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The Effect of Integrated Training Method Exercises on Developing Certain Specific Strength Elements and Some Shooting Skills in Youth Basketball

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Abstract
The significance of this research lies in the design of training exercises utilising the Integrated Training method, as well as the comprehension of the extent of the impact of these exercises on specific strength elements (i.e. explosive power, speed-strength, strength endurance) and the achievement of excellence in complex offensive performance (i.e. basketball shooting). The research problem was formulated in response to the observation that the majority of coaches employ training methods that are commonly applied, yet do not primarily focus on muscular strength. Moreover, there appears to be a paucity of interest in updating and developing these methods and techniques to achieve the desired goal. The diversity of these methods and techniques has been demonstrated to enhance players' motivation, thereby positively impacting their physical and skill performance. One such contemporary method is the Integrated Training approach, which is designed to enhance strength endurance. Consequently, this is reflected in the development of explosive power, which is considered a fundamental pillar for some offensive basketball skills. The objectives of the research were to design training exercises using the Integrated Training method to develop certain specific strength elements and some basketball shooting skills for youth. Moreover, the objective of the study was to ascertain the impact of integrated training exercises on the development of specific strength elements and basketball shooting skills among young people. One of the most important conclusions reached by the researcher is the clear and significant impact of exercises on the development of specific strength and some shooting skills in basketball for young players. Accordingly, the researcher recommends the necessity of focusing on developing physical abilities in a manner that precedes and accompanies the development of shooting skills for young basketball players.

Keywords: Integrated training method, specific strength elements, basketball shooting skills.

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1. Introduction

The field of training has been influenced by the revolution in science and technology, with the result that the training process has taken on a form, structure, and organization that align with the state of development and modernity of the methods and tools used in training. Scientific and technological advancements have resulted in the introduction of numerous contemporary methods that are tailored to the age group of the trainees. Trainers are tasked with the responsibility of selecting the most suitable and recent methods for the specific activity. The objective of this approach is to leverage the specificity of training in relation to the nature of the activity, thereby directly affecting the enhancement of skill, physical, tactical, and psychological levels. This, in turn, aims to elevate the athlete to their optimal physical condition.

Basketball is regarded as one of the most popular sports on the global stage, and as such has attracted increasing attention on an international level. The observed progress in the global levels of basketball teams, especially in recent years, can be attributed to the harmonious integration of physical, skillful, tactical, and mental aspects. This harmony and integration did not occur spontaneously or randomly, but rather as a result of coaches' reliance on sports training science, a field based on other sciences that achieve optimal levels and results. Scientific evidence has demonstrated that the body's response to sports training is a critical factor in determining the extent of physical and skill enhancement in athletes. Furthermore, a state of creativity, innovation, and development in sports training methods and tools is evident through the utilisation of the principles and foundations of sports training. This necessitates scientific planning to prepare comprehensive training curricula, especially the integrated training method (Integrated training).

Whilst complexity is widely regarded as a hallmark of contemporary training methodologies, this necessitates that the coach, in pursuit of optimal outcomes, must meticulously analyse the minutiae that influence the performance of their athletes. This entails the identification of deficiencies, whether they pertain to physical, technical, or other domains, and the subsequent implementation of remedial measures.

While a coach may succeed in enhancing the physical capabilities of their players, if this enhancement is not accompanied by the players' correct application of proper mechanical principles, it may result in a futile exertion of physical capacity, leading to the depletion of energy resources, the loss of time, and the failure to achieve the desired outcomes of the training process, thus rendering it ineffective.

Basketball is a sport that demands a wide range of skills, one of which is the Mini Shimmy Shoot, which refers to close-range shooting. These competencies are executed in response to unanticipated factors and variables that demand elevated levels of strength, speed, and precision.

The importance of the utilisation of offensive skills in basketball is increased due to their decisive role in the scoring of points, where performance is governed by the principles of precision, power, and speed. The acquisition of these skills necessitates players who possess superior physical abilities, which are the principal determinants of skill success.

The significance of this research lies in the development of training programmers employing an integrated training approach, and in the comprehension of the extent to which these training programmers impact specific strength elements (explosive power and strength endurance) and the attainment of excellence in complex offensive performance (basketball shooting).

1.1. Research Problem

Through their review and field follow-up of the training process, the researchers observed that most trainers rely on commonly applied training methods that do not primarily focus on muscular strength. Additionally, there is little attention given to updating and developing these methods and techniques to achieve the desired goal. The diversity of these methods and techniques increases player engagement, which positively reflects on achieving a good level of physical and skill performance.

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One of these modern methods is the Integrated Training approach, which works on developing strength endurance and consequently reflects on enhancing explosive power—a fundamental pillar for certain offensive basketball skills (such as jump shooting). Based on the above, the research problem can be summarized in the following question:

Does the use of training with the Integrated Training method have an effect on certain specific strength elements and some basketball shooting skills among youth?

1.2. Research Objectives

1- To prepare exercises using the Integrated Training method to develop certain specific strength elements and some shooting skills in youth basketball.

2- To identify the effect of exercises using the Integrated Training method on developing certain specific strength elements and some shooting skills in youth basketball.

1.3. Hypotheses

1- The present study investigates the impact of exercises employing the Integrated Training method on the development of specific strength elements and shooting skills in youth basketball.

2- There is a difference in effect between exercises using the Integrated Training method and the coach's exercises in developing certain specific strength elements and some shooting skills in youth basketball.

1.4. Research Scope

1- Human domain: Youth basketball players of Al-Tadamun Club for the 2022-2023 sports season.

2- Time domain: From June 17, 2022, to October 27, 2022.

3- Spatial domain: Martyr Asaad Shukr Hall in Najaf Al-Ashraf Governorate.

1.5. Definition of Terms

Integrated Training Method: (A training method that combines two elements—strength endurance and explosive power—simultaneously. It also manipulates physiological and physical aspects of strength endurance to achieve and produce explosive power for the purpose of improving athletic performance).

2. Methodology and Procedures' field

2.1. Methods

The study's researchers employed an experimental method with the equivalent groups design (i.e., experimental and control groups), utilizing pre-test and post-test measures. This design was deemed suitable due to the nature of the problem.

Table (1). The experimental design of the research groups.

Group	Pre-test	Experimental treatment	Experimental Group
Post-test	Special strength elements + jump shooting	Integrated training method	Special strength elements + jump shooting
Control Group	-Special strength elements + jump shooting	Exercises prepared by the coach	Special strength elements + jump shooting

2.2. Research Population

The study population included 20 players between 15 and 17 years old from Al-Tadamun Sports Club. They were divided into two groups: an experimental group and a control group, each with 10 players.

2.3. Tools, Instruments, and Devices Used in the Research

2.3.1. Information Collection Methods

1- Personal interviews.

2- References and sources.

3- The Internet.

4- Tests and measurements.

5- Registration forms.

2.3.2. Devices and Instruments Used in the Research

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The researchers used many tools that helped them obtain the required data:
1- Elastic band.
2- Measuring tape.
3- Laptop (FUJITSU).
4- Electronic stopwatch (2 units).
5- Plastic markers of different heights (15 units).
6- Official basketballs, type (molten) (10 units).
7- Whistles, type (Dolphin) (2 units).
8- Pens of different colors (5 units).
9- Adhesive tape of different colors.
10- Chalk.

2.4. Description of the tests used in the research

2.4.1. Vertical Jump Test from a Standstill (Sargent Test)

- Purpose of the test: To measure the explosive strength of the leg muscles.
- Required tools for the test: A smooth wall of appropriate height, chalk, measuring tape.
- Performance description: The subject stands facing the wall and raises both arms as high as possible, marking a point on the wall with chalk while ensuring that the heels do not lift off the ground. The marked height is recorded.
- From the standing position, the subject swings the arms downward and backward while bending the torso forward and downward with knees bent at a right angle (90 degrees). Then, the subject extends the knees and pushes off the feet upward while swinging the arms forward and upward to reach the highest possible point, marking the second point at the highest reach achieved.

- Test Instructions

- The jump must be performed by pushing off with both feet from a stationary position.
- Before the jumper leaps upward, they should swing their arms forward and downward to time the movement for achieving maximum height.
- Speed of execution is important.
- Measurements are recorded to the nearest 1 cm.
- Each participant has two attempts.
- The score recorded by each participant is announced to the next participant to ensure a competitive environment.

- Test Administration

- Recorder: Calls out the names first and records the results second.
- Judge: Observes the performance first and calculates the scores second.

- Scoring Calculation

The participant's score is the number of centimeters between the standing line and the mark reached as a result of the upward jump, rounded to the nearest 1 cm.

2.4.2. Strength Endurance Test

- Test Name: Strength Endurance Test / Continuous two-footed jumping to cover the greatest distance in one minute.
- Purpose of the Test: To measure the strength endurance of the leg muscles together.
- Equipment and Facilities: Football field, measuring tape, and stopwatch.
- Test Procedure: Continuous jumping with both feet together, touching marked lines on the ground.
- Scoring Calculation: Record the greatest distance covered in meters within one minute; the distance covered indicates strength endurance.

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2.4.3. Mini Shimmy Shoot Skill Test

- Test Name: Mini Shimmy Shoot Test.
- Purpose of the Test: To measure the performance of the Mini Shimmy Shoot skill.
- Equipment and Tools: One basketball, whistle.
- Performance Description:

The player stands at the corner formed by the intersection of the sideline of the free-throw lane and the free-throw line, with their back to the basket, while being defended from behind by a defender playing man-to-man defence. A teammate stands before the three-point line holding the ball. Upon hearing the starting whistle, the offensive player receives the ball passed from a teammate. Ideally, the moment the offensive player receives the ball should coincide with both feet firmly planted on the ground. Then, the player performs a quick and simple rotation of the shoulder and torso with the ball to one side until the defender steps toward that side. Next, the player quickly rotates to the opposite side by shifting the foot, shoulder, and torso with the ball to deceive the defender, face the basket, and gain a shooting opportunity. Afterwards, the player jumps and shoots at the basket after evading the defender's pressure, as illustrated in Figure 1.

- Scoring: Scoring is conducted according to the actual performance evaluation form for the Mini Shimmy Shoot skill, as shown below:

No.	Player Name	Receiving	Feinting	Shooting Execution	Shooting Result	Total	
		Deg 2	Deg 5	Deg 3	Deg 2	Deg 12	
1							

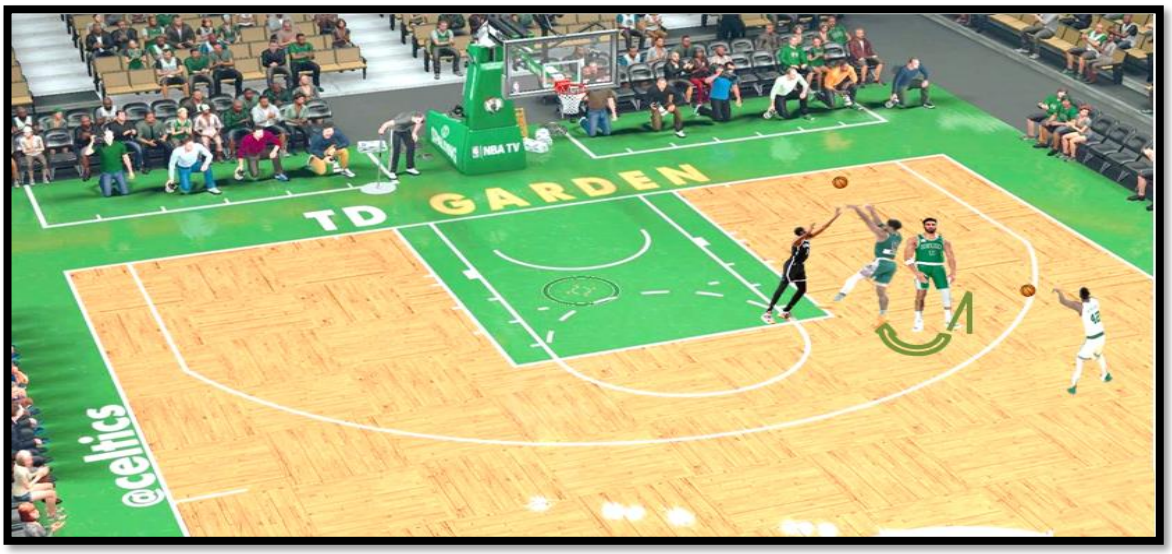

Figure (1). The technical performance of the Mini Shimmy Shoot skill (by Authors).

2.4.4. Close-Range Shooting Skill Test in Basketball

- Objective: Scoring by jumping from the free-throw line, then moving circularly to the center and right.
- Required Equipment: Basketball court, measuring tape, 2 basketballs, basketball hoop, chalk.
- Procedures: Draw three points in a small circle with a diameter of 15 cm as markers indicating the three zones where the test will be performed as follows:
- The first marker is 30 cm to the left of the end of the free-throw line.

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- The second marker is at the midpoint of the free-throw line, 90 cm away from the free-throw line toward the three-point line.
- The third marker is 30 cm to the right of the free-throw line.
- Performance Description: The player stands at the designated spot outside the free-throw area on the left side, holding the ball. The player performs a jump shot toward the basket.

The player executes 15 shots divided into three sets, each set consisting of five shots:
- The first set from the left side of the free-throw line.
- The second set from the center of the free-throw line.
- The third set from the right side of the free-throw line.
- Scoring: The player receives 2 points for each shot that goes into the basket, 1 point for each shot that touches the rim but does not go in, and 0 points for shots that do not touch the rim at all.

2.5. Exploratory Experiment

Prior to conducting the primary experiment, it was imperative to conduct an exploratory experiment on a small sample from the research community. The objective of the study was twofold: first, to assess the efficacy of the research instruments and tools; and second, to determine the most effective methods of implementing the aforementioned instruments and tools, in addition to extracting the scientific foundations. The exploratory experiment was conducted on a sample consisting of eight (8) players on Thursday, June 23, 2022, at 4:30 PM in the Asaad Shukr Hall in Najaf Al-Ashraf Governorate.

2.6. Main Experiment

2.6.1. Pre-test

The pre-test was conducted on June 29, 2022, at 4:30 PM. All variables were controlled to ensure consistency during the post-test.

2.6.2. Training Using the Integrated Training Method

After conducting the pre-test, the researchers applied the exercises to the experimental research group from Monday, July 4, 2022, until August 27, 2022, for a duration of 8 weeks.

1. The total number of training units for the (Integrated training) method is 24 units.
2. The number of weekly training units included in the (Integrated training) method is 3 units for a duration of 8 weeks.
3. The duration of training sessions using the (Integrated training) method per training unit is 30-40 minutes (during the special preparation period).
4. Training days during the week are Monday, Wednesday, and Saturday, as these days align with the nature of the program designed by the researchers and agreed upon with the trainer to avoid overlap in training units. Moreover, these days correspond to the workload fluctuations mapped out for the training week.
5. The objective of the training using the (Integrated training) method is to develop specific strength components, which are (explosive power and strength endurance), directly related to offensive basketball skills.
6. The intensity was determined by time, repetitions, and weights for the (Integrated training) method.
7. The maximum intensity (100%) for each exercise was calculated to design the curriculum and training units.

2.6.3. Post-Test

After completing the implementation of the (Integrated training) method, the post-test for the experimental group was conducted on Sunday, 4/9/2022, at 4:30 PM, taking into account all the temporal and spatial conditions of the pre-test. The post-test was administered in Asaad Shukr Sports Hall with the assistance of the research team.

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2.7. Statistical Tools Used

1. Median
2. Interquartile Range
3. Wilcoxon Signed-Rank Test
4. Simple Correlation (Pearson)
5. Mann-Whitney U Test.

3. Presentation, Analysis, and Discussion of the Results

4.1. Presentation of the Test Results for specific strength elements and some types of basketball shooting skills for the experimental group

Table (2). The median values, interquartile ranges for the pre-test and post-test, the calculated Wilcoxon value, and its statistical significance for the test results of specific strength elements and some basketball shooting skills for the experimental group.

Test	Pre-test		Post-test		Sample Size	Wilcoxon Calculated Value	Wilcoxon Tabular Value	Significance Type
	Median	Quartile Deviation	Median	Quartile Deviation				
Strength endurance	101.822	6.825	108.805	7.198	7	8	2	Significant
Explosive strength	0.556	0.527	1.524	0.521	7	0	3	Significant
Mini Shimmy Shoot	0.667	0.500	1.556	0.527	7	3	2	Significant
Close shooting	0.651	0.426	1.516	0.522	7	4	2	Significant

By reviewing Table 2 for the experimental group tests, it is observed that there is a difference between the pre-test and post-test results for the experimental research group, indicating statistically significant differences.

3.1. Presentation of Test Results for Specific Strength Elements and Some Types of Basketball Shooting Skills (Control Group)

Table (3). The median values, interquartile ranges for the pre-test and post-test, the calculated Wilcoxon value, and its statistical significance for the test results of specific strength elements and some basketball shooting skills for the control group.

Test	Pre-test		Post-test		Sample Size	Wilcoxon Calculated Value	Wilcoxon Tabular Value	Significance Type
	Median	Quartile Deviation	Median	Quartile Deviation				
Strength endurance	100.695	6.601	104.939	6.496	7	2	3	Significant
Explosive strength	0.556	0.527	1.000	0.167	7	2.5	3	Significant
Mini Shimmy Shoot	0.567	0.485	0.889	0.200	7	3	3	Significant
Close shooting	0.556	0.726	1.000	0.167	7	4	3	Significant

By reviewing Table 3 for the control group tests, it is observed that there is a difference between the pre-test and post-test results for the control research group, indicating statistically significant differences.

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3.2. Presentation of Pre-Test and Post-Test Results and the Calculated Mann-Whitney U Value for Test Results of Specific Strength Elements and Some Types of Basketball Shooting Skills (Control and Experimental Groups)

Table (4). The median values, interquartile ranges for the post-test, the calculated Mann-Whitney U value, and its statistical significance for the test results of specific strength elements and some basketball shooting skills for both the control and experimental groups.

Tests	Control Group		Experimental Group		Sample Size	Mann-Whitney Calculated Value	Mann-Whitney Tabular Value	Significance Type
	Median	Quartile Deviation	Median	Quartile Deviation				
Strength endurance	104.939	6.496	108.805	7.198	7	11	15	Significant
Explosive strength	1.000	0.167	1.524	0.521	7	0,5	0.009	Significant
Mini Shimmy Shoot	0.889	0.200	1.556	0.527	7	0.7	0.04	Significant
Close shooting	1.000	0.167	1.516	0.522	7	0.9	0.008	Significant

By reviewing Table (4), which shows the median value, interquartile range, and Mann-Whitney test values for specific strength elements and some basketball shooting skills, it is evident that there are significant differences in favor of the experimental group.

4. Discussion of Results

From the previous incidents, it is clear that there is special strength and some shooting skills among young basketball players in both the control and experimental groups. The researcher attributes the development observed in the control group to the influence of the conventional training program set by the coach, as well as the players' continuity and regularity in training sessions.

As for the development observed in the experimental group in special strength and some shooting skills, the researcher attributes this progress to the improvement of strength elements among the young players. The Integrated Training exercises align with the set goal, as endurance strength and explosive power are important factors for the success of the offense in general. This is because they help create spaces that allow the attacker to shoot well and score points in difficult situations and under defensive pressure.

Special strength elements are considered "one of the indicators of an athlete's efficiency in overcoming the resistances faced during continuous effort in performance." Additionally, Integrated Training exercises have taken on a new approach by combining special strength exercises needed by the player to execute any basketball skill along with the researched skills (Mini Shimmy Shoot - close shooting) in one exercise, which resembles actual game situations.

This method is considered an effective training approach through which players are prepared and provided with various experiences via different competitive situations during training units. This approach works on developing all skill and physical aspects of the players to help adapt them to the demands of different matches. A conscious attacker aware of modern playing methods should understand the importance of these skills.

The exercises prepared by the researchers also work on increasing the player's understanding of defending against the attacker with or without the ball and the distance between the defender and the attacker who is in the area for which that defender is responsible. In this case, the attacker must continuously adjust their body position so that they are at the apex of a triangle whose base is the passing pressure between the ball and the attacker, allowing them to always see both the ball and the attacker at the same time.

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5. Conclusions and Recommendations

5.1. Conclusions

Based on the results obtained in the study, the conclusions were:

1- There is an improvement in specific strength and certain types of shooting skills researched among young basketball players in both the experimental and control groups.

2- The research results clearly and genuinely show the impact of training exercises on the development of specific strength and certain types of shooting skills among young basketball players in both the experimental and control groups.

5.2. Recommendations

Based on the previous conclusions, the researchers recommend:

1- Focusing on developing shooting skills for young basketball players.

2- Emphasizing the development of specific strength in a manner that precedes and accompanies the enhancement of offensive skills for young basketball players.

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