Journal of Applied Sports Science
September 2015, Volume 5, No. 3

The Effect of Developing Some Visual Capabilities and Combined Offensive Skillful Performances on the Effectiveness of Offence in Handball.

Mohamed Ashraf Kamel
Faculty of Physical Education – Alexandria University, Egypt.

Abstract

Objective of The Research:

Upgrading the effectiveness of offense in the different playing positions for the national team handball juniors through the development of the speed of combined offensive skillful performances and the visual capabilities.

Research Hypotheses

- *combined offensive skillful performances can be listed (in quantity and quality).*
- *there are statistically significant differences in the average visual capabilities and the combined offensive skillful performances of the control group between the pre-measurements and the post-measurements, favoring post-measurements.*
- *there are statistically significant differences in the average visual capabilities and the combined offensive skillful performances of the experimental group between the pre-measurements and the post-measurements, favoring post-measurements.*

Research Procedures

Based on the research procedures, the following steps were taken:

Method

The experimental method: using the two-groups design, with one control group and one experimental group to measure the effectiveness of the proposed training program to achieve the main research goals.

Research Community

The research sample consisted of 36 national teams juniors born in 1998 and twelve matches of the 2013 Spain World Championship were analyzed, with approximately similar tactical levels to avoid discrepancy in the percentage of performing the combined offensive skills.

Geographical scope: the proposed program was applied in the indoor hall of the Cairo International Stadium

Time scope: the basic study was conducted in the period from 27/9/2014 to 7/1/2015 as follows:

- *Pre-measurements were taken in the period from 27/9/2014 to 1/10/2014*
- *The proposed training program was applied to the research sample in the period from4/10/2014 to 1/1/2015.*
- *Post-measurements were taken in the period from 3/1/2015 to 7/1/2015.*

Conclusions*:*

training by using visual capabilities has a positive effect on performing the combined offensive skills in handball.

Recommendations:

Conducting similar studies on the effect of visual capabilities on developing the combined defensive skills in handball and in other sport games..

Introduction:

There has been a growing interest in handball in modern times, with the game becoming more popular in most countries of the world, and especially in Egypt, in view of the great achievements made by Egyptian teams in international events. Egypt has been winning top positions, one after the other both on junior and men levels. Undoubtedly, such successes were the result of careful scientific planning on the part of the different committees of the Egyptian Handball Federation whose efforts were reflected in instructing beginners and training junior players. Through these efforts, training was

directed towards upgrading the different attributes of players, whether these are skillful, physical or tactical.

Skillful performance, in particular, is highly complicated and combines several overlapping mental, somatic and functional factors, because movement is the result of integration between the different parts of the body within one general framework in a given time and place context.

According to Kamal Darwish et al (1998), "handball is based on the rapid individual skillful and tactical performance, the motor relationships between players, their ability to interact with each other and on the player's struggle against the rival" (19-42).

Amrallah el Basaty (1994) and Yasser Dabbour (1997) also agree with him, stressing the inter-relationship between handball skills and the fact that they are inseparable, and that they include several motor responses of various kinds to unexpected changing attitudes from the rival. The player in the court usually performs under circumstance which are unpredictable and whose requirements are also difficult to identify, which in turn make his performance unpredictable. Skillful requirements are also multiple and various and usually come in the form of motor movements or combinations of movement. Predicting situations during the game is one of the factors determining the type of performance chosen by the player. Personal experience also counts because the player in possession of the ball often has many options (different types of passing, different types of shooting, running with the ball, etc.). Other factors also affect a player's decision, such as re-actions by colleagues and rivals, direction of the ball, etc. Based on that, he would choose the suitable performance (6: 21-22)(29: 20-21).

On the other hand, the various playing positions in team games in general and in handball in particular force the player to use many forms of combined skillful performances with or without the ball. It is important therefor to use training forms which are close to the actual competition and to acquire such forms as early as possible, so as to make full use of time in training players on such skillful performances. This was confirmed by Whidson, Renolds (1983), Mofty Ibrahim (1994), Hanafy Mokhtar (1999), Khaled Hammouda and Yasser Dabbour (1995), Kamal Darwish et al. (1998), Amrallah Al-Bassaty (1999) and Mohamed Keshk and Amrallah Al-Bassaty (2002): "possessing various forms of skillful performances similar to the game requirements at an early time allows the player to choose the best in most actual playing situation. It increases the ability to tackle, feint and carry out tactics in various positions and directions so that he is not surprised by a situation for which he was not trained, thus he can achieve the speed of the performance accurate and compatible in carrying out the required tactical duty, because it is mentally easy but more important for the success of the tactics is the actual application which largely depends on the various performances possessed by the player". (47:23) (27:131) (10:137-138) (21:160-161) (19:8-11) (6:45) (23:63).

The visual system is one of the most frequently used systems in sport performance of any sport activity because vision affects the ability or the efficiency of the athlete when meeting the requirements of his/her special sport. Researchers have been trying to identify the visual skills necessary for different sports and finding out whether visual skills of athletes are different from those of non-athletes. Such attempts though incomplete, found out that some visual skills are important for performance in different sports, and that visual skills of athletes are different from those of non-athletes (17) (30) (31) (33) (35) (38) (39) (41) (43) (44). This is quite logical when talking about the software aspects of vision (which refer to how to deal with visual information collected from an outside medium and its use), thus distinguishing between athletes and beginners (41).

Supervising national teams as member of the national teams committee and the higher committee of trainers and training in the Egyptian national handball federation gave the author of this paper the opportunity to notice the decline in the results achieved by the first Egyptian team. These results were obvious in France World Championship of 2001, when Egypt ranked fourth, the 2003 World Championship in which Egypt ranked 15th, the 2014 Olympics in which Egypt ranked 14th, the 2005 World Championship in which Egypt ranked 14th, the 2007 World Championship in which Egypt ranked 17th, the 2008 Olympics in which Egypt ranked 10th, Croatia World Championship of 2009 in which Egypt ranked 14th, Sweden World Championship of 2011 in which Egypt ranked 14th, the 2012 World Championship for which Egypt was not qualified and Spain World Championship of 2013 in which Egypt ranked 14th. In all these championships, results and performances of the Egyptian team deteriorated, especially in the offensive work, after a good history of the Egyptian team both on the offensive and defensive levels. The team which excelled in the different forms and styles of offensive skillful performances, has become slow in collective performance and showed signs of lack of cooperation between the team members during offense, thus leading to tragic results. This comes in confirmation of the author's observations and observation is the beginning of scientific settlement. This is the essence of this extensive study.

The author also noticed that the juniors' carrying out of combined skillful offensive performances is not smooth enough and is rather slow. Although some of them do well and perform each individual skill in an excellent manner, most of them cannot perform many offensive skills smoothly. This may be due to the traditional method followed by most coaches in teaching the combined offensive skillful training providing each skill individually instead of combining and mixing performances as done in the actual playing situations during the match, thus decreasing the efficiency of performances. This was why he author conducted a pilot study to make a list of the combined offensive skillful performances used in France World Championship of 2001 in order to identify the following points:

1. Forms and types of combined offensive skills used by the different teams on the international level;
2. The speed of performing combined offensive skills by the national team of Egypt;
3. The speed of performing combined offensive skills by other international teams.

The study resulted in listing the forms and types of the combined offensive skills used in the World Championship and showed that most combined offensive skills are performed in a combined manner and that the average speed of performing the combined offensive skills by rival teams is higher than the average speed of performing the defensive skills by the Egyptian national team in all matches. Results also showed that the average speed of performing combined offensive skills by the Egyptian national team is lower than the average speed of performing defensive performances by rival teams, thus leading to inefficiency of Egyptian offenses from different playing positions in most matches. Attachment I shows details of the study.

This research is important because of the fact that slow performance of combined offensive skills by the Egyptian team, opposed by quick performance of combined defensive skills by rival teams, leads to the ineffectiveness of Egyptian offenses. The slow performance of the Egyptian national team and the higher average time of performance, compared to international counterparts, in addition to the very few combined offensive skills mastered by the Egyptian team, may be attributed to the fact that Egyptian players did not come in contact with such combined skills at an early age so that they might reach the stage of automatic quick performance of such skills.

To address this problem, juniors must be trained at an early age to perform such combined fake skills dictated by the actual situations during the match. This conforms with opinions expressed by Amrallah el Basaty (1994), Farnarfik et al.(1997), (1998), Carlos Garcia (2000) and Mohamed Keshk & Amrallah el Basaty (2002) (6:34), (18:213), (37:605), (24:54). Hence the idea of this research: "The effect of developing some visual capabilities and combined offensive skillful performances on the effectiveness of offence in handball", which aims at increasing the effectiveness of offense in general, and the combined offensive skillful performance at an early age, thus reaching a speedy performance which shows accuracy and coordination. The paper also aims at providing a directed training program to develop visual capabilities and the combined offensive skillful performances for the under 16 year-old junior handball players. The paper is also an attempt to present a new concept of measuring skillful offensive performances in a manner that clearly and objectively reflects the performance level of players based on the required performances of actual situations during matches.

All this gives the research an important dimension of directing and rationalizing the training process to contribute to laying foundations for the training staff in order to upgrade the level of combined offensive skillful performances for the under 16 year-old junior handball players.

1/2 Objective of the research

Upgrading the effectiveness of offense in the different playing positions for the national team handball juniors through the development of the speed of combined offensive skillful performances and the visual capabilities, through the achievement of the following aims:

1/2/1 – identifying, in quantity, quality and type, of the visual capabilities and combined offensive skillful performances used in handball.

1/2/2 – designing a training program to develop the visual capabilities and combined offensive skillful performances for junior handball players.

1/2/3 – identifying the effect of the training program on developing some visual capabilities and the visual capabilities and combined offensive skillful performances for junior handball players.

1/2/4 – designing situational tests to measure the speed of the visual capabilities and combined offensive skillful performances.

1/3 – research hypotheses

1/3/1 - combined offensive skillful performances can be listed (in quantity and quality).

1/3/2 – there are statistically significant differences in the average visual capabilities and the combined offensive skillful performances of the control group between the pre-measurements and the post-measurements, favoring post-measurements.

1/3/3 - there are statistically significant differences in the average visual capabilities and the combined offensive skillful performances of the experimental group between the pre-measurements and the post-measurements, favoring post-measurements.

1/4 Research terminology

Visual capabilities:

- Eye-Hand Body Coordination

This means how the hand or body responds to information gathered through the eye, and is an important component in most sport games because it affects the timing and body control (procedural definition).

- Dynamic Visual Acuity

This means seeing objects accurately while the player moves, i.e., the object is stationary and the player is moving (48).

- Static Visual Acuity

This means seeing objects accurately from a stationary view, i.e., the player and the object are stationary (48).

- Visual Tracking

This means "the flexible and quick movement of the eye to follow the object". (20)

- Peripheral Vision

This means perceiving everything surrounding the object, whether persons or objects without losing concentration on the objects. (49)

Visual Training

This is one of the training methods which include some exercises from the eye aiming at making changes in the eye responses to improve the visual functions of players, thus leading to developing the basic skills and achieving the best results (procedural definition).

Offensive skills

These are all the skills performed by the players when in possession of the ball to build up an offense against the ball of the rival team to score a goal (procedural definition).

2/0 Research procedures

Based on the research procedures, the following steps were taken:

2/1 Method

2/1/1

The experimental method: using the two-groups design, with one control group and one experimental group to measure the effectiveness of the proposed training program to achieve the main research goals.

2/2 Research sample

The research sample consisted of 36 national teams juniors born in 1998 and twelve matches of the 2013 Spain World Championship were analyzed, with approximately similar tactical levels to avoid discrepancy in the percentage of performing the combined offensive skills. Table 1 shows details of the sample.

Table 1
Research sample items

Sample carrying out the program The experimental group	Sample of analyzing matches	Total sample of analyzed matches
36 national teams juniors born in 1998 with homogeneity of sample tested for the training age, the temporal age, height and weight	Egypt × Croatia Egypt × Spain Egypt × Hungary Egypt × Slovenia Slovenia × Russia Germany × Spain Hungary × Denmark Croatia × France Slovenia × Spain Croatia × Denmark Croatia × Slovenia Denmark × Spain	12 matches

2/3 Data collecting tools

2/3/1 Observation form: used in analyzing matches to identify offensive skills in handball

3/3/2 Tests

Previous studies where reviewed and used to find the anthropometric measurements, the visual tests and tests designed to measure the level of performing the offensive skills appropriate for this study.

The following measurements and tests were found to be appropriate to the study:

1. Anthropometric measurement:

- Weight
- Height
- Temporal age

2. Visual tests:
- Peripheral vision
- Visual tracking
- Static visual acuity
- Dynamic visual acuity
- Eye-hand body coordination

4- Combined skillful performances tests:

1. Combined skillful performances test for the center back position (playmaker).
2. Combined skillful performances test for the right wing and the circle.
3. Combined skillful performances test for the left wing and the circle.
4. Combined skillful performances test for the right back.

2/4 Research plan

In order to achieve the research objective, i.e., the effect of developing some visual capabilities and combined offensive skillful performances on the effectiveness of offence in handball, it was necessary to take the following steps:

2/4/1 designing the proposed training program through the following steps:

(Planning the training program, identifying the total number program hours, choosing the training components and distributing them, identifying the exercises of the training program the distribution of the training components in the general preparation stage, the special preparation stage and pre-competition stage. The initial concept of the training program was then referred to experts, and the program was modified according to their opinions and the actual program was then applied).

2/4/2 - building up a set of tests measuring the visual capabilities and the combined offensive skillful performances.

The scientific coefficients for validity and reliability and objectivity were found for these tests by conducting a pilot study to find these coefficients.

2/4/2/1 – the pilot study to the validity and reliability and objectivity coefficients of visual tests and combined offensive skills tests.

The aim of the pilot study

Ensuring the scientific fitness of the proposed tests to measure the combined offensive skillful performances of the under 16 year-old handball juniors (to find validity and reliability).

- Sample of the pilot study

The sample consisted of 36 handball players, 18 from the under 16 years-old Egyptian national team for the distinguished sample, and 18 players from the Olympic Club for the non-distinguished sample.

Results of the pilot study

Although the research team submitted the proposed tests to experts in handball and made sure of their opinions, it was found peripherable to find validity by using the discrimination method, calculating discriminated validity coefficient, by calculating the differences (T) between the distinguished group and the non-distinguished group based on the opposed groups method (Tables 3 and 4)

The test-re- test method was used to find the reliability coefficient by finding the correlation coefficient between scores obtained from the first application and the second application by applying the proposed tests to the same pilot study sample using the same conditions, order and method of measurement (Tables 5 and 6).

Table 3
Validity coefficient of visual variables (N=18)

N	Variables	Tests	Unit	Distinguished group		Non-distinguished group		R
				mean	Standard deviation	mean	Standard deviation	
1	Visual	Eye-hand body coordination	degree	13.4	1.174	10.300	0.823	* 0.891
2		Static visual acuity	degree	13.7	1.160	10.200	0.788	*0.870
3		Dynamic visual acuity	second	1.3	0.483	0.800	0.421	* 0.503
4		Peripheral vision	degree	6.4	1.174	3.600	1.07	* 0.795
5		Visual tracking	degree	1.4	0.564	0.900	0.316	* 0.653

N1 = N2 = 18

* significant at 0,05 and liberty degree 18 tabular R value = 0.063

Table 4
The T value differences between average performances by the distinguished and the non-distinguished in the combined offensive tests (test validity)

Variables		Centre back test	Right wing and circle test	Left wing and circle test	Right back test	Left back test
practicing	Mean	29.10	59.75	56.54	84.85	84.87
	Standard deviation	8.91	13.93	9.88	17.44	18.44
Non-practicing	Mean	124.21	144.56	172.94	252.04	251.07
	Standard deviation	12.59	24.94	15.77	23.30	24.32
T value		**32.29	14.51**	29.11**	23.51**	24.26**

** all these values are significant at the 0.01 level

Table 4 shows that there are statistically significant differences between the distinguished and the non-distinguished players of handball at the significance level of 1% favoring the distinguished group. This means that the test set distinguished between the distinguished and the non-distinguished groups of handball players, i. e., the tests are valid and measured what they were designed to measure.

Table 5
Reliability coefficient of visual variables (N=18)

variables		1st application		2nd application		Correlation coefficient
		mean	Standard deviation	mean	Standard deviation	
Visual variables	Eye-hand body coordination	13.4	1.174	14.2	1.033	0.646
	Static visual acuity	13.7	1.160	13.9	1.159	0.903
	Dynamic visual acuity.	1.3	0.483	1.4	0.516	0.697
	Peripheral vision	6.4	1.174	6.5	1.179	0.720
	Visual tracking	1.4	0.564	1.6	0.516	0.737

Correlation coefficient at eh level 0.05 = 20.63

Table 6
correlation coefficient between 1st and 2nd applications (test reliability)

combined feint performances tests for the positions	correlation coefficient
1- Centre back	0.938
2- Right wing and circle	0.967
3- left wing and circle	0.958
4- right back	0.998
5- left back	0.999

Table 6 shows reliability coefficient which was found by repeating the same tests with the same players. Correlation coefficient of the tests was of high significance at the level of 1% between the first and second applications, showing a value of 0.938, 0.967, 0.958, 0.998, and 0.999 for the tests of the combined offensive skillful performances of the centre back position, right wing and circle position, left wing and circle position, right back position and left back position, respectively, thus proving reliability of the tests

** all these values are significant at the 0.01 level

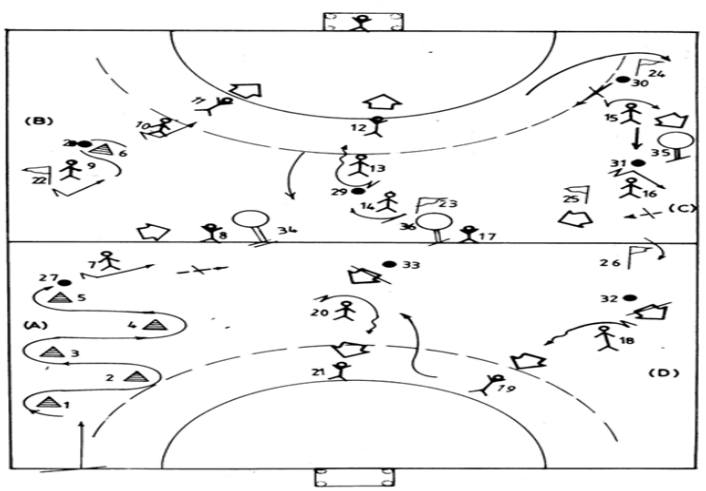
Table 7
mean and standard deviation of scores given by referees (1st and 2nd) «objectivity coefficient»

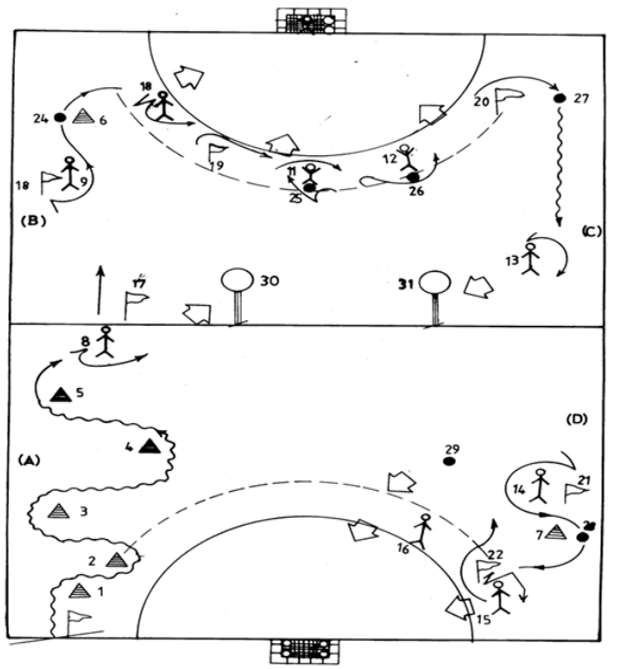
variables		Centre back test	Right wing and circle test	Left wing and circle test	Right back test	Left back test
Number 1	Mean	29.00	59.10	56.49	84.50	85.51
	Standard deviation	8.92	15.90	9.93	16.92	17.93
Number 2	Mean	29.20	59.40	56.58	85.20	86.20
	Standard deviation	8.89	11.95	9.84	17.96	18.96
T value		2.01	0.69	0.70	0.75	0.79

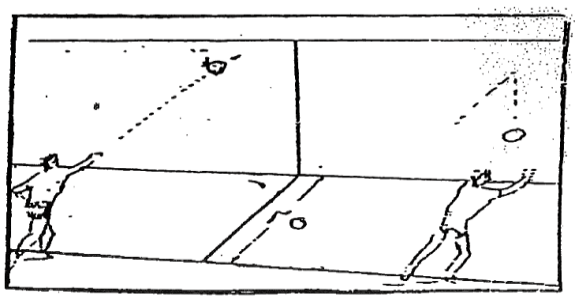
Table 7 shows that the test used were objective as the T test value of the differences between the first and second referees were insignificant in the five tests, thus proving objectivity of the tests used.

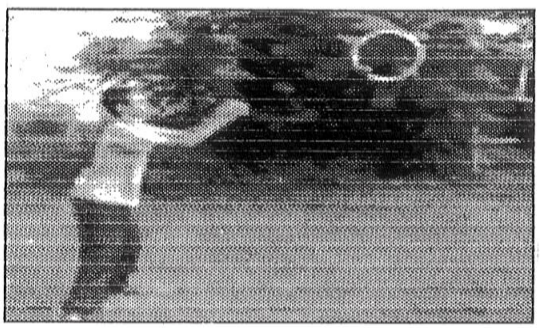
2/4/3 - Conducting the pre-measurements by applying the designed combined offensive skillful tests and the visual capabilities to the experimental and control groups, and finding equivalence for research variables and variables of height, weight, age and years of practice.

Following is a model of the combined skillful tests and the visual tests used in this research.

Title of test	test of the combined feint skillful performances for the left back position
Aim	measuring the effectiveness of the combined feint skillful performances for the left back position
form and plan of the test	
test specifications	The player stands behind the start line, on hearing the whistle, he starts a quick zigzag continuous run without the ball between cones 1 to 5 towards the ball placed on the ground 27, picking it, with a right–to- left faking movement, passing silhouette figure 7 from the left side to make a feint passing, then doing a sharp passing through the loop fixed on the pole by jumping. forewards passing silhouette figure 8 from the right. The player moves on in the same direction, touching flag 22 to make sure he started feint running correctly, then runs changing direction to pass on the left side of silhouette figure 9 towards the ball 28 which he will pick from the right of cone 6 with a left–to- right faking movement, passing silhouette figure 10 from the left side, then shooting towards the goal angles shown by jumping high over silhouette figure 11. the player then moves back to face silhouette figure 14, touching flag 22 to make sure he started feint running in the right manner, changing direction to pass on the left side of silhouette figure again towards the ball 29 which he will pick preparing to make a right-to-left faking movement, doing a high armswing passing silhouette figure 13 from the right side then shooting through the loops shown fixed by jumping high over silhouette figure 12. The player then runs on the left of flag 24 to pick the ball 30 doing a feint pass, then a right-to-left feint movement, then doing a sharp passing through the loop fixed on the pole by jumping forewords passing silhouette figure 12. The player then runs and passes on the left side of flag 24 to pick the ball 30, doing a feint pass then a right-to-left feint movement, then doing a sharp passing through the loop fixed on the pole by jumping forewords passing silhouette figure 15 on the right side towards the ball 31 which he picks in front of silhouette figure 16, preparing for a left-to-right feint movement doing a high armswing passing silhouette figure 13 from the right side to do a feint pass then a sharp passing through the loop fixed to the pole by jumping forewords on the left of silhouette figure 17. The player moves on in the same direction towards the ball 32 which he picks doing a feint pass, then a left-to-right feint movement passing silhouette figure 18 from the left side and shooting towards the goal angles shown by jumping high over silhouette figure 19. Finally, the player runs fast to the middle of the playing ground towards the ball 33 which he picks facing silhouette figure 20 to make a feint shooting from the knee level, the a right-to-left feint movement, doing a high armswing passing silhouette figure 20, bouncing once then shooting towards the goal angles shown over the last silhouette figure 21.
Scoring system	• the player does the test in three trials with a suitable rest in between. • To record the scores obtained, the total time of the whole cycle of the test is measured for each of the three trials. • The least performance time of the three trials is identified. • Time spent in breaking the performance rules of the test recording form is added to the time spent in performing the whole cycle of the test.

Title of test		test of the combined skillful performances for the left wing and circle positions
aim		measuring the effectiveness of the combined skillful performances for the left wing and circle positions
form and plan of the test		
test specifications		The player stands holding the ball behind the start line and on hearing the whistle starts running and dribbling the ball continuously in a zigzag line between cones 1 and 5. When facing silhouette figure 8, the player makes a left-to-right feint and a sharp passing through the loop fixed to the pole by jumping forewords. The player moves on in the same direction to face silhouette figure 9, touching flag 18 to make sure he started the feint running correctly, changing direction to pass to the left of the silhouette figure again towards the ball 24 which he picks on the right side of cone 6, making a left-to-right feint in front of silhouette figure 18 and shooting towards the goal angles shown by jumping forewords going beyond silhouette figure 10 from the left side of the left wing position. The player then performs a cutting behind flag 19 to pick the ball 25 to be faced with silhouette figure 11 from the back and performs a feint movement rotating against the shooting arm and shooting towards the goal angles shown by jumping forewords. The player then runs towards the ball 26 which he picks, performing a feint movement rotating in the direction of the shooting arm, then rotating in the direction against the shooting arm and shoots towards the goal angles shown by jumping forewords. The player then runs around flag 20 to pick the ball 27, continuously dribbling the ball in preparation for a right-to-left feint movement in front of silhouette figure 13 and a sharp shooting through the loop fixed to the pole by jumping high. The player then moves on to face silhouette figure14, touching flag 12 to make sure he started the feint running correctly, changing direction to pass on the left side of silhouette figure again towards the ball 28 which he picks on the right side of cone 7, making a right-to-left feint, with a high armswing, going beyond silhouette figure 15 from the right side, then shoots through the loops shown from the left wing position by jumping high. The player then runs fast to the middle of the playing ground facing the goal again to pick the ball 29, performing a feint movement by shooting from running then shooting towards the loops shown by jumping high from the left of silhouette figure 16.
Scoring system		Three seconds are added to each error.

No	Visual tests
1	Eye-hand body coordination: ❖ Aim of the test: Measuring eye-hand coordination ❖ Tools: Tennis balls – a smooth wall – draw a line 5 meters from the wall ❖ Method of performance: The person performing the test would stand in front of the wall behind the line drawn on the floor and the test runs as follows: • Throwing the ball 5 times consecutively with the right hand, with the person performing the test receiving the bouncing ball with the same hand. • Throwing the ball 5 times consecutively with the left hand, with the person performing the test receiving the bouncing ball with the same hand. • Throwing the ball 5 times consecutively with the right hand, with the person performing the test receiving the bouncing ball with the left hand. • Throwing the ball 5 times consecutively with the left hand, with the person performing the test receiving the bouncing ball with the right hand. ❖ Scoring system: • The tested person will obtain one score for each correct trial. • The final score of the test is 20 scores. 

No	Visual tests
2	Dynamic visual acuity: ❖ aim of the test: measuring th Dynamic visual acuity ❖ Tools: A plastic ring with three colored balls placed at equal distances ❖ Performance method: The player is to pick the ball with the color chosen by the person performing the test. ❖ Scoring system: Each palyer tested is given three trials from the right and three trials from the left. Each successful trial to pic the correct bal will get one score. 

4/4/2

2/4/4 – the proposed program was applied to the experimental group, while the traditional program was applied to the control group, this went on for 13 weeks in the period 27/9/2014 – 7/1/2015, in the indoor hall of the Cairo International Stadium.

Following are models of the training weeks applied to the experimental group (week 5 –week 9 – week 13).

2/4/5 - Taking the post-measurements by applying the proposed combined tests to the experimental and control groups.

2/4/6 – Finding the differences between pre-measurements and post-measurements for the two groups in the components of the combined offensive skillful tests and the visual tests.

2/4/7 – calculating the percentages of improvement between the pre-measurements and post-measurements of the two groups.

5/0 - Results presentation and discussion.

5/1 the experimental group before and after the experiment:

Table 11 Mean, standard deviation and (T) value of the differences between players results in the pre-measurement and post-measurement for the experimental group and the percentage of improvement in combined tests and their components

Table 8

Daily distribution of program content over preparation elements during daily units (for week 5)

Performance elements and amount of load direction	Warm up			Physical preparation			
	Load direction	Load volume (in minutes)	Figure number	Performance direction	Load amount	Load volume (in minutes)	Figure number
Day 1	Individual warm-up with the ball	15	1	General endurance Feinted physical	Medium	55	89 44
Day 2	Dual with the ball	15	3	Strength endurance Feinted physical	Maximum	45	92 48 49 50
Day 3	Individual with the ball	15	1	Speed endurance Feinted physical	Less than maximum	65	94 78 79 80
Day 4	Dual with the ball	15	4	General endurance Feinted physical	maximum	45	89 44
Day 5	Individual with the ball	15	2	Great strength Feinted physical	Medium	90	96 48 49 50
Day 6	Dual with the ball	15	4	Strength endurance Feinted physical	medium	90	91 55 56 57

Performance elements and amount of load direction	Visual capabilities						
	Eye hand coordination	Visual tracking	Peripheral vision	Static visual acuity	Dynamic visual acuity	Load volume (in minutes)	Figure number
Day 1	passing and receiving; shooting : by running, by pivoting, by jumping high; dribbling continuously; receiving with ring			passing and receiving; shooting : by running, by pivoting, by jumping high; dribbling inside the ring	passing and receiving; shooting : by running, by pivoting, by jumping high; dribbling continuously; moving according to the color of the ball	5	111 112 124 121
Day 2	passing and receiving; shooting : by running, by pivoting, by jumping high; dribbling continuously; receiving with ring			passing and receiving; shooting : by running, by pivoting, by jumping high; dribbling inside the ring	passing and receiving; shooting : by running, by pivoting, by jumping high; dribbling continuously; moving according to the color of the ball	10	111 112 124 121 123 124
Day 3	passing and receiving; shooting : by running, by pivoting, by jumping high; dribbling continuously; receiving with ring			passing and receiving; shooting : by running, by pivoting, by jumping high; dribbling inside the ring	passing and receiving; shooting : by running, by pivoting, by jumping high; dribbling continuously; moving according to the color of the ball	15	113 114 124 123
Day 4	passing and receiving; shooting : by running, by pivoting, by jumping high; dribbling continuously; receiving with ring			passing and receiving; shooting : by running, by pivoting, by jumping high; dribbling inside the ring	passing and receiving; shooting : by running, by pivoting, by jumping high; dribbling continuously; moving according to the color of the ball	10	113 114 120 123
Day 5	passing and receiving; shooting : by running, by pivoting, by jumping high; dribbling continuously; receiving with ring			passing and receiving; shooting : by running, by pivoting, by jumping high; dribbling inside the ring	passing and receiving; shooting : by running, by pivoting, by jumping high; dribbling continuously; moving according to the color of the ball	10	113 114 123 124
Day 6	passing and receiving; shooting : by running, by pivoting, by jumping high; dribbling continuously; receiving with ring			passing and receiving; shooting : by running, by pivoting, by jumping high; dribbling inside the ring	passing and receiving; shooting : by running, by pivoting, by jumping high; dribbling continuously; moving according to the color of the ball	5	114 115 120 123 124

Performance elements and amount of load direction	Combined offensive skillful performances		
	Performance direction	Load volume (in minutes)	Figure number
Day 1	Feint without ball then receiving then feint by passing then dribbling then a right-left-right feint then shooting by jumping forwards (right back); Receiving then feint by shooting by jumping high then dribbling then shooting by jumping high (center back); Receiving then feint by shooting by running at the trunk level then left-right-left feint then shooting by jumping high (left back); feint without ball then receiving then right-left-right feint then shooting by jumping forwards; Feint without ball then receiving then left-right-left feint then shooting by jumping forwards (left wing)	15	128 127 146 147 151
Day 2	Feint without ball then receiving then feint by passing then dribbling then a right-left-right feint then shooting by jumping forwards (right back); Receiving then feint by shooting by jumping high then dribbling then shooting by jumping high (center back); Receiving then feint by shooting by running at the trunk level then left-right-left feint then shooting by jumping high (left back); feint without ball then receiving then right-left-right feint then shooting by jumping forwards; Feint without ball then receiving then left-right-left feint then shooting by jumping forwards (left wing)	10	128 138 147 151
Day 3	Receiving then feint by shooting by jumping high then dribbling then shooting by jumping high (center back); Receiving then feint by shooting by running at the trunk level then left-right-left feint then shooting by jumping high (left back) Integration	15	137 146
Day 4	Receiving then left-right-left feint then shooting by jumping forwards (center back); Feint without ball then receiving then left-right-left feint then shooting by jumping high (left back) Integration	10	138 140
Day 5	Receiving then feint by shooting by jumping high then dribbling then shooting by jumping high (center back); Receiving then feint by shooting by running at the trunk level then left-right-left feint then shooting by jumping high (left back) Integration	15	137 146
Day 6	Receiving then left-right-left feint then shooting by jumping forwards (center back); Feint without ball then receiving then right-left feint then shooting by jumping high (left back) Integration	5	138 140

Performance elements and amount of load direction	Tactical preparation			Combined offensive skillful performances within offensive formations		
	Performance direction	Load volume (in minutes)	Figure number	Performance direction	Load volume (in minutes)	Figure number
Day 1	Fast break; cutting between two neighboring players on the right then shooting by jumping forwards; feint without ball then receiving then left-right-left feint then shooting by jumping forwards	20	171 161 189	2 attackers against 1 defender2x1); 1 attacker against 1 defender (1x1)	10	170 163 164
Day 2	Half exchange of positions between neighboring players	20	195	2 attackers against 1 defender (2x1); 1 attacker against 1 defender (1x1)	10	170 163 164
Day 3	Fast break	20	158 161 181	3 attackers against 2 defenders (3x2); 1attacker against 1 defender (1x1)	10	173 163 164
Day 4	Cutting between non-neighboring players	15	193	3 attackers against 2 defenders (3x2); 1 attacker against 1 defender (1x1)	10	173 163 164
Day 5	Half exchange of positions between non-neighboring players	20	197	2 attackers against 1 defender (2x1); 1 attacker against 1 defender (1x1)	10	171 163 164
Day 6	Half exchange of positions between neighboring players; Half exchange of positions between non-neighboring players	15	196 198	1 attacker against 1 defender (1x1); 2 attackers against 1 defender (2x1)	10	163 164 171

Table 9

Daily distribution of program content over preparation elements during daily units (for week 9)

Performance elements and amount of load direction	Warm up			Physical preparation				Visual capabilities							Combined offensive skillful performances			Tactical preparation			Combined offensive skillful performances within offensive formations		
	Load direction	Load volume (in minutes)	Figure number	Performance direction	Load amount	Load volume (in minutes)	Figure number	Eye-hand coordination	Visual tracking	Peripheral vision	Static visual acuity	Dynamic visual acuity	Load volume (in minutes)	Figure number	Performance direction	Load volume (in minutes)	Figure number	Performance direction	Load volume (in minutes)	Figure number	Performance direction	Load volume (in minutes)	Figure number
Day 1	Dual with ball	20	3	Combined: General endurance; Strength endurance; Feint ohysical	medium	25	91 85 51 52 53	Passing and receiving; Shooting by running, pivoting, jumping high, jumping forwards; Dribbling continuously; Feint by dribbling then shooting	Passing and receiving; Shooting by running, pivoting, jumping high, jumping forwards; Dribbling continuously; Following the sticker		Passing and receiving; Shooting by running, pivoting, jumping high, jumping forwards; Dribbling continuously; Eye-adaptation	Passing; receiving; Shooting by running, pivoting, jumping high; Shooting at a moving target in front of the goal	20	117 118 120	Receiving then left-right feint rotating the arm then dribbling then feint by passing then shooting by jumping (right back); Receiving then right-left feint rotating the arm then shooting against the shooting arm (center back); Feint without ball then receiving then right-left feint rotating the arm then shooting by jumping forwards (left back); Receivin g then left-right feint rotating the arm shooting by jumping forwards(right back); receiving the right-left feint rotating the arm then shooting by jumping forwards (left back)	25	130 134 144 149 152	Quick fast break; equally	20	183	3 attackers against 2 defenders (3x2); 3 attackers against 3 defenders (3x3); 2 attackers against 2 defenders (2X2)	10	173 174 172
Day 2	Dual from playing positions	20	5	Combined: Speed; Agility; physical	High maximum	25	98 55 56 57	Passing and receiving; Shooting by running, pivoting, jumping high, jumping forwards; Dribbling continuously; Feint by dribbling then shooting	Passing and receiving; Shooting by running, pivoting, jumping high, jumping forwards; Dribbling continuously; Following the sticker		Passing and receiving; Shooting by running, pivoting, jumping high, jumping forwards; Dribbling continuously; Eye-adaptation	Passing; receiving; Shooting by running, pivoting, jumping high; Shooting at a moving target in front of the goal	20	118 119 126	Receiving then left-right feint rotating the arm then dribbling then feint by passing then shooting by jumping (right back); Receiving then right-left feint rotating the arm then shooting against the shooting arm (center back); Feint without ball then receiving then right-left feint rotating the arm then shooting by jumping forwards (left back); Receivin g then left-right feint rotating the arm shooting by jumping forwards(right back); receiving the right-left feint rotating the arm then shooting by jumping forwards (left back)	25	130 134 143 149 152	Quick fast break; Increasing number of attackers	20	184	3 attackers against 2 defenders (3x2); 1 attacker against 1 defender (1x1); 3 attackers against 3 defenders (3x3)	10	173 163 164 174
Day 3	Dual with ball	20	4	Combined: Physical; Individual; Explosive power; Power with speed	medium	25	90 73	Passing and receiving; Shooting by running, pivoting, jumping high, jumping forwards; Dribbling continuously; Feint by dribbling then shooting	Passing and receiving; Shooting by running, pivoting, jumping high, jumping forwards; Dribbling continuously; Following the sticker		Passing and receiving; Shooting by running, pivoting, jumping high, jumping forwards; Dribbling continuously; Eye-adaptation	Passing; receiving; Shooting by running, pivoting, jumping high; Shooting at a moving target in front of the goal	25	116 118 126	Receiving then left-right feint rotating the arm then dribbling then feint by passing then shooting by jumping (right back); Receiving then right-left feint rotating the arm then shooting against the shooting arm (center back); Feint without ball then receiving then right-left feint rotating the arm then shooting by jumping forwards (left back); Receivin g then left-right feint rotating the arm shooting by jumping forwards(right back); receiving the right-left feint rotating the arm then shooting by jumping forwards (left back)	25	130 134 144 149 152	Blocking between two neighboring players	25	206	1 attacker against 1 defender (1x1); 2 attackers against 1 defender (2x1); 2 attackers against 2 defenders (2X2)	10	163 164 171 172
Day 4	Dual from playing positions	20	5	Combined: Coordination; Great strength; Feint physical	maximum	25	90 77	Passing and receiving; Shooting by running, pivoting, jumping high, jumping forwards; Dribbling continuously; Feint by dribbling then shooting	Passing and receiving; Shooting by running, pivoting, jumping high, jumping forwards; Dribbling continuously; Following the sticker		Passing and receiving; Shooting by running, pivoting, jumping high, jumping forwards; Dribbling continuously; Eye-adaptation	Passing; receiving; Shooting by running, pivoting, jumping high; Shooting at a moving target in front of the goal	20	125 126	Receiving then left-right feint rotating the arm then dribbling then feint by passing then shooting by jumping (right back); Receiving then right-left feint rotating the arm then shooting against the shooting arm (center back); Feint without ball then receiving then right-left feint rotating the arm then shooting by jumping forwards (left back); Receivin g then left-right feint rotating the arm shooting by jumping forwards(right back); receiving the right-left feint rotating the arm then shooting by jumping forwards (left back)	10	130 134 145 149 152	Blocking between two neighboring players	20	211	2 attackers against 1 defender (2x1); 3 attackers against 3 defenders (3x3); 1 attacker against 1 defender (1X1)	5	163 164 172 174
Day 5	Dual with ball	20	3	Combined: Agility; Explosive power; Power with speed	medium	25	75 76 90	Passing and receiving; Shooting by running, pivoting, jumping high, jumping forwards; Dribbling continuously; Feint by dribbling then shooting	Passing and receiving; Shooting by running, pivoting, jumping high, jumping forwards; Dribbling continuously; Following the sticker		Passing and receiving; Shooting by running, pivoting, jumping high, jumping forwards; Dribbling continuously; Eye-adaptation	Passing; receiving; Shooting by running, pivoting, jumping high; Shooting at a moving target in front of the goal	30	118 125 126	Receiving then left-right feint rotating the arm then dribbling then feint by passing then shooting by jumping (right back); Receiving then right-left feint rotating the arm then shooting against the shooting arm (center back); Feint without ball then receiving then right-left feint rotating the arm then shooting by jumping forwards (left back); Receivin g then left-right feint rotating the arm shooting by jumping forwards(right back); receiving the right-left feint rotating the arm then shooting by jumping forwards (left back)	30	130 134 145 149 152	Exchanging positions between neighboring players; Exchanging positions between non-neighboring players	30	200 202 203	3 attackerws against 2 defenders (3x2); 3 attackers against 3 defenders (3x3); 1 attacker against 1 defender (1X1)	15	173 174 163 164
Day 6	Dual from playing positions	20	5	Combined: Speed; Speed endurance; Feint physical	medium	25	80 81 99 100	Passing and receiving; Shooting by running, pivoting, jumping high, jumping forwards; Dribbling continuously; Feint by dribbling then shooting	Passing and receiving; Shooting by running, pivoting, jumping high, jumping forwards; Dribbling continuously; Following the sticker		Passing and receiving; Shooting by running, pivoting, jumping high, jumping forwards; Dribbling continuously; Eye-adaptation	Passing; receiving; Shooting by running, pivoting, jumping high; Shooting at a moving target in front of the goal	20	119 125 126	Receiving then left-right feint rotating the arm then dribbling then feint by passing then shooting by jumping (right back); Receiving then right-left feint rotating the arm then shooting against the shooting arm (center back); Feint without ball then receiving then right-left feint rotating the arm then shooting by jumping forwards (left back); Receivin g then left-right feint rotating the arm shooting by jumping forwards(right back); receiving the right-left feint rotating the arm then shooting by jumping forwards (left back)	20	130 134 145 149 152	Extended fast break	10	158 159 181	3 attackers against 3 defenders (3x3); 3 attackers against 2 defenders (3x2); 1 attacker against 1 defender (1X1)	5	174 173 163 164

Table 10

Daily distribution of program content over preparation elements during daily units (for week 13)

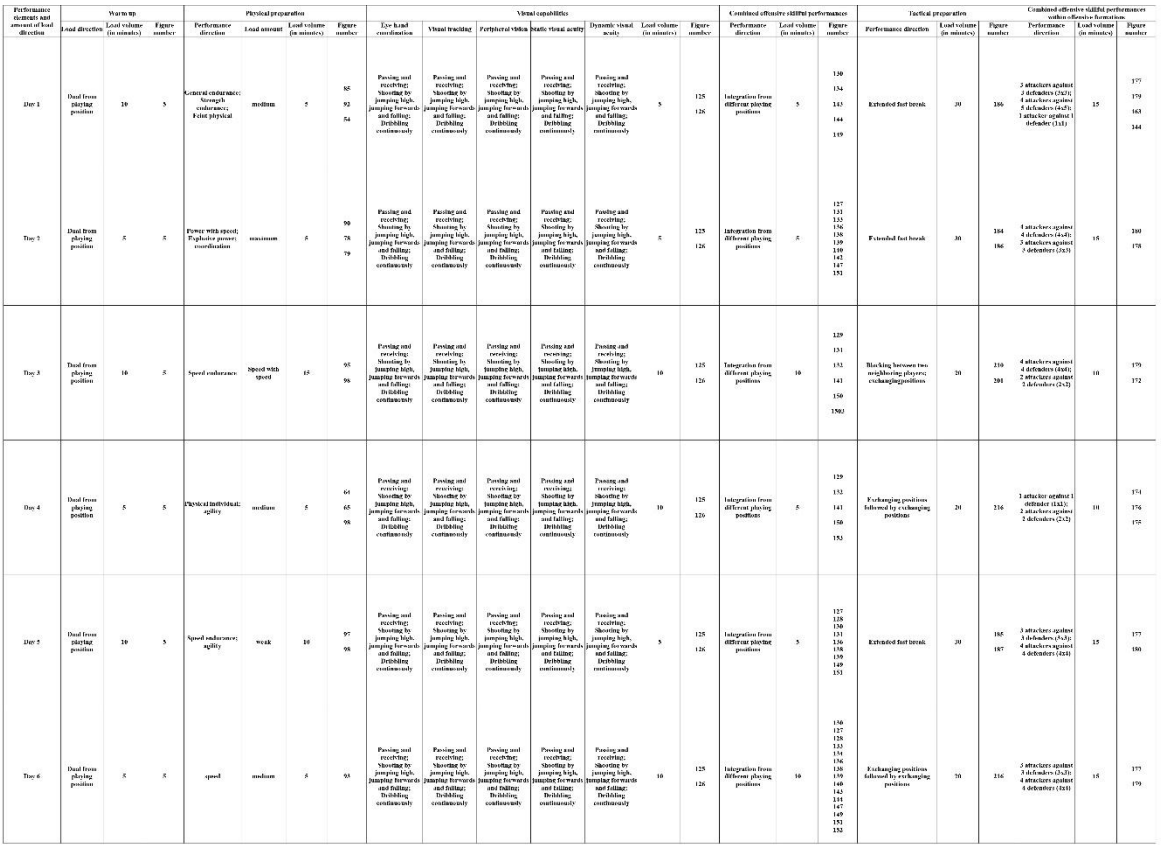


Table 11

The significance of differences and the (T) value of the experimental group in variables studied (n=18)

Variables		Pre-measurement		Post-measurement		Difference	(T) Value	Significance
		Mean	Standard deviation	Mean	Standard deviation			
Visual variables	Eye-hand coordination	13.3	0.949	19.4	1.713	6.1	9.342	Significant
	Static visual acuity	13.7	1.252	19.3	2.001	5.6	7.116	Significant
	Dynamic visual acuity	1.3	0.483	2.5	0.527	1.2	5.042	Significant
	Peripheral vision	6.2	1.229	10.4	1.174	4.2	7.420	Significant
	Visual tracking	1.8	0.789	3.4	0.516	1.6	3.865	Significant

The tabular (T) value at 0.05 level = 1.83

Table 11 shows the significance of differences between the pre-measurement and post-measurement favoring post-measurement in all research variables.

The tables shows that there are statistically significant differences between the pre-measurement and post-measurement of the experimental group favoring post-measurement at a significant level of 0.05 in the selected visual variables (eye-hand coordination, static visual acuity, dynamic visual acuity, peripheral vision, visual tracking), and some combined offensive skills in handball (passing and receiving – dribbling – shooting by jumping high). The author attributes to the fact that the effects caused by the experimental group are due to the effect of the proposed program of visual exercises, especially the offensive skills which are the basis of this research.

Table 12
The significance of the differences and the (T) value between the experimental group and the control group in the post-measurement of the variables studied

Variables		Pre-measurement		Post-measurement		Difference	(T) Value	Significance
		Mean	Standard deviation	Mean	Standard deviation			
Visual variables	Eye-hand coordination	19.4	1.713	15.7	0.949	3.7	5.666	
	Static visual acuity	19.3	2.001	16.7	1.159	2.6	3.372	Significant
	Dynamic visual acuity	2.5	0.527	1.9	0.316	0.6	2.927	Significant
	Peripheral vision	10.4	1.174	8.3	0.483	2.1	4.965	Significant
	Visual tracking	3.4	0.516	2.3	0.483	1.1	4.661	Significant

The tabular (T) value at 0.05 level = 2.10

Table 12 shows the significance of differences between the experimental group and control group in the post-measurement of all research variables favoring the experimental group.

The table shows that there are statistically significant differences in the post-measurement of the control group and experimental group favoring the experimental group in the visual variables and the offensive skills in handball studied.

The author attributes the improvement in the visual tests and offensive skills in handball in the experimental group to the use of the visual training program which contains general visual exercises and visual exercises related to the nature of skillful performance in handball which led to the improvement of the performance level.

Calder and Noakes (2000) (22) and Mazyn LI et al (2004) (28) stress the fact that the visual tracking training contribute to the improvement of visual capabilities and the skillful performance level.

5/1/1 results of the combined offensive skillful performances (the experimental group)

Table 13
Mean, standard deviation and (T) value of the differences between players' results in the pre-measurement and post-measurement in the experimental group and the percentage of improvement in the combined tests and their components (N=18)

Test title	Pre-measurement		Post-measurement		Difference between means	(T) value	Percentage of improvement
Combined faint skillful performances	- mean	± standard deviation	- mean	± standard deviation			
Playmaker position	65.69	13.85	44.41	3.7	21.27	**5.95	32.39%
Left wing and circle	93.75	7.42	48.32	16.54	45.43	**9.14	48.46%
Right wing and circle	82.34	6.58	53.8	3.45	28.55	**16.16	34.66%
Right back position	111.26	4.65	59.01	23.48	52.25	**9.54	46.96%
Left back position	110.84	5.46	61.05	10.77	49.78	**14.7	44.92%
Average of the total improvement percentage							41.48%

** All these values are significant at the significance level of 0.01

** The tabular (T) value at the level 0.01 = 2.95

Table 13 shows that there is a difference between pre-measurement and post-measurement of the experimental group in the combined tests and their components favoring the post-measurement as the mean and the standard deviation of the test of combined offensive skillful performances for the left wing and circle positions in the pre-measurement were 93.75 and 7.42 respectively, while the mean and standard deviation in the post-measurement were 48.32 and 16.54 respectively. The calculated (T) value of the differences was 9.14, which is significant at the level of 0.01. The improvement percentage was 48.46% favoring the results of the post-measurement. The average of the total improvement percentage was 41.48%.

Table 13 shows that there is a difference between the pre-measurement and the post-measurement of the experimental group in the combined tests and their

components favoring post-measurements. The mean and standard deviation of the test of the combined offensive skillful performances for the right wing and circle positions in the pre-measurement were 93.75 and 7.42 respectively. The arithmetic mean and standard deviation in the post-measurement were (48.32) and (16.54) respectively and the calculated T value of the differences was (9.14), which is significant at the level of 0.01. The improvement percentage was 48.46% favoring the results of the post-measurement. The average of the total improvement percentage was 41.48. the author attributes the significant improvement in the test results of the experimental group to the direct effect of the proposed program which helped juniors acquire a number of the technical requirements needed to practice the game in a distinguished manner that would help upgrade both the technical and physical aspects because it is important for the handball player to possess several visual skills which are various and new and which will help him upgrade his level as player. The reason is that performance in handball involves different, ever changing dynamic situations and is never static because situations are always connected to the rival player's movements and to the different situations of the game. In addition, developing visual skills are reflected in the development of the player's physical attributes, and so it becomes easy to master the new motor skills. In other words there is a correlation between the stock of skills and physical attributes on one hand, and the new skills on the other. Feint and shooting exercises, for instance, are useful in developing the explosive power. Feint exercises during the fast break is useful in developing the speed attribute. The zigzag run exercises and the different feint movements contribute to the development of agility and coordination. This conforms with results reached by Sayed Abdel Maksoud (1986), Amrallah el Basaty (1994), Feldman (1996), Yasser Dabbour (1997), Kamal Darwish et al. (1998), Rackner (1998), Mohamed Shawky Keshk & Amrallah el Basaty (2002). All of them found that possessing various forms of combined motor performances similar to the changing situations of the match allow players to choose the best performances in most of the actual situations and increase their ability to tackle and reach speedy, accurate and coordinated performance. The different playing situations in handball force the players to use combined and multiple forms of motor skills with the ball, including a set of combined motor performances. It is important, therefore, to use training forms closely similar to real competition, because skillful performance in handball involves a set of integrated, inter-connected movements performed by the player according to the requirements of the playing situation in competition to achieve a goal, depending on his physical and skillful abilities. Such requirements are always combined in motor groups of exercises which require an organization of the training processes in such a manner as to allow the player to adapt himself to motor pressures, thus achieving minimum safety, idealism and maximum speed of performance to make the best achievement. (12: 116-118) (7: 2-6) (3: 36) (29 : 19-23) (19: 18-19) (1: 42) (23: 114). This was reflected in the improvement made by players in the results of the combined tests.

5/2 – the control group before and after the experiment on visual capabilities

Mean, standard deviation and T value of the differences between results made by players in the pre-measurement and post – measurement of the control group and the improvement percentage in the combined tests and their components

Table 14

Significance of the differences and T value of the control group in the variables studied (N = 18)

Variables		Pre-measurement		Post-measurement		difference	T value	Significance
		mean	Standard deviation	mean	Standard deviation			
Skillful variables	Passing and receiving	19.4	1.174	20.5	0.707	1.1	2.407	significant
	continuous zigzag dribbling for 30 m to and fro	9.144	0.362	8.953	0.281	0.191	1.248	significant
	Shooting from standing	3.4	0.516	3.7	0.483	0.3	1.271	significant
Visual variables	Eye-hand coordination	13.6	0.699	15.7	0.949	2.1	5.344	significant
	Static visual acuity	13.8	0.632	16.7	1.159	2.9	6.606	significant
	Dynamic visual acuity	1.4	0.516	1.9	0.316	0.5	2.800	significant
	Peripheral vision	6.3	0.823	8.3	0.483	2	5.277	significant
	Visual tracking	1.7	0.675	2.3	0.483	0.6	2.166	significant

The tabular T value at the level of 0.05 = 1.83

Table 14 shows that there are statistically significant differences between the pre-measurement and the post-measurement of the control group favoring the post measurement of the variables studied. This was proved by the T values, which makes it reasonable to attribute these results to circumstances related to the standardization of the training environment as much as possible, in addition to the effect of the training program used and controlling the variables used for the control and the experimental groups. The improvement in the standard of the players in the skillful tests can be attributed to the traditional training program applied to them and the commitment shown by players in regularly attending training and the serious attitude of the trainer who did his best to reach championship levels. The program only contained skillful preparation.

The improvement in the control group players in some visual tests favoring the post-measurement is attributed by the author to the fact that those players watched as the visual program was applied to the players of the experimental group and tried to apply it in a non-scientific manner.

In the author's opinion, the visual training program had a strong and effective impact on the results of the variables studied, whether these are visual or offense-related in handball. A comparison of he results made by the experimental group and by the control group shows that the training program applied for 13 weeks led to the superiority of the experimental group in the research variables.

In this respect, this study conforms with results reached by Mofty Ibrahim (2002) (27) who mentioned the factors affecting attention concentration by players include the use of different senses, especially the sense of vision. It also conforms with the statement by Usama Rateb (2000) (3) that selecting one visual stimulus with specific characteristics in training and ignoring other stimuli would develop the concentration of attention only to one stimulus, while training more than one stimulus in the visual field increases the concentration capacity in the individual by concentrating his or her attention on more than one stimulus.

5/2/1 – the control group before and after the experiment in the combined offensive skillful performances

Table 15

Mean, standard deviation and T value of the differences between results made by players in the pre-measurement and post – measurement of the control group and the improvement percentage in the combined tests and their components (N = 18)

Test title	Pre-measurement		Post-measurement		Difference between the two means	T value	Improvement percentage (%)
combined feint skillful performances	mean -	Standard deviation ±	mean -	Standard deviation ±			
Play-maker position	61.94	4.68	59.24	4.55	2.70	*2.41	%4.36
right wing and circle positions	93.14	5.84	81.37	5.75	11.77	**6.79	12.64%
leftt wing and circle positions	80.49	7.35	77.91	11.66	2.58	0.74	3.20%
Right back position	107.78	4.72	98.17	9.49	9.62	**4.79	8.90%
leftt back position	109.85	5.87	91.69	5.65	18.16	**5.55	16.53%
the average total improvement percentage							9.13%

** all these values are significant at the significance level of 0.05

** the tabular T value at the level of 0.05 = 2.13

** all these values are significant at the significance level of 0.01

** the tabular T value at the level of 0.01 = 2.95

Table 15 shows that there is a difference between the pre-measurement and the post-measurement of the control group in the combined tests and their components, favoring the post-measurement. The mean and standard deviation of the combined offensive performances tests of the left wing in the pre-measurement were 109.85 and 5.87 respectively. The median and standard deviation in the post-measurement were91.96 and 5.65 respectively and the calculated T value of the differences was 9.55, which is significant at the significance level of 0.01. the improvement percentage was 16.53% favoring the results of the post-measurement. Total improvement percentage was 9.13%.

This significant improvement in the test results in the control group is attributed by the author to the effect of the technical planning program to train the 13 – 17

year-old juniors (the traditional program) which was based on providing players with as many skillful and tactical performances as possible whether the player should master such performances individually or in groups so that he would reach the stage of automatic performance through repetition during the training process, concentrating on developing all skillful and tactical requirements within the framework of speed of performance and enduring performing such a speed. This conforms with results reached by Khaled Hammouda & Yasser Dabbour (1995), Feldman (1997), Rackner (1998), Garcia (2000), (21 : 69-71), (36: 4) (42 : 1-2), (37 : 3).

4/3 – the experimental and the control groups after the experiment:

Table 16

The mean, standard deviation, the difference between the two means and the calculated T value between the control and the experimental groups in the combined tests and their components

Table 16

Improvement percentage of the post-measurement over the pre-measurement in the experimental group in the variables studied

variables		Pre-measurement	Post-measurement	Improvement percentage
		mean	mean	
Visual variables	Eye-hand coordination	13.3	19.4	31.443
	Static visual acuity	13.7	19.3	%29.016
	Dynamic visual acuity	1.3	2.5	%48
	Peripheral vision	6.2	10.4	40.385
	Visual tracking	1.8	3.4	%47.059

Table 17

Improvement percentage of the post-measurement over the pre-measurement in the control group in the variables studied

variables		Pre-measurement	Post-measurement	Improvement percentage
		mean	mean	
Visual variables	Eye-hand coordination	13.6	15.7	%13.376
	Static visual acuity	13.8	16.7	%17.365
	Dynamic visual acuity	1.4	1.9	%26.316
	Peripheral vision	6.3	8.3	%37.5
	Visual tracking	1.7	2.3	%26.087

Table 18

Improvement percentage of the experimental group over the control group in the variables studied

Variables		Experimental group	Control group	Improvement percentage
		no	no	
Visual variables	Eye-hand coordination	19.4	15.7	%19.072
	Static visual acuity	19.3	16.7	%13.472
	Dynamic visual acuity	2.5	1.9	%24
	Peripheral vision	10.4	8.3	%20.192
	Visual tracking	3.4	2.3	%32.353

Table 18 shows improvement percentages of the post measurement over the pre-measurement in all research variables of the experimental group. Table 17, on the other hand, shows the improvement percentage of the post measurement over the pre-measurement in the control group. This latter improvement is less than the improvement in the experimental group as a result of the use of the visual training program by the experimental group.

Table 18 also shows the improvement percentage of the experimental group over the control group in the post-measurement of the variables studied, which is attributed by the author to the effect of the visual training program in improving the performance of the combined offensive skills in handball and to the fact that visual exercises are important in the practice of sports activity as they provide an opportunity to reach the stage of competition and winning championships, whether theses are national or continental. Provided the training is carried out in a standardized manner for the inner eye and power of sight. Developing visual skills in handball leads to upgrading the

level of the skillful offensive and defensive performance during the match.

This study conforms with results reached by Calder , S. & Noakes (2000) (32) and Mazyn, L. et al (2004) (40) who suggested that visual training contributes to developing the visual capabilities of the two eyes or of one eye and the skillful performance level of the different sports activities studied elsewhere.

Discussion of the results reached by this and other studies concerned with developing the basic skills of handball showed that the use of visual exercises has led to the improvement of good sight, visual acuity, whether static or dynamic, eye-hand coordination, visual tracking, thus leading to the improvement of skillful performance during competition and achieving many aims, especially because the passing and shooting skills need such programs. This was noticeable in the results of the skillful performance level studied here, as the visual training program led to improving the skillful performance of the offensive skills studied in handball and the selected visual skills.

Table 19

Mean, standard deviation, the difference between the two means and the calculated T value of the differences between the experimental group and the control group in the combined tests and their components

Test title	Experimental group (N=18)		control group (N=18)		Difference between the two means	T value and significance level
Combined faint skillful performances	mean -	Standard deviation ±	mean -	Standard deviation ±		
Playmaker position	21.17-	14.29	2.7-	4.48	18.57	**4.961
Right wing and circle	45.43-	19.87	11.77-	6.93	33.66	**6.389
left wing and circle	28.54-	7.07	2.58-	13.84	25.96	**6.684
Right back position	52.25-	21.91	9.62-	8.02	42.63	**7.309
Left back position	49.78-	13.55	18.61-	7.61	31.62	**8.140

** all theses values are significant at the significance level of 0.01

** the tabular T value at the level of 0.01 = 2.71

Table 19 shows a difference between the experimental group and the control group in all results of the measurement of the combined tests and their components at the significant level of 0.01 favoring the experimental group.

A. the center back position (play-maker):

the calculated T value of the differences was 4.961 in the combined feint performances tests in the play-maker position, because performance of the player in this position has a special nature of its own and particular requirements that are different of those required by other positions. He is the driving force for his teammates in the playground. He is the one who decides the direction of the offensive performance during the second wave of the fast break, and the organizer of the tactical performance during the third wave of the fast break. This requires mastering some combined feint skills (such as receiving the ball then doing a combined feint with a left-right-left movement then passing). In this position the player has also to read the playground very well and notices the defense distances so that he can choose the attack moment. He must therefore master some combined offensive feint skills related to breaking through to attack from the front point (such as a combined feint by a left-right-left movement then a feint pass then dribbling and shooting by jumping forwards; a combined feint by a right-to-left movement, swinging the arm then dribbling to break through and shooting by jumping forwards; feint by shooting by jumping high then dribbling to break through and shoot by jumping forwards).

Attacking from the back point requires the mastering of some combined feint skills (such as a simple feint with the body then receiving then a right-to-left combined feint and shooting by jumping high; feint by shooting under the trunk level then shooting by jumping high). Werner, V. et. al. (1997) and Taborsky (1999) suggest that the play maker must be intelligent and able to read the playground during the tactical offensive performance. He must therefore possess several combined feint skills, especially feint shooting skills so that he can do a parallel rush and fixing to create an increase in the number of players for his teammates and pass when the opportunity comes to attack and shoot (18:216)(46:1).

The significant improvement in the results of the combined feint performances in the playmaker position favoring the experimental group is attributed by the author to the players' acquisition of several feint tactical combinations from the program. Consequently, there was an improvement in the players' ability to coordinate movements which are different in form and direction, and performing them in a model of one single motor

performance quickly, accurately and smoothly, thus acquiring the ability to adapt to more skillful requirements and physical burdens. This conforms with results reached by Feldman (1997) (36: 2-3).

B. The right wing and circle positions:

The calculated T value of the differences was 6.398 in testing the combined feint performances for the right wing and circle positions, including the following combined feint performances during a fast break: feint by dribbling then rotating using the other hand in dribbling and doing a left-to-right combined feint movement, rotating the arm and passing; doing a left-to-right combined feint movement and jumping with a sharp pass. In this respect, the author agrees with Taborsky (1999) who suggested that the wing player must possess a speedy re-action to start and a quick repetition of the movement during the starting movement, making an individual performance without the ball: starting, and running to reach a place better than that of defenders during the first wave of the fast break. He must therefore master the combined feint skills to break through and overcome defenders in situations where there is a defense confrontation (103 : 1). The combined feint performances here also include performances during attacking from the front area: a feint without the ball then a right-left-right feint movement and shooting by jumping forwards; receiving the ball then feinting by rotating against the shooting arm then rotating and shooting in the direction of the shooting arm; receiving the ball then feinting by rotating in the direction of the shooting arm then rotating and shooting against the direction of the shooting arm; a simple feint without the ball, then receiving then a left-right combined feint, rotating the arm to overcome defender then shooting by jumping forwards. In this respect, Khaled Hammouda and Yasser Dabbour (1995) said "the wing must use his body in an agile manner to avoid the defender and pass to reach a gap where it is easy to receive the ball. He must therefore master combined feint movements which will help him overcome and go through the rival defense field" (21 : 286).

This position also includes the following feint movements during an attack from the back area: receiving the ball and doing a combined feint by shooting from running then going through and shooting by jumping forwards. According to the author, playground-related situations occur during the tactical offensive performance in which the wing or circle player finds himself in a defense confrontation from the back area, and so he must master the combined feint movements, so that he can change positions of his body to shoot and score a goal. This is in conformation with statements by Khaled Hammouda and Yasser Dabbour (1995) (21 : 287).

The significant improvement in the results of the combined feint performances in the right wing and circle positions favoring the experimental group is attributed by the author to what Feldman (1997) and Garcia (2000) said: the training program made the players adapt to time pressure thus achieving minimum time and ideal maximum speed (36 : 3) (37 : 2).

C. The left wing and circle positions:

The calculated T value of the differences was 3.684 in testing the combined feint performances for the left wing and circle positions, including the following combined feint performances during a fast break: zigzag dribbling and a left-to-right combined feint with the ball then jumping and passing. The author here agrees with Taborsky (1999) that "the wing is the first line in attack and must therefore possess a great deal of speed of movement whether with or without the ball. He must also possess several feint skills so that he can overcome defenders during the fast break (45:1).

The position also involves the following combined feint performances during attacks from the front area: a simple feint without the ball then a left-right-left combined feint with the ball, while breaking through and shooting by jumping forwards; receiving and feint by rotating against the shooting arm then rotating and shooting in the direction of the shooting arm; feinting by rotating in the direction of the shooting arm then rotating and shooting against the direction of the shooting arm; a simple feint without the ball, then a right-left combined feint with the ball, rotating the arm to break through and shoot by jumping forwards. In this respect, Taborsky (1999) says "the wing player must have a high ability of receiving the ball in the middle of defenders and under pressure and resistance from defenders, and getting rid of and overcoming them by rotating while doing combined feint skillful performances, then shooting by throwing or flight, identifying shooting angles". (45:3).

The position also included the following combined feint performances during attacks from the back area: receiving the ball then a combined feint by shooting from running at the knee level then shooting by jumping high. In this respect, Taborsky (1999) agrees with Khaled Hammouda and Yasser Dabbour (1995) that "the wing must possess an offensive ability to open a gap and break through defenders in the playground-related situation in which he might be during attack from the back area. This requires the mastering of combined feint skills that will help him break through the defense wall (45:31) (21:286).

The significant improvement in the results of the combined feint performances in the left wing and circle positions favoring the experimental group is attributed by

the author to the training program which had a positive effect on improving speedy, accurate and coordinated performance, as a result of possessing different types of combined motor performances similar to the ever changing situations of the match. This conforms with results reached by Amrallah el Basaty (1994) and Feldman (1997), Mohamed Keshk & Amrallah el Basaty (2002), (6:9), (36: 3), (24:265).

D. the right back position:

The calculated T value of the differences was 7.309 in testing the combined feint performances for the right back position, including the following combined feint performances during a fast break: feint by passing then dribbling and a right-left combined feint then a sharp pass; feint by passing then rotating and a right-left-right combined feint then passing by jumping and leaning.

In the author's opinion, the actual playground-related situation of the back as a result of the retreat of the defenders of the rival team in the second wave makes it necessary for him to master the combined feint skills of passing because of the equal number of the attackers and the defenders and the participation of a large number of players, to help him break through the defenses of the rival team or taking an influential position during the third wave that would help the player possessing the ball threaten the goal and score a goal. This conforms with the opinion of Taborsky (1999) (102:302).

The position also included combined feint performances during attack from the front area, such as a simple feint without the ball then receiving the ball and feint passing then passing and dribbling, followed by a right-left-right combined feint with a break through and shooting by jumping forwards; a combined feint rotating the arm and overcoming the defender then dribbling and feint passing, break through to shoot by jumping forwards. In this respect, the author agrees with Werner, V et al. (1997) that "during the offensive performance of the team there occur playground-related situations where the back is in a defensive confrontation with a defender of the rival team (one to one). He must therefore, use his combined feint skills in order to succeed in overcoming the defender and break through the front area (40: 213 – 218). The position also includes the following combined feint performances during the attack from the back area: a simple feint without the ball then receiving followed by a right-left-right combined feint, then a feint by passing and shooting by jumping high; a feint by passing then dribbling followed by a left-right combined feint and shooting by jumping high. In this respect, Taborsky (1999) said, "the back finds the easy solution to the competitive situation in which he finds himself with the defender by using effective feint movements to succeed in shooting from outside" (45: 1-2). This is confirmed by Khaled Hammouda and Yasser Dabbour (1995) (21: 273).

The significant improvement in the results of the combined feint performances in the right back position is attributed by the author to the opinion expressed by Werner, V et al. (1997) and Adel Abdel Basir (1999): "the training program the acquisition by players of the coordination factor, and consequently the improvement of the ability to perform a motor connectivity by merging several movements in one framework of speed, smoothness and good performance. Thus, the players were adapted to the varying pressures by reducing the total time of performance and increasing the accuracy of passing and shooting in playground-related situations". (18:216) (16:92).

E. The left back position:

The calculated T value of the differences was 8.140 in testing the combined motor performances for the left back position, including the following combined feint performances during a fast break: running without the ball then receiving the ball and a feint passing and a left-right-left combined feint and passing; feint by passing, then a right-left combined feint then passing, picking the ball and a feint by rotating the arm, overcoming the defender, then a feint passing then passing. In this respect, Khaled Hammouda and Yasser Dabbour (1995) stated that "the back must control the speed of his movements, suddenly changing the direction of his running forwards and backwards, and to the right and to the left according to the playground-related situation present during the second wave of the fast break. He must also master the combined feint skills so that he can use the correct movement suitable to the offense situation which will enable him to easily overcome the defender". (21: 208-209).

The position also included the following combined feint performances during the attack from the front area: a simple feint without the ball then receiving the ball with a right-left combined feint, rotating the arm to overcome the defender then breaking through and shooting by jumping forwards; a feint by shooting from running at the knee level then a feint by rotating the arm and overcoming the defender and breaking through to shoot by jumping forwards. In this respect, Khaled Hammouda and Yasser Dabbour (1995) and Taborsky (1999) said, "the only way for a back to overcome the defender during the individual tactical performance is using the types of combined feint and skills possessed by the player to freely overcome the defense wall and break through defense distances (21: 157) (45:403). The position included the following combined feint performances during the attack from the

back area; a simple feint without the ball, then receiving the ball, doing a left-right-left combined feint and shooting by jumping high; receiving the ball then a feint by passing from running at the trunk level then doing a left-right-left combined feint and shooting by jumping high. Here, Khaled Hammouda and Yasser Dabbour (1995) suggest, "the back must be effective in the tactical movements of the team according to the requirements of the playground-related situation, by perfecting several combined feint movements through which he can overcome the defense situation in which he finds himself and succeed in shooting from outside and score a goal". (21: 273)

The significant improvement in the results of the combined feint performances in the left back position favoring the experimental group is attributed by the author to the training program which led to the players being adapted to the combined pressure through the acquisition of several tactical structures and combined movements performed in simple circumstances then in difficult situations close competition. This conforms with results reached by Feldman (1997) (36:2) and Rackner (1998) (42:3).

The high differences in the improvement percentage favoring the experimental group are attribute by the author to the direct effect of the proposed training program which helped players acquire the general coordination abilities by acquiring the simple movements and performing them in difficult circumstances, and the coordination ability required by handball through the acquisition by the players of several feint tactical structures, and consequently the improvement of the players' ability to coordinate movements that are different in form and direction and performing them in one model of the motor performance speedily, accurately and smoothly in difficult circumstances and situations. This conforms with the opinion expressed by Feldman (1997), Mofty Ibrahim (1996), Wrener V. et al. (1997) and Adel Abdel Basir (1999) who stated that "the coordination ability means the ability to merge several movements in one framework that is smooth, well-performed in a single motor model. The need for motor coordination increases, the more complicated the movements are. (36: 1-2), (27: 134 – 136), (18: 134),(19: 4).

The improvement in the speed of the combined feint performances, i.e., the decrease in the total time of performance and the increase in the accuracy of passing and shooting, is attributed by the author to using a training approach based on the development of the combined feint skillful performances in conditions similar to those of performing in the match, so that the players can adapt to motor pressures through enduring the large number of skillful requirements and physical burdens. This conforms with results reached by Garcia (2000), Shaaban Ibrahim (2002), Mohamed Keshk & Amrallah el Basaty (2002) who said "training to the skillful performances in playground-related conditions and situations leads to establishing such performances and doing them well during competition". (37: 5-6), (14:359), (24: 197).

On the other hand, the improvement is attributed to the fact that performing combined tests was based on recording additional time as a penalty for errors made in doing the skillful performances. This led to an increase in the total time of performance in the pre-measurement of the two groups which made many errors. Exposure to the program led to an improvement in performance by the experimental group, on one hand, and making fewer technical errors (which incurred an increase in time) and consequently the total time of performance was reduced in the post-measurement of the experimental group, thus bringing the improvement percentage to 41%.

6/0 – Conclusions and recommendations

6/1 - Conclusions:

In the light of the current study, the author made the following conclusions:

6/1/1 – Conclusions on the combined tests:

This study developed five tests to measure speed of the combined offensive skillful performances in the different playing positions (playmaker – right wing with the circle – left wing with the circle – right back – left back) which can be used as an objective tool in selecting, classifying and guiding the best junior players, in addition to evaluating the performance of players and their level of improvement during the sport season.

6/1/2 – Conclusions on the proposed training program

The speed of combined offensive skillful performances was developed in the two groups (experimental – control).

There are statistically significant differences in the performance level of the combined offensive skills both in time of performance and in accuracy between the experimental and control groups favoring the experimental group. This is attributed to the effect of the proposed training program, the following may be concluded:

- Achieving the minimum time, and maximum idealism and speed by training to the actual playing situations through the development of the combined offensive skillful tools within positional defense formations.

- The improvement of the speed of combined offensive skillful performances in players of the experimental group, compared to their counterparts in the control group, i.e., reduction of the actual time of performance and the increase in the accuracy of passing and shooting. This is attributed to "structuring the training units of the proposed program using the correct dynamics.
- The increase in the ability of players in the experimental group, compared to their counterparts in the control group.
- The ability to merge several movements in one framework which is speedy, accurate and smooth is attributed to the many different feint technical structures contained in the proposed program. This led to the acquisition by the players of the coordination ability and consequently a higher ability of motor connectivity.

6/1/3 – conclusions on the combined offensive feint performances in the players' lines:

- The type of combined feint performances most used and most effective for the back line players during the fast break is feint by passing then combined feint with the ball then passing.
- The type of combined feint performances most used and most effective for the back line players during the attack from the front area is :
- A combined feint with the ball then feint by passing or dribbling then shooting by jumping forwards
- A feint by passing then a combined feint with the ball then shooting by jumping forwards
- A feint by shooting then a combined feint with the ball then shooting by jumping forwards
- The type of combined feint performances most used and most effective for the back line players during the attack from the back area is
- feint by shooting, then combined feint with the ball then shooting by jumping high.
- Simple feint without the ball then combined feint with the ball then shooting by jumping high.
- Feint by passing then combined feint with the ball then shooting by jumping high.
- The type of combined feint performances most used and most effective for the front line players during the fast break is
- feint by dribbling then combined feint with the ball then passing or shooting.
- The type of combined feint performances most used and most effective for the front line players during the attack from the front area is
- Simple feint without the ball then combined feint with the ball then shooting by jumping forwards
- Feint by rotating in the direction of the shooting arm the rotating and shooting against the direction of the shooting arm
- The type of combined feint performances most used and most effective for the front line players during the attack from the back area is
- Simple feint without the ball then feint by shooting then shooting by jumping high.

6/1/4 – Conclusions on visual capabilities

In the light of the research aims and hypotheses, and based on the research community, the statistical treatments and the results reached, the following conclusions were made:

1- the visual training program applied to the experimental group led to the development of visual capabilities (eye-hand coordination – static visual acuity – dynamic visual acuity – peripheral vision – visual tracking) because there are statistically significant differences between the experimental group and the control group in the post-measurement, favoring the experimental group.

2- the visual training program applied to the experimental group led to the development of combined offensive skillful performances (passing – receiving – dribbling – feint – shooting by jumping high) because there are statistically significant differences between the experimental group and the control group in the post-measurement, favoring the experimental group.

3- the visual training program applied to the experimental showed improvement percentages both in visual variables and combined offensive skills of junior handball players in the experimental group.

4- training using visual exercises has a positive effect on doing the combined offensive performances studied.

5- visual capabilities are important to achieve the requirements of a good offensive technical performance, and as they differ from one player to another, they must be treated and trained individually.

6/2 – Recommendations

In the light of the research sample and the experiment's time and geographical scopes, the following recommendations were made:

- Using the tests designed as a tool of evaluating and correcting the 13-17 year-old handball juniors.
- Applying the planned training programs to different age groups of juniors focusing on the dynamism of developing elements during the different age spans according to the type of competition and the size, form and distribution of matches during competition and the training condition of the team when applying such training programs.
- Conducting similar studies on the effect of visual capabilities on developing the combined defensive skills in handball and in other sport games.

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