

## The Effect of Assisted Training Using Supplementation (BCAA) in Developing the Special Strength and Accuracy of Offensive Skills in Volleyball for Youth

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### ABSTRACT

**Background:** The purpose of this paper is to identify the effect of assisted training using branched-chain amino acids supplementation (BCAA) in developing the special strength and accuracy of offensive skills in volleyball for youth.

**Methods:** The researchers used the experimental method in the style of the two groups (control and the experimental) due to its suitability to the research problem. The players of Al-Muqadadiya Sports Club represented the research sample, ages (18-19) years, who numbered (15) players and they were divided into two cases and control groups and for each group (6) players and (3) players, the reconnaissance experiment was conducted on them. The curriculum was applied to them for a period of two months, at the rate of (3) training units per week, where pre and post-tests were conducted, then data were collected and processed statistically with the (SPSS) program, and the results obtained

**Results:** There are significant differences in favor of the experimental group and for all special strength tests at the expense of the control group.

**Conclusion:** The supplement (BCAA) had a positive effect on improving the level of physical performance in volleyball, and the physical exercises had a positive role in the development of the accuracy of the performance of the players by using them as an aid in the training units.

**Keywords:** Assisting exercises, BCAA supplementation, and offensive skills.

### INTRODUCTION

Training and sports physiology is a tool to achieve the goals needed by the coach so that the team he supervises reaches the highest technical and physical readiness that enables him to develop all his capabilities during times of competition, and to achieve these goals, he is no longer left to random place due to good preparation using a scientific methodology aimed at developing the capabilities of the players. At all levels, and this was confirmed by Al-Shamaa, 2002 "Good preparation requires regulated training and physiological programs based on scientific foundations that take into account the principles of training science, physiology, and the nature of the practice game" <sup>(1)</sup>.

And the game of volleyball, which is one of the games that require capabilities, a high level of physical fitness that qualifies the athlete to continue in the competition, and from what we are witnessing today of great scientific and technological development in various training sciences and volleyball in particular, the researchers directed to training based on complementary exercises (BCAA) that work to develop the special strength of the working muscles during kinetic performance through Work, or performance similar to movement that has an effective effect in the direction of muscular work and that serves the physical side.

### Research problem:

Aggressive skills in volleyball are one of the keys to victory and the real measure of the level of the players and the team. Working on training and developing them requires a high level of training and physical and skillful preparation, and among the most

important elements of physical and physiological preparation are the special forces for the effectiveness of volleyball.

By informing the researchers and inquiring with some coaches and athletes in volleyball, it was seen that there is some lack of strength training for volleyball. In addition to the suffering of young athletes from strength training based on iron halls and jumping exercises in circulation, which has a lot of negative damage to the joints and bones of young players.

Therefore, the researcher sought to find exercises that help in developing the special strength by using simple tools and devices while remaining on the same performance and kinetic path during the match or exercise, with the use of a nutritional supplement based on developing this strength in a short period while giving positive results and the (BCAA) component.

It is one of the components that have proven its ability to develop special strength and increase the activity of nerve capacity, which gives the possibility of increasing the ability of players.

### Research objective:

- Identifying the effect of assisted training using supplementation (BCAA) in developing the special strength and accuracy of offensive skills in volleyball for youth.

### Research hypotheses:

- There are statistically significant differences between the pre and post-tests in the strength of the volleyball players and in favor of the post-tests.

### **Research fields:**

- Human field: 200 volleyball players in the premier league in Iraq
- Time field: (23/1/2021) to (29/1/2021)
- Spatial field: Peshmerga club hall

### **Research methodology and field procedures:**

#### **Research Methodology:**

The researchers used the experimental method in the style of the two groups (the control and the cases) due to its suitability to the research problem.

#### **Community and sample research:**

The research sample was represented by the players of Al-Muqdadiya Sports Club, ages (18\_19) years, who numbered (15) players, and they were divided into two experimental and control groups, and for each group (6) players and (3) players, the reconnaissance experiment was conducted on them.

#### **The researchers used the following tools in the research:**

- Various colored adhesive tapes.
- Measuring tape.
- Registration form and whistle.
- Weights for the two legs, number (8).
- An auxiliary training device for developing jumping power.
- Volleyball number (8).
- A net to hang the ball on the device.
- Two (2) electronic stopwatches.
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The researchers conducted the exploratory experiment on a sample of young volleyball players from the same research community from Al-Muqdadiya Club, who numbered (3) players, on Wednesday 2/16/2022.

The researchers aimed to conduct this experiment to train a team helping work in an attempt to avoid errors that may face the research experience as much as possible and to ensure the appropriateness of the exercises. And the nutritional supplement to the level of the research sample and the extent of their understanding of the vocabulary of these tests and to identify all the negatives and obstacles that the

researcher may face during the conduct of the tests. And also identifying the sufficient time to conduct the tests, as well as identifying the appropriate rest periods that can be given between one test and another, which are commensurate with the capabilities of the research sample.

The special strength exercises were applied to the experimental sample, starting on Sunday, 27/2/2022, as follows:

The duration of the curriculum is (8) weeks, and the number of units is (3) units per week (Sunday, Tuesday, and Wednesday). The exercises were applied in the main section of the training unit, with a time ranging from (25-30) minutes, and immediately after the warm-up. The control group applied the regular exercises prepared by the training staff of the sports club for the main section and under the supervision of the researcher. The number of special strength exercises (6 exercises) for the experimental group.

#### **Ethical consent:**

**Informed consent was taken from the player's relatives or the player himself when he was still conscious with keeping the player ` records confidential in all stages of the study. This work has been carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for studies involving humans.**

#### **Pre-tests:**

The researchers used reliable sources and experts in the field of volleyball tests to determine the tests for the research.

Pre-tests were conducted on all members of the experimental and control samples on Wednesday corresponding to 23/2/2022 at four o'clock in the afternoon, and the results of the tribal tests of the control and experimental groups were processed by appropriate statistical means, in order to avoid influences that may affect the research results despite The sample represents one mixture.

#### **Statistical methods**

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

Table (1) Shows the equivalence of the two groups (experimental and control) in the pre-tests of the special power.

Tests		Experimental		Control		T value	Level sig	Type sig
		Arithmetic mean	Standard deviation	Arithmetic mean	Standard deviation			
explosive power to legs	standard	1.25	0.02	1.251	0.021	0.398	0.688	Non sig
	distance	45.333	4.179	46.833	3.6	0.666	0.548	Non sig
explosive power to arms		6.007	0.308	5.92	0.353	0.199	0.824	Non sig
power Characteristic speed to legs		4.748	0.401	4.878	0.29	0.689	0.538	Non sig
power endurance to legs		15.5	2.073	16	2.607	0.459	0.652	Non sig

Through table (1), which shows the equivalence between the two research groups in the variables under study, the researcher found that all the variables of the two research groups had the value of the differences between them by the value of (t) calculated and the value of the (SIG) corresponding to it is not significant, i.e. greater than 0.05, and this indicates That there are no differences between them in these variables and that they are equivalent and that both groups are under one initiation point.

**The first test: a test measuring the explosive power of the arms <sup>(2)</sup>:**

- Test name: From sitting on a chair, throwing a medicine ball weighing (2) kg with both hands.
- The purpose of the test: to measure the explosive force of the arms.
- The necessary tools: a flat surface area, an abrasive belt, two medicine balls weighing (2) kg, Fixed chair, tape measure.
- Performance description: The place of the chair is determined by a straight line, or a distinctive sign is fixed, the tester sits on the chair, and the torso is adjacent to the edge of the chair, a belt is placed around the tester’s chest and the tester is prevented from moving while throwing the ball, the tester holds the medicine ball with the hands and swings the arms back and then throws The ball with as much force as possible and using the arms.
- Test instructions: Ensure that the torso is fixed and not moved while throwing and that the feet are not moved while throwing the ball.
- Registration: The tester is given two attempts, and his best attempt is calculated.

**The second test: the jump up test to measure the explosive ability of volleyball players <sup>(3)</sup>:**

- Test name: Abalakov belt test to measure the explosive force of the leg muscles
- The purpose of the test: to measure the explosive power of the muscles of the legs.
- Tools needed: a tape measure in the form of a reel, a leather belt.
- Performance description: A leather belt is attached to the tester's waist, to which a tape measure loop is attached. The tape measure reel is placed between the tester's feet.
- Test instructions: Emphasis on standing with a chest width opening, and jumping with the greatest force upwards. His readings record the tape when standing, then his readings record the tape after jumping. The difference between the two readings represents the height of the player's jump.
- Recording: The player's entire length is measured, in addition to the difference between the two readings (the height of the jump), then the ability is calculated using the equation:

The ability to jump higher = the height of the player + the height of the jump / the height of the player

- Excellent level = 1.32 and above
- Good level = 1.28 to 1.22
- Weak level = less than 1.2

**The third test: a test of measuring t power Characteristic speed to legs <sup>(2)</sup>:**

- Test name: jogging by jumping five alternating steps
- The purpose of the test: to measure the strength characteristic of the speed of the two men.
- Tools used: tape measure.
- Method of performance: The tester stands behind the starting line, and after giving the signal, he begins to jump forward, push off with the support leg, and land on the second leg, i.e. from the right leg to the left leg or vice versa, for five alternating steps and calculates the time in seconds and its parts.
- Test instructions: The tester should not cross the specified starting line. Five alternating steps must be performed with the two legs.
- Registration: The tester is given two attempts, and the time for the best attempt is calculated in seconds and parts thereof, depending on an electronic stopwatch.

**The fourth test: a test to measure the strength endurance of the muscles of the two legs <sup>(3)</sup>:**

- Test name: Ascending and descending on a platform alternately within (30 seconds)
- The purpose of the test: to measure the strength endurance of the two legs.

- Tools used: a bench (30 cm high), an electronic stopwatch, and a whistle.
- Performance method: the tester stands with one of his feet on the bench, and after giving the signal, the tester starts by extending the bent leg on the bench, jumping to the height of the bench, then switching feet (putting the second foot on the bench) and landing the other foot on the ground, and the tester continues to perform for 30 seconds until the whistle is heard.
- Test instructions: The tester must perform all jumps on a level surface.
- Recording: You count the number of correct repetitions of the foot that was on the ground (before the start of the test) on the bench during the 30 seconds.

**Post-tests:**

The post-tests were conducted on Monday, 4/25/2022, and the researcher was keen on the importance of the similar conditions for the pre and post-tests, and the researcher processed the results between the pre and post-tests for the control and experimental groups with appropriate statistical means, for the purpose of knowing the significance of the differences or not in the tests Research topic.

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**RESULTS**

Table (2) shows the difference of the arithmetic mean and its deviations, the calculated (t) value, (sig) and the type of significance in the special strength tests under discussion for the control group in the pre and post-tests.

Tests	Experimental	Control	T value	Level sig	Type sig	
	Arithmetic mean Standard deviation	Arithmetic mean Standard deviation				
explosive power to legs	standard	0.012	0.004	2.915	0.033	Sig
	distance	1.666	1.054	1.581	0.175	Non sig
explosive power to arms	0.385	0.138	2.773	0.039	Sig	
power Characteristic speed to legs	0.146-	0.173	0.847	0.436	Non sig	
power endurance to legs	1.5	1.024	1.464	0.203	Non sig	
Significant at SIG value (0.05) if SIG level ≤ (0.05)						

**Results of pre and post-tests for the experimental sample:**

Table (3) shows the difference of the arithmetic mean, its deviations, the calculated (t) value, (sig) and the type of significance in the special strength tests under discussion for the experimental group in the pre and post-tests.

Tests	Experimental Arithmetic mean Standard deviation	Control Arithmetic mean Standard deviation	T value	Level sig	Type sig	
explosive power to legs	standard	0.039	0.008	4.468	0.007	Sig
	distance	8	1.232	6.461	0.001	Sig
explosive power to arms	1.066	0.141	7.545	0.001	Sig	
power Characteristic speed to legs	0.418-	0.148	2.822	0.0046	Sig	
power endurance to legs	4.5	1.231	3.654	0.015	Sig	
Significant at SIG value (0.05) if SIG level ≤ (0.05)						

**Results of post-tests between two samples (experimental and control):**

Table (4) Shows the arithmetic means and standard deviations in the special strength tests in the posttests between the two research groups (experimental and control)

Tests	Experimental	Control	T value	Level sig	Type sig			
	Arithmetic mean	Standard deviation	Arithmetic mean	Standard deviation				
explosive power to legs	standard	1.29	0.012	1.264	0.021	2.493	0.032	sig
	distance	53.333	1.632	48.5	3.446	3.102	0.011	sig
explosive power to arms	7.073	0.383	6.305	0.241	4.157	0.002	sig	
power Characteristic speed to legs	4.33	0.249	4.731	0.244	2.817	0.018	sig	
power endurance to legs	20	1.549	17.5	1.048	3.273	0.008	sig	

**DISCUSSION**

Through table (4) which shows that there are significant differences in favor of the experimental group and for all special strength tests at the expense of the control group. The researcher attributes these differences to the effectiveness of exercises similar to the performance that was applied to the experimental group in the isokinetic method that the isokinetic exercises that simulate the reality of kinetic performance. Those skills, whether applied on the designed device or without, contributed to enhancing the efficiency of the muscle groups through the principle that is applied according to isokinetic. This forces the muscles to bear the resistance along the range of motion of the joint and thus contributes to bearing the resistance and making the maximum effort for it. This is what "Training according to isokinetic devices is effective in developing strength because the resistance will be constant throughout the full range of

motion of the joint<sup>(8)</sup>. Therefore when performing the exercise on the device, which is a combination of the central and decentralized contraction of the muscle, the device will work to provide equal resistance to the strength performed by the athlete." In addition, the effectiveness of isokinetic training, especially in its use of devices prepared according to this principle, is standardized training. Thus ensuring its positive impact on the player in acquiring the training goals set for each exercise, thus achieving an improvement in the indicators of the special strength under study. This was confirmed by Gazar et al (2020) "Training according to the isokinetic method of the muscle leads to the development of muscle strength of the working muscles during a performance in a short time and with a high degree of efficiency compared to other training methods and methods<sup>(9)</sup> .

The researchers also believed that the use of the supplement (BCAA) with exercises that were

physical in nature, which the researchers were keen to prepare and perform by members of the experimental group sample according to the correct paths, and as the researchers indicate that the total repetitions of performances for each kinetic duty also contributed to the ability of muscle groups to work under conditions Fatigue, which generates the ability to adapt and endure to perform the required kinetic duty, and as a result, these functional organs (nervous and muscular systems) will be positively affected. This is what was indicated by Ali (2022)

“The component of strength endurance in its content is movements that are characterized by repetition of performance under different resistances and for a relatively limited period of time and in different kinetic conditions, as a result of the improvement of some of the basic capabilities from which it was formed (strength – speed – endurance)”<sup>(10)</sup>. In the result as a whole, the researchers found, and through the values shown by the post-tests, which are a real indicator of the effectiveness of the training method used using the supplement (BCAA) combined with the performance of skillful and physical exercises that worked on bringing about the functional adaptation of the muscle groups involved in performance, whether it was for the upper or lower extremities or the torso that developed indicators of the special strength under study. This was indicated by Ali (2022)<sup>(10)</sup> since the exercises that aim to increase the speed of the muscle and not its size is of the greatest benefit to the athletic achievement by employing selected movements characterized by the speed of performance, jumping up and explosive movements, as there is a mutual relationship between the movements of speed and the production of muscle strength by imposing Maximum tension on the muscles used for these movements<sup>(11)</sup>.

## CONCLUSION

- The supplement (BCAA) had a positive effect on improving the level of physical performance in volleyball.
- The physical exercises had a positive role in the development of the accuracy of the performance of the players by using them as an aid in the training units.

## RECOMMENDATIONS

- Using doses of the supplement (BCAA) that suit the sample, their ages, and the exercises used in terms of intensity, comfort, and size, and obtaining positive results.
- The need to give importance, such as coaches, by using nutritional supplements that motivate players to perform exercises in an interesting way, and to develop their skills better.

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