

THE IMPACT OF COMPOUND EXERCISES ON YOUNG HANDBALL PLAYERS' ABILITY TO AIM ACCURATELY AND QUICKLY WHILE FALLING

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Abstract

One of the fundamentals that a handball player requires is kinetic speed, which is represented by the speed with which kinetic skills are performed, as well as perceptual speed, which is one of the mental processes that must be considered as it aids in achieving the correct path of skillful performance and the ability to understand the opponent and quickly perceive situations to take the right decision at the right time and place to respond to his strikes. As a result, most coaches strive to provide kinetic qualities to their players and crystallize them in the development of kinetic and cognitive speed, as well as accuracy of shooting from falls for handball players. The study's goal was to plan complex exercises (physical, kinetic, mental skill) within the single performance and then knowing the effect of these exercises in developing the cognitive speed, kinetics and accuracy of shooting from falling for handball players. To solve the research problem, the researcher used the experimental method in a controlled manner (experimental group + control group) with a pre and post-test on a sample of handball players, who were chosen in a deliberate manner from the age of (15-16 years) and their number is (12). The researcher is looking for consistency among the members of the research sample. Then the research sample was distributed randomly between the two groups in the tribal tests, and after preparing the compound exercises, those exercises were applied for a period of two months and by 24 units, and the exercise time was between 15-20 minutes within the beginning of the main section of the training unit and then conducting post-tests, and after collecting, processing and discussing the results. The researcher concluded that the compound exercises prepared by the researcher improved the cognitive and kinetic speed and accuracy of shooting from falling for handball players in the experimental group sample better than the control group sample. The researcher concluded that the compound exercises prepared by the researcher improved the cognitive and kinetic speed and accuracy of shooting from falling for handball players in the experimental group sample better than the control group sample.

Keywords: Compound exercises. Perceptual speed. Accuracy of aiming from a fall.

Introduction

The handball game receives significant attention from specialists in the field of physical and sports education, with the goal of reaching advanced sports levels by selecting players with sports talents and enrolling them in specialized handball schools at an early age in order to build a broad sports base in the field of handball. One of the basic requirements for a handball player is the availability of both the kinetic speed represented by the speed of performance, as well as the perceptual speed, which is one of the mental processes that must be considered as it helps in achieving the correct path for the accuracy of shooting from falling for handball

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players and related to the sense of sight, and ability. Understanding the opponent's strengths and weaknesses, as well as his/her speed in realizing situations, allows you to make the right decision at the right time and place to respond to his/her strikes (Al-khoury et al., 2022). Therefore, most of the coaches seek to provide the player with kinetic qualities and crystallize them in the development of kinetic and cognitive speed and accuracy of shooting from falling for handball players, so the researcher sought to pay attention to the cognitive and kinetic mental abilities that give the correct kinetic behavior of the ball paths, and thus the accuracy required in the ball falling into the field with the speed of performance by investing complex exercises (physical and mental skills) in one performance and their characteristics that work to give the correct kinetic behavior, speed and accuracy of shooting from falling to handball players.

Following up on handball competitions and making multiple trips to the National Center for the Care of Sports Talent in Handball, the researcher discovered a weakness in the accuracy of shooting from falling for handball players and diagnosed this through the tests researcher administered to the players to identify and understand the issue, and she attributed this weakness to the lack of the necessary kinetic and mental abilities, particularly the kinetic and perception abilities. This has an impact on how accurately handball players are directed and shot to prevent them from falling, and then exercises are prepared that combine physical, skill, and mental performance in a complex performance. This method is not found in the training of the players of the National Center for the Care of Sports Talent in the game of handball, after reviewing their training and the training curriculum of the center and giving notes on this. The school principal and coaches welcomed the comments and anything new that would help the handball training process.

Research aims

1. Working to make complex handball exercises (mental, kinesthetic, and skill).
2. Determining the impact of combined exercises between pre and post-tests conducted by experimental and control research groups on the speed and accuracy of handball players' cognitive and kinetic shooting while falling.
3. Understanding the variations between the experimental and control

groups' post-tests for the cognitive and kinetic speed test and the handball players' accuracy when shooting from falls.

Research Methodology

In line with the nature of the research problem, the researchers used the experimental method by designing two equal groups, the experimental and the control.

Sample

The research community was determined by the pivot circle players (the junior handball category in the handball specialized schools at the ages of (15-16) years, and their number was (16) players.

The research sample was selected from (12) players in a simple random way, and it represented a percentage of (21%) (Table 1).

It shows the homogeneity of the research sample by the skew coefficient in the Variables (chronological age, length, mass).

The tests used in the research

The first test: the lateral foot distance perception test (Muhammad, 1999).

The purpose of the test: To assess the ability to perceive the lateral foot distance, which is accomplished by identifying the extent of the proximity and distance from the line specified for the distance of the foot transport, provided that sight is not used.

Table 1: Shows the sample distribution's validity and homogeneity, because one of the properties of homogeneity is that the skew coefficient is confined between two values (+1) if the sample size is less than (30) individuals.

Variables	Measuring units	Arithmetic mean	Median	Standard deviation	Skew coefficient
Chronological age	year	15,11	11	0,83	-0,22
length	cm	169,6	169,5	2,42	0,13
mass	Kg	55,38	34	0,91	0,11

Devices and tools: Measuring tape, an eye band, white chalk and tape for marking

Performance description: On the ground, draw two lines with a distance of (12) inches (4 and 29 cm) between them. The player waits five seconds with his eyes covered while standing on the starting line, observing the distance needed to move his right foot to the second line in order to reach the necessary distance. Three attempts are given in an effort to move away from the designated line accurately, reduce errors, and achieve the required distance.

Evaluation: Each attempt is noted for the proximity of the (1) between the two heels, and the total of the three attempts is computed at the conclusion (Figure 1).

The second test: involves running 20 meters from a standing position

The test's objective: it is to determine the transitional velocity.

Tools: stopwatch, whistle, level surface, straight line, and tape measure's beginning and ending lines.

Performance procedure: The tester stands behind the starting line and, upon hearing the signal, immediately begins running at full speed until he has covered the required distance.

Recording: It keeps track of the number of seconds it took the laboratory to cover the distance.

The skill test: the front-fall shooting test on shooting accuracy squares, (Samer, 1999; Flayyih & Khiari, 2023).

The test's objective: to gauge shooter proficiency. Test specifications: Shooting accuracy squares (50 cm x 50 cm) suspended in the upper corners of the target, with six handballs on a handball court.

Performance requirements: The player faces a colleague who is in front of him to pass the ball to him as he stands in front of a line six meters away from the goal. He then turns to face the goal and leans and shoots on the accuracy

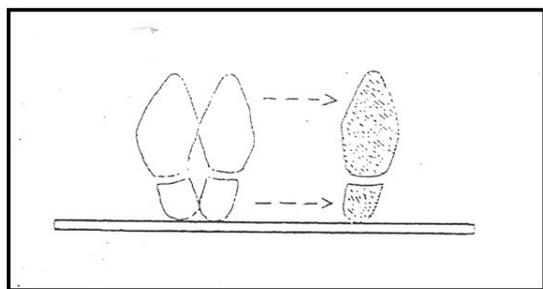


Figure 1: Lateral Foot Distance Perception Test.

boxes before falling to the ground. He then replies that he shoots three balls on each square and cascading.

Evaluation: The laboratory keeps track of the number of attempts that were successful, and scores are computed as follows:

1. The laboratory receives 2 degrees if the ball enters the accuracy square.
2. The tester receives 1 degree if the ball strikes one of the shooting accuracy square's sides.
3. A score of 0 is awarded if the ball exits the goal.
4. Consequently, the laboratory's highest value is (12) degree.

Survey experience: in order to determine the challenges that the researcher would have when conducting the tests and applying the experiment, one for the tests and the second for the difficult exercises, the researcher ran the exploratory experiment on the exploratory research sample of (4) players.

Pre-tests: On July 12, 2019, in the indoor hall of the National Center for Sports Talent in Baghdad, the researcher conducted tribal tests on the experimental and control samples after warming up the participants. All of the temporal and spatial conditions were fixed with the intention of integrating them with the post-tests.

The main experiment: following the completion of the pre-test implementation, the researcher began the main section of the training unit with the sensory-kinesthetic perception exercises she had prepared, and she then finished the main section with those same exercises. The exercises were also used in the special preparation stage. The experimental group had a personal coach who was given the particular exercises set for them at the beginning of the main part and on the playgrounds of the youth center. The trial lasted for 8 weeks and was divided into (24) training units at a pace of three units per week. After completing the special exercises, they are integrated again to complete the training unit for them under the supervision of their coach. The researcher used intensity ranging between (80-95%) and the training volume of the exercises reached (25-45) minutes of the size of the training unit. The researcher used the method of periodic and repetitive training.

Post-tests: on September 9, 2019, the researcher conducted post-tests on the experimental and control samples after warming up the participants in the two study samples. All of the temporal and spatial conditions were set with the intention of integrating the post-tests with the pre-tests.

Presentation and discussion of the results of the pre and post-tests for the control and experimental groups

The information can explain in tables (Tables 2 and 3).

Discussing the results

After presenting the findings in Tables 2 and 3, it was discovered that compound exercises aided in the development of kinetic and perceptual speed. The researcher attributed this to the factors Iman (1998) indicated,

Table 2: It displays the pre and post-test means, standard deviations, calculated t values, and their statistical significance for the two research groups' examined variables.

The significance of the differences	Error level	Calculated T value	Post-test		Pre-test		The group	Measruing unit	The exams
			St. Dev.	Mean	St. Dev.	Mean			
Significant	0	8,48	1,6	6,5	1,4	6	control	distance	Lateral Foot Distance Perception Test
			1,7	7,5	1,5	6,5	Experimental		
Significant	0	2,22	0,18	1,69	0,07	1,74	control	second	Running test for a distance of (20) m from standing
			0,11	1,39	0,21	1,77	Experimental hsجئاتن، تان یرمیتلا یرفنپ		
Significant	0,028	2,20-	1,5	7	1,12	4	control	Degree	Fall shooting accuracy
			0,25	10,5	0,37	4,5	experimental hsجئاتن، تان یرمیتلا یرفنپ		

Table 3: It displays the post-test means, standard deviations, calculated t values, and statistical significance for the two research groups for the variables under study.

The exams	Measruing unit	The group	Mean	Standard deviation	Calculated T value	Level of error	The significance of the differences
Lateral Foot Distance Perception Test	second	control	6,5	1,6	8,23	0	significant
		Experimental	7,5	1,7			
Running test for a distance of (20) m from standing	second		1,69	0,18	2,214	0	significant
		control	1,39	0,11			
Fall shooting accuracy	second	Experimental	7	1,5	6,21	0	significant
			10,5	0,25			

citing from (Mahmoud Anan: 1995). The concept of a simple reflex arc, through which the sensory-kinetic perception process is thought to take place, can be summed up as follows: the receptor (the sense organ) receives one of the environmental stimuli, and the information is transmitted through the nerve fibers, through the neural connection area, and towards the outgoing kinetic nerve fibers responsible for excitation of the fibers muscle. The fusion of the neural junction takes place within the spinal cord.

This explains that the development of any skill necessitates the equivalence of skill with mental abilities, and that nurturing these abilities has a close relationship with enhancing learning and performance by focusing on the kinds of perception and emotional processes that are closely related to the understanding of mathematical skill. Since the perception occurs before the kinetic response is finished. Performance cannot be enhanced and developed if the skill is not realized during the learning process (Saad, 1996; Mohammed & Kzar, 2021).

According to (Hazem, 2006), "The handball game is one of the group games to which a number of perceptions are linked in the performance of special kinetic skills", and the researcher attributes these differences to the fact that the accuracy of the skill of shooting from falling handball depends greatly on the abilities of sensory-kinetic perception. The ability to perceive space, time, and the sensation of the ball are the most crucial perceptions since they constitute the foundation of accurate ball control (Visions & Al-Selmi, 2021).

This study supports the study (Al-Selmi et al., 2019; Al-Selmi, 2020) that found that the kinetics of the exercised activity helped to develop physical attributes during the combination (combined) exercises. Here, it is important to distinguish between individual physical preparation, which can help an athlete reach a better level, and preparation for specialized sports, which can help an activity's features grow. The capacity to train is integration of action.

By working on muscle tension and relaxation quickly and in less time, compound exercises had a positive impact on the development of cognitive and kinetic speed and accuracy of shooting from falls. This resulted in the development of movement speed and speed of perception of working muscles and gave them the necessary kinetic coordination due to the mutual work between the central and eccentric contractions quickly. "The greater the muscle's ability to stretch, the greater the opportunity for rapid and strong muscle contraction" (Fatima, 2008). "Performing complex exercises that include speed, accuracy, and awareness, and in accordance with the skillful performance, helps in increasing the perceptual ability of the kinetic sense and upgrading the accuracy of the skillful performance." (McArdle et al., 2000).

Supplement 1 Compound exercise model

1. Three players stand facing a wall that has been divided into three squares, each measuring 20 by 20, 30 by 30, and 40 by 40, in the order listed. The first square, the second square, and the third square are each separated by 1 meter, 1.5 meters, and 2 meters, respectively. Throws should be repeated in between players.
2. A colleague stands behind the player as he faces the wall from a distance of two meters. The colleague then throws a ball to the smooth wall in the designated area while standing behind the player so that the player cannot see from which direction or in which direction the ball will go. The first player then catches the ball after it bounces off the wall. Players switch positions and performances for 30 seconds with his striking arm.
3. Three players are positioned facing a wall that is divided into three 30 x 30 squares, one meter away from each square. The players start dealing straight blows to the squares for ten strikes as soon as the signal is given.
4. The player strikes the circles in sequence from 1 to 10 as quickly as they can while facing a wall with numbered circles painted on it from a distance of 2 meters away.
5. While attempting to continue performing the strikes without losing the ball, the two players stand facing each other and the target at a distance of three meters apart and alternate handling with proximity and distance. When the whistle is sounded, they score from the fall.
6. The player is positioned close to funnel No. 1, which is 2 meters away and situated in the center of the playing area. When the signal is given, the second player tosses the ball, causing the first player to move to the center and then to the opposite left side in order to get to the second funnel, which is 2 meters distant, where the goal is to land.
7. The players begin in the standby and opposite positions, with the leader choosing one of them and the second player by reversal. The movement of the leader includes lateral hopping, fast side movements on both sides, and random side motions. The player tries to follow the leader's steps backward for 30 seconds, rest for 15 seconds, then switch the leader and have him become reflective, who then becomes the leader again, and so forth.

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