et al., 2022). In light of this, we have shown the role and importance of motor abilities in the sports aspect and the extent of their relationship with each other, especially with flexibility in achieving the advanced level (Ihsan et al., 2023). The importance of research using appropriate training that enhances the motor aspect, especially flexibility exercises accompanying performance and other motor abilities for the purpose of upgrading the level of players in the high jump and making the required achievements.

High jump performance in young athletes often falls short of its potential because training focuses more on general physical conditioning than on crucial motor skills like flexibility and balance (Shareef, 2025). This study will investigate whether a targeted flexibility-training program can improve these skills and boost high jump results. We hypothesize that this training will significantly enhance both motor abilities and high jump achievement for 12-14 year old athletes. The research will be conducted with high jumpers from the Basra Education Directorate at Qurna Stadium from October 5 to December 9, 2025.

Materials and methods

Study participants

She identified research community as high jump players aged (12-14) for the Basrah Governorate Education Directorate in the intentional manner, as well as the equivalence of the two groups using Test (T) for unrelated samples as in Table (1) and (2).

Study organization

For the purpose of achieving the research objectives and addressing a problem, the researcher used the experimental approach with the design of the two equal control and experimental groups, can be seen in table 1.

Table 1. shows homogeneity within each control and experimental group of the research sample in the research variables

Variables	Control group			Experimental group		
	M.	St.d	Coefficient of variation	M.	St.d	Coefficient of variation
Length (cm)	140	1.412	1.004	140.63	1.532	1.089
Weight (kg)	38.41	754	1.963	38.47	.845	2,196
Age (year)	3.142	0.241	7.67	3.214	0.241	498

Table 2. shows equivalence between the control and experimental groups in the tests used for the research sample

Kinetic Variables and Achievement	Control group		Experimental group		Calculated T Values	Sig. level
	M.	St.d	M.	St.d		
Motor Balance/sec	15.232	0.51	15.345	0.63	0.245	Insig.
Motor Compatibility/Number	40.142	0.78	40.232	0.234	0.191	Insig.
Flexibility	35.242	0.62	35.341	0.471	0.22	Insig.
Achievement /meter	1.27	0.24	1.28	0.14	0.062	Insig.

* The table 2 value of (t) at a degree of freedom of (6) and a probability of error of (0.05) is = 2.447

Means of collecting information

- Sources and References
- Tests and measurements.
- High Jump Racecourse.
- HIGH JUMP.
- Balance beam with a width of (10) cm, length of (4) m and thickness of (3-5) cm.
-Stop watch.
- Rope length 100 cm.
- Two wooden posts.
- Leather strap.

Determination of research variables

As the researcher reviewed the sources, references, and previous research, She concluded that movement abilities (motor balance, motor coordination, flexibility), and long jump achievement were important variables to address the research problem.

Tests used

1. Balance Test:
   Test Name: Beam Walking Test
   Purpose of the test: Measuring equilibrium through movement.

Tools: Balance beam with width (10) cm, length (4) m, thickness (3-5) cm, flat ground, stopwatch.

Test Specifications: In response to the start signal, the tester walks on the bar until the end, turns, and returns to the start point at maximum speed without touching any part outside the bar.

Recording: The time taken to walk on the beam is calculated to be less than 1/10 of a second. When any part of the body comes into contact with the ground outside the beam, a second is added for the time taken (Mohammed, 2024).

2. Compliance Test:
   Test Name: Jump Rope Test
   Purpose of the test: Measuring compatibility.
   Tools: A rope of 24 inches length, so that it is held from the terminal, provided that the distance between the two nodes is 16 inches (which is the distance from which it will be jumped), leaving a distance of 4 inches outside each node to be used to hold the rope .
   Performance specifications: The tester holds the rope from the specified places, he jumps over the rope so that the rope passes in front and under the feet, (repeated five times).
   Recording: Record the number of correct jumps from the five attempts made by the tester (Khazaal & Shanta, 2025).

3. Flexibility Test:
   Test Name: Touch the four rectangles.
   Test Aim: This test measures flexibility for the dynamics and speed of flexion, extension of the legs, and rotation of the spine.
   Test specification: A test that measures the dynamics and speed of flexing and extending the legs.
   Testing instruments: Two wooden posts with two rectangles fastened with a leather strap and stopwatch.
   Method of performing the test: The tester stands with the two stands on either side of him, with the arms secured by the belt. Upon hearing the start signal, the tester turns to the right and left, touches the upper rectangles, then bends his knees and touches the lower rectangles until the end of the signal within (30) seconds. As in Figure (4)
   Directions: Do not calculate counts after or before the end of the signal for (30) seconds (Guo, 2022).

Exploratory experiment

The researcher conducted a survey experiment on 5/10/2025 on the original research sample by applying some exercises for codifying them and knowing the suitability of the research sample. Pre-tests: Conducted on 12/10/2025

Flexible training used

A set of flexibility exercises has been developed for the joint of the body as well as muscle stretching exercises using different tools aimed at raising the level of flexibility and motor abilities required in the long jump.

These exercises applied in the following detail:

- Number of months: 2 months
- Number of weeks: (8) weeks.
- Number of units: (24) training units.

- Unit days: Sunday, Tuesday, Thursday.

The intensity of the exercises was (80-90%), and the size was determined according to the maximum intensity and the frequency of the performance was calculated.
- Rest: Pulse is adopted as a rest indicator (between repetitions 120-130 z/min) (between totals 110-120 z/min).

After completing the exercises in the final form and conducting the exploratory experiment on it for rationing the training load. It was programmed in the main section of the trainer's training modules, and it was applied during the special preparation period. The training started on 13/10/2025 and ended on 8/12/2025. Post-tests: Conducted on 9/12/2025

Statistical analysis

The researcher used a system (SPSS) version 25, to process the research data.

Results

Results of pre and post-tests of the control group in physical tests:

Table 3. Shows the pre and post means, standard error, and calculated T tabular values of control group in the tests used

Kinetic Variables and Achievement	M. Pre	M. Post	Standard Error	Calculated T value	Sig. level
Motor Balance/sec	15.232	13.02	0.574	3.853	Sig.
Motor Compatibility /Number	40.142	42.24	0.574	3.655	Sig.
Flexibility	35.242	37.24	0.563	3.548	Sig.
Achievement /meter	1.27	1.32	0.012	4.66	Sig.

* The table 3 value of (t) at a degree of freedom of (6) and a probability of error of (0.05) is = 3.182

Table 4. Shows pre and post mean, standard error, and calculated T tabular values of the experimental group in the tests used

Kinetic Variables and Achievement	M. Pre-	M. Post	Standard Error	Calculated T Values	Sig. level
Motor Balance/sec	15.345	11.42	0.861	4.558	Sig.
Motor Compatibility /Number	40.232	44.74	1.23	3.665	Sig.
Flexibility/ Number	35.341	39.45	1.22	3.368	Sig.
Achievement /meter	1.28	1.38	0.024	4.166	Sig.

* The table 4 value of (t) at a degree of freedom of (6) and a probability of error of (0.05) is = 3.182

Table 5. Shows mean, post standard deviations, and calculated and tabular T values between control and experimental groups in tests used

Kinetic Variables and Achievement	Control group M.	St.d	Experimental group M.	Sig.	Calculated T value	Sig. level
Motor Balance/sec	13.02	0.647	11.42	Sig.	2.811	Sig.
Motor Compatibility /Number	42.24	0.76	44.74	Sig.	3.894	Sig.
Flexibility/Number	37.24	0.95	39.45	Sig.	3.143	Sig.

Achievement / meter	1.32	0.022	1.38	**Sig.** level	4.285	Sig.

* The table 5 value of (t) at a degree of freedom of (6) and a probability of error of (0.05) is = 2.447

This is evidence of the success of the exercises used for the two groups, which achieved the objectives of the training used. As show by (Ahmed Shihab Ahmed, 2024) quoting "Training methods and techniques are used to develop and improve the physical level of the player to achieve advanced sporting achievements (Karasievych et al., 2021). We do not believe that a coach can dispense with the use of these methods and techniques, which have become the basis for construction and development. The important thing about these methods is that they are used for all forms of sports of different types. The coach only has to be an artist in choosing the appropriate method for the event in which a method can be used more than the rest of the other methods (Fikret, A., Leyla, 2020).

While Nuriddinov believes that "Improving the level of sports performance is one of the indicators of the success of the training process, in order to reach the highest sports levels. The great development that has occurred in training methods is the result of the increasing interest in searching for new methods in training players and relying on scientific foundations in planning and developing training programs that make them able to improve the level (Nuriddinov, 2023) By observing Table (5), we found that the experimental group was superior to the control group due to the use of flexible training that includes stretching exercises using ballistic exercises and joint flexibility exercises using tools such as the bar, dumbbells, stick and other tools that help to stretch and raise the level of flexibility, which affects motor abilities.

Flexible training using ballistic exercises enhances stretching and increases the motor aspect, as Digham shows that "Ballistic training is of great importance in all sports events, as it is one of the factors of good performance and high achievement and is one of the important indicators of the state of physical fitness and skill" (Digham, 2022). In terms of flexibility and its role, Mahedero believes that flexibility is "the motor capacity of the joints. Muscle flexibility depends mainly on the degree of elasticity of the tissues around the joint, as there are adipose muscle tissues as well as tendons and bonds between the heads of bones. This trait depends on exercises that stretch the tissues around the joint in order to increase the motor capacity of the joint" (Mahedero et al., 2021).

Hence, the role of flexibility in motor abilities becomes clear, which helped in raising motor coordination as well as motor balance, which are two important requirements in achieving the achievement in the high jump. as Borges sees the role of motor balance as “working directly in improving the player’s resulting strength by reducing the proportions of muscles allocated to achieve stability and allowing them to contribute more driving force. It was found that it caused an increase in muscle activation by increasing the strength of muscles and joints, which reduces the consumption phase in the shortening and extension cycle of the muscle and thus improves performance” (Borges et al., 2022). Regarding the motor coordination is defined by (Xu, 2022) “From a physiological perspective, coordination (Xu, 2022) In terms of high jump achievement, "doing exercises, developing the necessary requirements for effectiveness, using flexibility, and special exercises derived from the effectiveness of specialization, along with selected exercises, increases the improvement of neuromuscular coordination when performing effectiveness with high strength, which leads to achieving high achievement" (Khazaal & Shanta, 2025).

Conclusions

Flexible training is one of the successful exercises in raising the level of some motor abilities and achievement in the high jump at (12-14) years. Flexibility is one of the physical

qualities necessary to raise the level of motor abilities and making achievement in the high jump as it helps to prepare the joints for work and movement in the most difficult conditions. Adopting flexible training as one of the successful trainings in raising the level of some motor abilities and achievement in the high jump at (12-14) years. Emphasizing flexibility as it is one of the physical qualities necessary to raise the level of motor abilities and making achievement in the high jump.

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Conflict of interest

The authors declare that there are no conflicts of interest.

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