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The Impact of a Training Program of Complex Skills and Vision Drills on Specific Visual Abitities and Quick and Accurate Motor Performance in Football Juniors

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Abstract: The aim of the study was to design a training program of complex skills and vision drills for improving velocity and accuracy of motor performance for complex skills with ball, also to identify the effect of vision training program on developing skilled performance and the improving ratios in footplayer juniors.The the method applied was an experimental single-group design, in pre / between / post measurements.A total of 30 football players,16years old, a team, recorded in TheEgyptian Football Association., intentionally selected from, Kafr El-Sheikh club, Kafr El-Sheikh governorate, participated in the study. A pilot study was administered to 20 football juniors, 15 years old, from Kafr El-Sheikh club, Kafr El-Sheikh governorate, as added subjects, not included in the main research population, to ensure quality of Procedure from 8-6-2008 to 11-6-2008, to determine the heart pulses pre performance as an indicator for recovery, after 90-120 seconds rest, with 75-85 pulse average per minute. as well as to find out the correct distance for the player to execute different motor combinations. Additonly to ensure the scientific appropriateness of test reliability and validity.The study was conducted over 8 weeks, for 3 training units per week from 24-6-2008 to 2-9-2008. The pre measurement was conducted from 15-6-2008 to 22-6-2008 and post measurement was conducted from 4-9-2008 to 10-9-2008, The suggested training program and vision drills showed a positive effect on velocity and accuracy of motor performance of complex skills with ball, developing visual ability in football juniors. Results showed statistical significant differences between pre-post measures, on quick motor performance of complex skills with ball, as well as improving ratios, for the post measure.Results also refered to statistically significant differences between pre-post measures on visual abilities, development of skilled performance and improving ratios for the post measure. To achieve high levels in sports is not depending on chance or a result of a random manner, but it is an outcome of updated scientific knowledge associated with sports advanced training. Thus, developed countries are more interested in scientific research in the field of athletic training for all players at all levels; juniors and expert players.

Key words: Complex skill · Vision training · Visual abitities · Quick motor performance

INTRODUCTION

Today, sports have significantly developed, associated with health sciences and biomechanics, physiology, anatomy, engineering and etc., resulted in new approaches to the progress of performance and growth of new applied researches on the benefits of organized sports activity. Sciences related to sports, especially sports engineering and medicine tend to have a great positive influence on training methods associated with performance enhancement physically and technically. The aim of modern sport training strategy, is to achieve a perfect physical state of athlete in perfect timing, acceptable to competitive seasons in professional sports as long as possible [1].

Football is a rich sport of various basic skills using head, thigh, chest, legs and hands. Skillful hand is indispensable for proficient goalkeeper in throwing. yet, mastery of the basic skills needs newer and more effective methods for developing the skilled performance [2]. A player who has new and diverse skills as well as physical traits, will benefit greatly from them, because they can be best investment regarding time, energy, or effort in his distinguished career. He will be able to consistently

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compete at the highest level throughout the season, in different motor situations and to acquire new motor skills easily [3,4]. Many leading experts in the field believe skilled performance to be developed and motor sports skills to be established, to gain best achievements from an international perspective. This only comes through quality not quantity of drills, involving players, physically and psychologically, to remain focused and concentrating and should have higher quality technical skills [5]. Practicing the basic skills in an integrated way within organized combinations will enable the forward to surpass the defender and to score easily as quickly as possible.

The effectiveness of complex skills is to improve his levels of performance, increase his tactical information, to adapt his skills to continual changes in practice conditions, to perfect motor skilled performance and to break a defensive line [1]. The complex skilled performance of receiving and dribbling then scoring, is a motor combination of three complex skills; each one has its own specific objective.Each skilled performance is a sequence of three phases: preliminary-basic-final, to be integrated as a new particular arrangement [6-9]. Clarity of intra-combined phase is diminished while the distinguished handball player is integrating his complex skill performances into his framework of complex skilled performance with compatibility and less effort. In competitive matches with a variety of actions, the player has to utilize a sequence of many integrated and complex skills according to the nature of play. Thus, coach must assure that his players are well prepared for difficult situations and that they became completely proficient or skilled in passing, receiving and elusiveness [10]. Complex skilled performance is sequentially, simultaneously, or elusive. In sequential one, all forms of skilled performance are integrated simultaneously showing no difference in succession. While complex skilled performance has attached distinctive phases to execute new skilled performance [11]. Due to varied playing positions, the player has to use many forms of complex skilled performances, therefore, drills must be relevant to skillful competition [6, 7, 12].

Visual sensation plays a major role in various motor activities, along with other senses, in perceiving motor performance accordant with motor activity positions. Generally, attitudinal drills as well as motor leaning need sight, hearing senses, more than any other sense [13]. Additionally, visual effects can be studied within two key determinants: viewing the interior and exterior effects of the eye: The first refers to visual field efficiency for each eye as visual acuity and pertinent Eye Diseases and Conditions: Eye pressure, Myopia (shortsightedness), Hyperopia (farsightedness),that need medical treatments. While the other signify improving visual acuity and visual perception in general and sports field in particular by suitable drills needed for specific accurate technical performance in different sport positions[14]. Optometry (meaning measurement of sight) is the science of measuring visual acuity to determinerefractive errors of the eyes and prescribing corrective lenses appropriate to the nature of sports activity [15].visual sensation is the perceptual experience of seeing, as a sense organ, playing a significant role in human life, proposed that our knowledge of the outside world depends on our modes of perception and sensory system with specialized cells that have receptors for specific optical stimuli [16].There are numerous studies on sight, being significant to man, ancient philosophers believed visual faculty is the dominant sense among human beings.Vision training in sports field is a new concept, gaining ground recently, as a program proposed a positive impact on sports training [17]. In addition, it is difficult to follow up visually specific skilled performance in many sports activities. i.e. it is hard for tennis player to follow the ball route for 0.05-0.2 seconds to produce an effective shot [18].

As mentioned above, the impact of complex skills on improving the performance level of players is observable, however, the researcher as a university teacher of football, trainer and ex-football player, has noticed through follow up of matches, a falloff in quality of complex skilled performance among players. This may be due to a serious lack of specific drills in training programs, contribute to the progress and speed of complex skills among juniors to perform effectively in matches of various competitive situations. Also, the football players lack concentration and good visual perception related to their positions in matches, having a negative effect upon their skills level and tactical performance indirectly, accomplished nothing, simply because of the problem involved, needs further study.

Regardless of various football-related researches, including physical, skillful, tactical, physiological and psychological aspects, giving little or no attention to visual abilities in training programs, a major factor can contribute significantly to improve speed and accuracy of complex skills. Therefore, researcher was motivated to conduct this study on football based on previous research literature on developing visual abilities and quality and accuracy of skilled performance using vision training. Also, confirming the relevant findings of these studies through linking vision training and complex training together.

MATERIALS AND METHODS

The method applied was an experimental single-group design, in pre / between / post measurements.

A total of 30 qualified football juniors, under 16years, intentionally selected, from Kafr El-Sheikh club, Kafr El-Sheikh governorate, participated in the study.

To ensure the normal distribution curve of sample, the researcher conducted sampling homogeneity for some variables namely: growth rates, training age, is shown in Table 1.

To estimate test-retest reliability the researcher administered the same test to the same pilot sample of 20 football juniors, on two different time intervals (time allowed between measures is 4 days), as first test was conducted on 8/ 6 / 2008, the second on 11/ 6/ 2008, in the same way from the same content domain. Correlation coefficient was estimated for complex skill test (velocity and accuracy of performance and visual abilities as shown in Tables 2-4.

Tables 2-4 demonstrated the significance of correlation coefficient at $p = 0.05$ for all complex skills: performance quickness, performance accuracy and visual abilities, as the results indicate higher values ranged between 0.701 to 0.995, making clear the high test reliability.

To ensure test validity, Discriminant validitywas applied through significant differences between 'upper quartile' and 'lower quartile' groups. The researcher sorted subjects of pilot study (20 juniors) descendingly in the second test-retest reliability, obtaining significant differences between the two groups on performance quickness, performance accuracy and visual abilities. As shown in Tables 5-7.

Tables 5-7 show significant differences between upper quartile and lower quartile groups at $p = 0.05$, for upper quartile group on all complex skillful tests: quick motor performance, accurate motor performance and visual abilities, providing evidence for test validity on all variables.

Measuring Motor Performance Quickness with Ball in Motor Skills: Being based on literature review on football, in Arabic and English [7, 12, 19-21], the researcher designed 6 motor combinations for complex skills with ball, in an effort to develop quick and accurate

Table 1: Descriptive statistics of growth variables and training age of subjects (height, chronological age and weight)

variables	Measure unit	mean	Standard deviation	median	coefficient of skewness
Height	m	1.76	0.103	1.81	-1.459
Chronological age	year	16.44	0.882	21	1.512
weight	kg	61.56	6.876	62	-0.169
Training age	year	4.00	3.12	4.78	-0.58

Test-retest reliability:

Table 2: Descriptive statistics for test-retest reliability of quick performance (p = significance / significant; R= correlation; SD = standard deviation; NS= non significant)

	first application			Second application			correlation coefficient	
Skilled performance	mean	±	SD	mean	±	SD	r	P
Control then passing	5.220	±	0.404	5.039	±	0.268	0.995	0.00
Control then running with ball then passing	5.975	±	0.378	6.063	±	0.382	0.759	0.00
Control then evading then passing	4.951	±	0.373	5.044	±	0.460	0.880	0.00
Control then shooting	3.682	±	0.152	3.790	±	0.256	0.964	0.00
Control then running with ball then shooting	4.327	±	0.336	4.732	±	0.369	0.937	0.00
Control then evading then shooting	4.865	±	0.362	4.643	±	0.467	0.701	0.00

Table 3: Descriptive statistics for test-retest reliability of performance accuracy (p = significance / significant; r= correlation; SD = standard deviation; NS= non significant)

	first application			Second application			correlation coefficient	
Skilled performance	mean	±	SD	mean	±	SD	r	P
Control then passing	1.359	±	0.163	1.357	±	0.174	0.891	0.00
Control then running with ball then passing	1.725	±	0.145	1.838	±	0.165	0.812	0.00
Control then evading then passing	1.999	±	0.138	2.057	±	0.222	0.744	0.00
Control then shooting	2.015	±	0.170	2.102	±	0.205	0.849	0.00
Control then running with ball then shooting	2.248	±	0.383	2.244	±	0.266	0.944	0.00
Control then evading then shooting	2.196	±	0.319	2.528	±	0.252	0.960	0.00

Table 4: Descriptive statistics for test-retest reliability of visual abilities variables

	first application			Second application			correlation coefficient	
visual abilities	mean	±	SD	mean	±	SD	r	P
eye-hand coordination	17.656	±	1.637	18.376	±	2.293	0.857	0.00
static visual acuity	21.015	±	2.284	20.018	±	1.389	0.971	0.00
dynamic visual acuity	2.494	±	0.518	2.868	±	1.009	0.736	0.00
visual perceptual	7.015	±	1.760	6.269	±	1.049	0.789	0.00
visual follow up and dominant eye	1.971	±	0.714	2.205	±	0.483	0.755	0.00
Visual quick reaction	21.216	±	1.273	21.522	±	0.877	0.757	0.00
visual perceptual at a distance of 10 m	5.426	±	0.906	5.771	±	1.343	0.876	0.00
at a distance of 20 m	8.161	±	2.589	9.112	±	1.457	0.830	0.00
at a distance of 30 m	9.799	±	2.034	9.907	±	2.522	0.746	0.00
Vertical up	67.852	±	6.328	67.695	±	8.808	0.867	0.00
Down Vertical	58.274	±	8.054	60.285	±	10.100	0.586	0.00
Horizontal right	78.402	±	5.469	83.971	±	7.881	0.891	0.00
Visual Efficiency of dominant eye	75.620	±	7.539	76.196	±	4.165	0.844	0.00

Table 5: Descriptive statistics for test validity in variables of performance quickness (n1= n2 = 5)

	lower quartile			upper quartile			t test	
Skillful tests	mean	±	SD	mean	±	SD	t	P
Control then passing	4.528	±	0.169	5.564	±	0.085	12.268	0.00
Control then running with ball then passing	5.503	±	0.172	6.504	±	0.113	12.395	0.00
Control then evading then passing	4.426	±	0.140	5.642	±	0.174	11.436	0.00
Control then shooting	3.445	±	0.118	4.012	±	0.045	10.895	0.00
Control then running with ball then shooting	3.993	±	0.150	5.206	±	0.144	11.274	0.00
Control then evading then shooting	4.111	±	0.124	5.479	±	0.134	8.154	0.00

Table 6: Descriptive statistics for test validity in variables of performance accuracy (n1= n2 = 5)

	lower quartile			upper quartile			t test	
Skillful tests	mean	±	SD	mean	±	SD	t	P
Control then passing	1.116	±	0.094	1.652	±	0.022	12.163	0.00
Control then running with ball then passing	1.540	±	0.070	1.996	±	0.057	6.965	0.00
Control then evading then passing	1.784	±	0.065	2.292	±	0.150	12.821	0.00
Control then shooting	1.768	±	0.052	2.342	±	0.047	10.029	0.00
Control then running with ball then shooting	1.846	±	0.049	2.712	±	0.225	18.354	0.00
Control then evading then shooting	1.874	±	0.230	2.792	±	0.160	14.706	0.00

Table 7: Descriptive statistics for test validity in variables of visual abilities (n1=n2=5)

	lower quartile			upper quartile			t test	
Visual abilities	mean	±	SD	mean	±	SD	t	P
eye-hand coordination	15.264	±	0.949	21.096	±	0.633	13.081	0.00
static visual acuity	18.212	±	0.399	23.628	±	1.431	8.415	0.00
dynamic visual acuity	1.508	±	0.409	4.004	±	0.150	11.847	0.00
visual perceptual	4.474	±	0.441	9.120	±	0.552	16.759	0.00
visual follow up and dominant eye	1.078	±	0.249	3.054	±	0.278	7.317	0.00
Visual quick reaction	19.612	±	0.315	22.696	±	0.494	11.780	0.00
at a distance of 10 m	3.968	±	0.618	7.772	±	0.417	11.410	0.00
at a distance of 20 m	4.694	±	0.340	11.002	±	0.862	15.229	0.00
at a distance of 30 m	6.986	±	0.283	13.506	±	0.624	21.263	0.00
Vertical up	56.262	±	2.344	78.574	±	2.247	15.365	0.00
Vertical down	45.356	±	3.400	68.462	±	3.269	10.955	0.00
Horizontal right	73.960	±	2.672	93.126	±	3.994	8.917	0.00
Visual Efficiency of dominant eye	2.820	±	0.836	6.130	±	0.329	8.234	0.00

motor performance, then consulting physical education experts, they considered them appropriate for study, These different six motor combinations for complex skills with ball are designed as a form of complex tests, using half distance of football field, based on pilot study to define correct distance for implementing them. The different six motor combinations are as follows:

- Control then passing
- Control then running with ball then passing
- Control then evasion then passing
- Control then Shooting
- Control then running with ball then Shooting
- Control then evasion then Shooting

Motor Combination Program:

- Control the ball while10 m running, then 10 m zig zag run among 8 hurdles, 15 m start, then shooting.
- 15 m zig zag run among 10 hurdles, rotating with ball around static cone, then control the ball while10 m running, then passing toward static blocking wall, 10 m sprint to receive the ball.
- Control the ball while15 m sprint, then passing, then receiving block wall at 5m distance, then evasion at 5m distance for two hurdles, then 10m start, then shooting.
- receiving along with evasion, then passing along with receiving from block wall at 10 m distance, then control the ball while15 m running, then passing along with receiving from block wall at 10 m distance, then 5m start, then shooting.
- receiving along with evasion, then passing and receiving from block wall at 10 m distance, then control the ball while10 m running, then5 m passing between two hurdles, then 10m start, then shooting.
- 15 m zig zag run among 8 hurdles, then control the ball while10 m running, then passing along with evasive receiving at static hurdle, then shooting at 10 m distance.
- 10 m start, then10 m zig zag run among 6 hurdles, then passing along with receiving from block wall at 10 m distance, then5 m start, then shooting.
- receiving along with evasion, then passing along with receiving from block wall at 15 m distance, then control while10 m sprint with the ball, then 4m passing between two hurdles, then 6m running with ball, then shooting.
- 15 m zig zag run among 10 hurdles, then10 m start with ball, then passing to block wall, then evasive receiving at 3m hurdle, control the ball while7 m running, then shooting.

Measuring Visual Abilities in Subjects:

- Eye-hand coordination, visual perceptual, visual quick reaction, visual depth perception and visual field perception of dominant eye tests.
- Static visual acuity, dynamic visual acuity, visual follow up of dominant eye tests.
- Visual Efficiency of dominant eye by marks.

Utilized Equipment and Tools:

- Football field
- Balls
- Blocking wall for passing and stools
- tape measure
- Plastic cones for zigzag running.
- Lime to mark lines
- Visual quick reaction apparatus.

Designing the Suggested Program

Objectives: The objectives of this program are to:

- Identify the impact of using motor combination drills regarding complex skills, on performance quickness among football juniors.
- Setting goals.
- Ensure content suitability of the main sample.
- Determine the content of training modules and training schedule
- Set 3 training modules per week.
- Take into account individual differences among the subjects, through measuring their maximum capacity.
- Make sure that rest between exercises is sufficient for recovery.
- Make sure that motor combinations with ball are varied requiring a high level of energy consumption.
- Determine the optimal correlation for training load components among juniors.
- Ensure a repeated high level of speed among training modules, needed for physical efficiency and appropriate recovery.
- Give the junior clear idea about vision training.
- Allow player to discover facts by himself.
- Be attentive.
- Comprehend the skill easily.

Pilot Study: A pilot study was administered to 20 football juniors, 15 years old, from Kafr El-Sheikh club, Kafr El-Sheikh governorate, as added subjects, not included in the main research population, to ensure quality of Procedure from 8/ 6/ 2008 to 11/ 6/2008, to determine the heart pulses pre performance as an indicator for recovery, after 90-120 second rest, with 75-85 pulse average per minute, as well as to find out the correct distance for the player to execute different motor combinations. Additionally to ensure the scientific appropriateness for test reliability and validity.

Program Schedule: Based on survey and review of previous studies, the duration to implement the program was determined by 8 weeks, three training modules per week, for 100-120 min.

Training Module Sessions: Training module was divided into 3 workout sessions:

- Warm-up and ready positionsession: for 15-20 min., including drills for activating body organs physically and physiologically.
- Main session: for 70-80 min., including a variety of drills of progressing difficulty, to develop quickness and velocity of skilled performance, as well as visual training.
- Final session: for 15 to 20 min., including various drills and relaxation, to enable maximum rest and recovery for players.

Administering the Program: The study was conducted over 8 weeks, for 3 training modules per week, each module for100-120 minutes, from 24-6-2008 to 2-9-2008. The pre measurement was conducted from 15-6-2008 to 22-6-2008 and post measurement was conducted from 4-9-2008 to 10-9-2008.

- The pre measurement was conducted from 15-6-2008 to 22-6-2008.
- The between pre measurement was conducted from 15/7/2008 to 22/ 7 / 2008.
- Post measurement was conducted from 4-9-2008 to 10-9-2008.
- All measures were administered at Kafr El-Sheikh club.
- Visual acute and Visual Efficiency tests were conducted at a specialized centre for Ophthalmology.
- The researcher utilized statistical treatment that was appropriate for nature and purpose of research through the statistical program (SPSS) including: Mean, median, Standard deviation, coefficient of skewness, correlation coefficient, improvement ratio test %, t test, ANOVA, linear regression, the acceptable significance p= 0.5.

RESULTS AND DISCUSSION

Table 8 shows mean, standard deviation and improving ratios of quick performance variable on pre, follow up and post measures for complex skills under study, as well as improving ratios between pre and followup measures and between pre and post measures, between followup and post measures.

Table 9 showed significance where p-0.05 for quick performance and complex skills tests variables that evidenced in table 10.

Table 10 showed statistical significant difference at 0.05 on quick performance variable in complex skilled tests between: Pre measure versus post measure. Pre measure versus follow up measure and follow up measure versus post measure, in favor of post measure.

Table 11 demonstrated Mean, Standard deviation and improving ratios for performance accuracy variable on pre, follow up and post measures for complex skills under study. as well as improving ratios between pre and followup measures and between pre and post measures, between followup and post measures.

Table 12 showed statistical significant differences at 0.05 on performance accuracy variable in complex skilled tests. this will be evidenced in table 13 by LSD test.

Table 13 showed statistical significant differences at 0.05 on performance accuracy variable in complex skilled tests between: pre measure versus post measure. Pre measure versus follow up measure and follow up measure versus post measure, in favor of post measure.

Table 14 shows Mean, Standard deviation and improving ratios for visual abilities variables on pre, follow up and post measures for complex skills under study, as well as improving ratios between pre and followup measures and between pre and post measures, between followup and post measures.

Table 15 showed statistical significant differences at 0.05 on visual abilities variables. This will be evidenced in table 16 by LSD test.

Table 8: Descriptive statistics for mean, standard deviation and improving ratios of quick performance in complex skills

	Pre measure			Follow up measure			Post measure			Improving ratios		
quick performance	m	±	SD	m	±	SD	m	±	SD	Pre and follow up	Pre and post	follow up and post
Control then passing	5.077	±	0.361	4.216	±	0.213	3.07 1	±	0.179	16.953	39.520	27.173
Control then running with ball then passing	6.016	±	0.329	4.934	±	0.330	3.740	±	0.205	17.998	37.831	24.186
Control then evading then passing	5.052	±	0.407	4.359	±	0.306	3.384	±	0.239	13.715	33.019	22.373
Control then shooting	3.792	±	0.200	3.164	±	0.348	2.197	±	0.120	16.557	42.055	30.558
Control then running with ball then shooting	4.584	±	0.407	4.088	±	0.476	2.932	±	0.457	10.821	36.036	28.275
Control then evading then shooting	4.837	±	0.453	4.362	±	0.377	3.051	±	0.238	9.808	36.915	30.055

Table 9: Descriptive statistics for differences among pre, follow up and post measures for quick performance variable by ANOVA (p = significance / significant; R= correlation; SD = standard deviation; NS= non significant)

variables	disparity source	free degrees	square total	square mean	f	P
Control then passing	between cases	29	2.003	0.069		
	between measures	2	60.798	30.399	439.210	<0.001
	error	58	4.014	0.069		
	total	89	66.815			
Control then running with ball then passing	between cases	29	2.691	0.093		
	between measures	2	77.768	38.884	467.445	<0.001
	error	58	4.825	0.083		
	total	89	85.284			
Control then evading then passing	between cases	29	3.189	0.110		
	between measures	2	42.140	21.070	204.488	<0.001
	error	58	5.976	0.103		
	total	89	51.305			
Control then shooting	between cases	29	1.456	0.050		
	between measures	2	38.716	19.358	309.583	<0.001
	error	58	3.627	0.063		
	total	89	43.799			
Control then running with ball then shooting	between cases	29	6.270	0.216		
	between measures	2	43.111	21.555	112.056	<0.001
	error	58	11.157	0.192		
	total	89	60.538			
Control then evading then shooting	between cases	29	3.090	0.107		
	between measures	2	51.321	25.661	172.284	<0.001
	error	58	8.639	0.149		
	total	89	63.050			

Table 10: Descriptive statistics for LSD differences between dual differences in measures of quick performance variable

Skilled tests	Comparisons	Mean difference	value LSD	P
Control then passing	Pre measure versus post measure	2.007	0.136	<0.001
	Pre measure versus follow up measure	0.861	0.136	<0.001
	follow up measure versus post measure	1.146	0.136	<0.001
Control then running with ball then passing	Pre measure versus post measure	2.276	0.149	<0.001
	Pre measure versus follow up measure	1.083	0.149	<0.001
	follow up measure versus post measure	1.193	0.149	<0.001
Control then evading then passing	Pre measure versus post measure	1.668	0.166	<0.001
	Pre measure versus follow up measure	0.693	0.166	<0.001
	follow up measure versus post measure	0.975	0.166	<0.001
Control then shooting	Pre measure versus post measure	1.595	0.129	<0.001
	Pre measure versus follow up measure	0.628	0.129	<0.001
	follow up measure versus post measure	0.967	0.129	<0.001
Control then running with ball then shooting	Pre measure versus post measure	1.652	0.227	<0.001
	Pre measure versus follow up measure	0.496	0.227	<0.001
	follow up measure versus post measure	1.156	0.227	<0.001
Control then evading then shooting	Pre measure versus post measure	1.786	0.199	<0.001
	Pre measure versus follow up measure	0.474	0.199	<0.001
	follow up measure versus post measure	1.311	0.199	<0.001

Table 11: Descriptive statistics: mean, SD = standard deviation and improving ratios between pre, follow up and post measures for performance accuracy measures

	pre measure			follow up measure			post measure			Improvement ratios		
performance accuracy	m	±	SD	m	±	SD	m	±	SD	Pre and follow up	Pre and post	follow up and post
Control then passing	1.376	±	0.192	1.737	±	0.271	2.837	±	0.293	26.246	106.190	63.324
Control then running with ball then passing	1.768	±	0.157	2.125	±	0.182	2.801	±	0.113	20.190	58.405	31.795
Control then evading then passing	2.012	±	0.179	2.291	±	0.175	2.988	±	0.215	13.865	48.508	30.424
Control then shooting	2.073	±	0.195	2.468	±	0.244	3.543	±	0.475	19.075	70.940	43.557
Control then running with ball then shooting	2.219	±	0.308	2.765	±	0.362	3.545	±	0.361	24.593	59.739	28.209
Control then evading then shooting	2.363	±	0.310	2.811	±	0.286	3.475	±	0.389	18.940	47.015	23.605

Table 12: Descriptive statistics for differences between pre, follow up and post measures for performance accuracy measures through ANOVA

variables	disparity source	free degrees	square total	square mean	f	P
Control then passing	between cases	29	2.283	0.079		
	between measures	2	34.754	17.377	295.633	<0.001
	error	58	3.409	0.059		
	total	89	40.447			
Control then running with ball then passing	between cases	29	0.721	0.025		
	between measures	2	16.503	8.251	361.102	<0.001
	error	58	1.325	0.023		
	total	89	18.549			
Control then evading then passing	between cases	29	0.865	0.030		
	between measures	2	15.165	7.583	191.748	<0.001
	error	58	2.294	0.040		
	total	89	18.324			
Control then shooting	between cases	29	3.192	0.110		
	between measures	2	34.738	17.369	162.831	<0.001
	error	58	6.187	0.107		
	total	89	44.116			
Control then running with ball then shooting	between cases	29	3.306	0.114		
	between measures	2	26.633	13.316	109.816	<0.001
	error	58	7.033	0.121		
	total	89	36.972			
Control then evading then shooting	between cases	29	3.518	0.121		
	between measures	2	18.754	9.377	90.113	<0.001
	error	58	6.036	0.104		
	total	89	28.308			

Table 13: Descriptive statistics for dual differences between measures for performance accuracy variables by LSD

variables	Comparisons	Mean difference	value LSD	P
Control then passing	Pre measure versus post measure	1.461	0.125	<0.001
	Pre measure versus follow up measure	1.100	0.125	<0.001
	follow up measure versus post measure	0.361	0.125	<0.001
Control then running with ball then passing	Pre measure versus post measure	1.033	0.078	<0.001
	Pre measure versus follow up measure	0.676	0.078	<0.001
	follow up measure versus post measure	0.357	0.078	<0.001
Control then evading then passing	Pre measure versus post measure	0.976	0.103	<0.001
	Pre measure versus follow up measure	0.697	0.103	<0.001
	follow up measure versus post measure	0.279	0.103	<0.001
Control then shooting	Pre measure versus post measure	1.470	0.169	<0.001
	Pre measure versus follow up measure	1.075	0.169	<0.001
	follow up measure versus post measure	0.395	0.169	<0.001
Control then running with ball then shooting	Pre measure versus post measure	1.326	0.180	<0.001
	Pre measure versus follow up measure	0.780	0.180	<0.001
	follow up measure versus post measure	0.546	0.180	<0.001
Control then evading then shooting	Pre measure versus post measure	1.111	0.167	<0.001
	Pre measure versus follow up measure	0.664	0.167	<0.001
	follow up measure versus post measure	0.448	0.167	<0.001

Table 14: Descriptive statistics: mean, SD = standard deviation and improving ratios between pre, follow up and post measures for visual abilities measures

		Pre measure			Follow up measure			Post measure			Improving ratios		
Visual abilities		m	±	SD	m	±	SD	m	±	SD	Pre and follow up	Pre and post	follow up and post
eye-hand coordination		18.292	±	1.997	20.835	±	1.615	22.176	±	1.550	13.905	21.234	6.434
static visual acuity		20.658	±	1.891	24.713	±	2.076	27.312	±	1.886	19.627	32.211	10.520
dynamic visual acuity		2.739	±	0.828	3.873	±	0.432	4.060	±	0.340	41.396	48.231	4.834
visual perceptual		6.703	±	1.547	9.190	±	1.918	9.245	±	1.306	37.106	37.920	0.594
visual follow up and dominant eye		2.043	±	0.651	3.310	±	0.312	3.969	±	0.311	62.009	94.271	19.914
Visual quick reaction		21.292	±	1.068	18.109	±	1.057	16.664	±	1.741	14.947	21.736	7.982
visual depth	at a distance of 10 m	5.865	±	1.234	5.294	±	1.367	5.075	±	1.123	9.728	13.462	4.136
	of 20 m	8.207	±	2.188	5.604	±	1.973	5.149	±	2.987	31.714	37.262	8.125
	of 30 m	9.852	±	2.192	7.174	±	1.806	6.577	±	2.010	27.181	33.238	8.318
visual perceptual	Vertical up	67.563	±	7.499	73.708	±	10.134	77.074	±	11.071	9.096	14.077	4.566
	Vertical Down	57.882	±	8.074	73.975	±	6.910	74.748	±	9.181	27.802	29.137	1.045
	Horizontal right	81.879	±	6.741	91.659	±	7.435	99.878	±	6.362	11.944	21.982	8.967
	Horizontal left	76.966	±	7.165	88.628	±	5.042	90.762	±	6.497	15.152	17.924	2.407
Visual Efficiency of dominant eye		4.623	±	1.171	5.344	±	1.124	5.995	±	1.611	15.612	29.681	12.169

Table 15: Descriptive statistics for differences between pre, follow up and post measures for visual abilities measures through ANOVA

variables	disparity source	free degrees	square total	square mean	F	P
eye-hand coordination	between cases	29	106.055	3.657		
	between measures	2	233.527	116.764	43.713	<0.001
	error	58	154.925	2.671		
	total	89	494.507			
static visual acuity	between cases	29	113.491	3.913		
	between measures	2	674.747	337.373	89.581	<0.001
	error	58	218.436	3.766		
	total	89	1006.674			
dynamic visual acuity	between cases	29	13.629	0.470		
	between measures	2	30.662	15.331	59.141	<0.001
	error	58	15.035	0.259		
	total	89	59.327			
visual perceptual	between cases	29	81.269	2.802		
	between measures	2	126.504	63.252	25.422	<0.001
	error	58	144.308	2.488		
	total	89	352.082			
visual follow up and dominant eye	between cases	29	5.777	0.199		
	between measures	2	57.496	28.748	137.509	<0.001
	error	58	12.126	0.209		
	total	89	75.398			
Visual quick reaction	between cases	29	54.962	1.895		
	between measures	2	336.339	168.170	99.058	<0.001
	error	58	98.466	1.698		
	total	89	489.768			
at a distance of 10 m	between cases	29	53.588	1.848		
	between measures	2	9.968	4.984	3.552	0.035
	error	58	81.375	1.403		
	total	89	144.931			
at a distance of 20 m	between cases	29	146.903	5.066		
	between measures	2	163.326	81.663	13.030	<0.001
	error	58	363.514	6.267		
	total	89	673.744			
at a distance of 30 m	between cases	29	143.163	4.937		
	between measures	2	182.501	91.250	25.465	<0.001
	error	58	207.832	3.583		
	total	89	533.496			
Vertical up	between cases	29	2393.144	82.522		
	between measures	2	1395.514	697.757	7.013	0.002
	error	58	5770.675	99.494		
	total	89	9559.333			

Table 15: Continued

variables	disparity source	free degrees	square total	square mean	F	P
Down Vertical	between cases	29	2240.709	77.266		
	between measures	2	5439.948	2719.974	45.348	<0.001
	error	58	3478.875	59.981		
	total	89	11159.532			
Horizontal right	between cases	29	1368.519	47.190		
	between measures	2	4871.626	2435.813	51.821	<0.001
	error	58	2726.235	47.004		
	total	89	8966.381			
Horizontal left	between cases	29	1246.036	42.967		
	between measures	2	3308.577	1654.288	43.528	<0.001
	error	58	2204.316	38.005		
	total	89	6758.930			
Visual Efficiency of dominant eye	between cases	29	46.563	1.606		
	between measures	2	28.264	14.132	7.795	0.001
	error	58	105.158	1.813		
	total	89	179.985			

Table 16: Descriptive statistics for LSD to study dual differences between measures for visual abilities

Variables	Comparisons	Mean difference	LSD value	P
eye-hand coordination	Pre measure versus post measure	3.884	0.845	<0.001
	Pre measure versus follow up measure	1.341	0.845	0.002
	Follow up measure versus post measure	2.543	0.845	<0.001
static visual acuity	Pre measure versus post measure	6.654	1.003	<0.001
	Pre measure versus follow up measure	2.600	1.003	<0.001
	Follow up measure versus post measure	4.055	1.003	<0.001
dynamic visual acuity	Pre measure versus post measure	1.321	0.263	<0.001
	Pre measure versus follow up measure	0.187	0.263	0.160
	Follow up measure versus post measure	1.134	0.263	<0.001
visual perceptual	Pre measure versus post measure	2.542	0.815	<0.001
	Pre measure versus follow up measure	0.055	0.815	0.894
	Follow up measure versus post measure	2.487	0.815	<0.001
visual follow up and dominant eye	Pre measure versus post measure	1.926	0.236	<0.001
	Pre measure versus follow up measure	0.659	0.236	<0.001
	Follow up measure versus post measure	1.267	0.236	<0.001
Visual quick reaction	Pre measure versus post measure	4.628	0.673	<0.001
	Pre measure versus follow up measure	3.182	0.673	<0.001
	Follow up measure versus post measure	1.445	0.673	<0.001
at a distance of 10 m	Pre measure versus post measure	0.790	0.612	0.012
	Pre measure versus follow up measure	0.571	0.612	0.067
	Follow up measure versus post measure	0.219	0.612	0.477
at a distance of 20 m	Pre measure versus post measure	3.058	1.294	<0.001
	Pre measure versus follow up measure	2.603	1.294	<0.001
	Follow up measure versus post measure	0.455	1.294	0.484
at a distance of 30 m	Pre measure versus post measure	3.275	0.978	<0.001
	Pre measure versus follow up measure	2.678	0.978	<0.001
	Follow up measure versus post measure	0.597	0.978	0.227
Vertical up	Pre measure versus post measure	9.511	5.155	<0.001
	Pre measure versus follow up measure	3.365	5.155	0.196
	Follow up measure versus post measure	6.145	5.155	0.020
Down Vertical	Pre measure versus post measure	16.865	4.003	<0.001
	Pre measure versus follow up measure	0.773	4.003	0.700
	Follow up measure versus post measure	16.092	4.003	<0.001
Horizontal right	Pre measure versus post measure	17.999	3.543	<0.001
	Pre measure versus follow up measure	8.219	3.543	<0.001
	Follow up measure versus post measure	9.780	3.543	<0.001
Horizontal left	Pre measure versus post measure	13.795	3.186	<0.001
	Pre measure versus follow up measure	2.133	3.186	0.185
	Follow up measure versus post measure	11.662	3.186	<0.001
Visual Efficiency of dominant eye	Pre measure versus post measure	1.372	0.696	<0.001
	Pre measure versus follow up measure	0.650	0.696	0.066
	Follow up measure versus post measure	0.722	0.696	0.042

Table 17: Descriptive statistics for correlation coefficientbetween performance level and velocity and accuracy,where increasing accuracy or velocity led to escalating performance level

variables	Accuracy	velocity
Control then passing	0.425	-0.686
Control then running with ball then passing	0.569	-0.679
Control then evading then passing	0.753	-0.851
Control then shooting	0.682	-0.768
Control then running with ball then shooting	0.951	-0.675
Control then evading then shooting	0.991	-0.975

Table 18: Descriptive statistics for correlation coefficientand visual abilities

Variables		r	P
eye-hand coordination		0.515	0.000
static visual acuity	0.522	0.000	
dynamic visual acuity		0.854	0.000
visual perceptual	0.566	0.000	
visual follow up and dominant eye		0.421	0.000
Visual quick reaction		-0.992	0.000
visual depth	at a distance of 10 m	-0.644	0.000
	at a distance of 20 m	-0.591	0.000
	at a distance of 30 m	-0.790	0.000
visual perceptual	Vertical up	0.670	0.000
	Down Vertical	0.754	0.000
	Horizontal right	0.546	0.000
	Horizontal left	0.691	0.000

Table 19: Descriptive statistics for multi-liner regression as dependent variable and performance quickness where control then evading then passing variable was most effective at 95.1%

	Coefficient			t test		
Variables	P	SD Error	Beta	t	Sig.	determinant
Static	9.047	1.224		7.390	0.000	95.1
Control then evading then passing	-0.889	0.252	-0.555	-3.529	0.001	

Dependent Variable: performance level

Table 20: Descriptive statistics for multi-liner regression between performance level as dependent variable and performance accuracy where control then evading then passing variable was most effective at 95.1%

		coefficient			T test		
	Regression	SD Error	Beta	t	P		determinant
1	static	0.543	0.101		5.399	0.000	98.2
	Control then evading then passing	2.904	0.072	0.991	40.091	0.000	
2	static	0.057	0.174		0.325	0.748	98.7
	Control then evading then passing	2.403	0.168	0.820	14.344	0.000	
	Control then running with ball then shooting	0.584	0.181	0.184	3.225	0.003	

Dependent Variable: performance level

Table 21: Descriptive statistics for multi-liner regression between performance level as dependent variable and visual abilities where Visual quick reaction and dynamic visual acuity were effective at 97%

		Coefficient			T test		
	Regression	SD Error	Beta	t	P		coefficient
1	static	15.692	0.331		47.342	0.000	85
	Visual quick reaction	-0.524	0.016	-0.988	-33.693	0.000	
2	static visual acuity	18.202	0.910		19.998	0.000	97
	Visual quick reaction	-0.627	0.038	-1.182	-16.548	0.000	
	dynamic visual acuity	-0.147	0.051	-0.208	-2.914	0.007	

Dependent Variable: performance level

Table 16 showed statistical significant differences at 0.05 on visual abilities variables between premeasure versus post measure, pre measure versus follow up measure and follow up measure versus post measure, in favor of post measure.

Table 17 illustrated a correlation coefficientbetween performance level and velocity, where increasing velocity led to escalating performance level from 0.679 to-0.975, also there is a correlation coefficient between performance level and accuracy where increasing accuracy led to growing performance level from 0.425 to 0.991.

Table 18 showed that correlation coefficients werestatistically significant where P less than 0.05 on visual abilities variables.

Table 19 showed that most effective variables of performance quickness are Control then evading then shooting where performance level at 95.1% (determinant). Liner regression can be as follows: performance level= 9.047 × control then evading then shooting.

Table 20 Showed that most effective variables of performance accuracy are control then evading then passing, as well as control then running with ball then shooting, where performance level was at 98.7% (determinant).

Liner regression can be as follows: performance level= 0.057+ (2, 4, 3) × control then evading then passing + (0.584) × control then running with ball then shooting

Table 21 showed that most effective visual abilities variables on performance level are Visual quick reaction and dynamic visual acuity where were effective at 97% (determinant). Liner regression can be as follows: performance level= 18.202-(0,627) × Visual quick reaction-(0.147) × dynamic visual acuity.

DISCUSSION

In terms of statistical treatment and referential frame work, it is suggested that there were statistical difference at p 0.05 between pre and post measures on quick and accurate performance with ball relate to complex skills and skilled performance in favor of post measure as show in tables (8-13).

This attributed to training technique for developing skilled complex performance in situational form during matches, where juniors adapted to pressures and conditions of matches, consistent with findings of many studies [6, 19, 22-31].

Additionally, results are compatible with the known facts of previous studies revealing that improvement in performance quickness and accuracy is due to tools and apparatus used, resulted in attitudinal changes and continuity of training how to channel ball towards certain positions along with increasing skilled performance and its velocity in specific times also, accuracy to achieve goals [19,20,32,33].

Further more findings emphasized that the training program had a positive effect on developing skilled complex performance within decrease of overall time for performance and enhancing velocity and accuracy of complex performance by utilizing a training program based on Simulation process of game conditions.

This suggested program enabled juniors to be compatible and integrate skills in one frame characterized with speed, smoothness and skilled performance in offensive complex skills according to game situations. This agreed with results of studies suggested that players acquired many varied forms of skilled complex performance similar to various situations of matches, enable them to select the best in actual matches and maneuver to gain a tactical end [4,23-27, 34].

As well as it is necessary for football player to master many complex tactics of tricks, shooting and making good moves along with team mates [35].

The researcher attributed improvement ratios to direct effect of suggested program, helped junior to gain general compatible abilities through mastery of simple moves in difficult situations, to acquire football specific compatible ability of many tactics and tricks. Thus, improving their performance as mentioned in many studies [19, 20, 22, 24, 25, 32,35].

Findings Related to Visual Abilities: Tables 14-16 showed statistical significant difference at p 0. 05, between findings of pre, follow up and post measures on visual abilities among subjects in favor of post measures, due to the effectiveness of the suggested program of vision training on improving visual abilities among football players, contribute to correct performance and good decision making, according to correct data inside the playing field.

Wrong data processing resulting in delayed actions or incorrect visual reactions affected visual depth and visual perception [36]. Additionally, developing visual skills is essential for enhancing performance [37]. These findings are consistent with many studies concluded that vision training contribute to improvement in visual variables and skilled performance [38-41]. Moreover, visual variables have direct positive effects on performance level among athletes, as they acquired distinguished visual skills more than non athletes, this demonstrates why trained football players have ability to evaluate skillfully what inside the field [42].

The researcher explained that learning and training process using vision training had a positive impact on subjects, consistent with results of relevant literature, that visual abilities can be developed for skilled performance [14, 15, 43]. Furthermore visual skills are similar to physical skills, since they could be learnt, practiced and developed, processing traveling visual data to perform inside playing field [44].

Additionally, these training programs have a positive effect on developing individual capabilities in organizing motor system and adapting motor performance to gain optimal results technically [45]. Many studies suggested that visual training programs contribute to improving visual abilities and skilled performance resulted in effective visual perceptions and selecting appropriate skilled performance for different situations of matches [46-48].

Discussing results of correlation and regression factors:

Table 17 showed a correlation between performance level and velocity measurements, inversely related as an increase in speed (reduced time) leads to an increased performance level. Correlation coefficients were between 0.679 and 0. 975.

There is also a direct correlation between accuracy measuresand performance level where increased accuracy leads to increased performance level. Correlation coefficients were between 0.425 and 0.991.

Table 18 showed that all correlation coefficients were statistically significant as the value of the significance P-value was less than 0.05 where a direct correlation between performance level and: eye-hand coordination,

- Static visual acuity
- Dynamic visual acuity
- Visual perceptual
- Visual follow up and dominant eye
- Visual quick reaction

In addition, regarding visual perceptual there was an inverse correlation between visual depth and Visual quick reaction.

Table 19 indicated that control then evading then shooting was the most effective variable of performance quickness at performance level of 95.1% (coefficient of determination) and this correlation was significant so the regression equation can be as follows:performance level = 9.047-(0.889) × control then evading then shooting.Table 20 indicated that Control then evading then passing and Control then running with ball then shooting were the most effective variables of performance accuracy at performance level of 98.7% (coefficient of determination) pointing out that any change of 98.7% in performance level is due to performance accuracy variables, where the regression equation can be as follows:

performance level = 0.057 + (2.403) × control then evading then passing + (0.584) × control then running with ball then shooting

Table 21 showed that Visual quick reaction and dynamic visual acuity were the most effective variables of performance accuracy at performance level of 97% (coefficient of determination) pointing out that 97% of changes in performance level were due to these visual abilities, where the regression equation can be as follows:

Performance level = 18.202-(0.627) × Visual quick reaction-(0.147) × dynamic visual acuity.

Thus, it is emphasized to examine the relationship between two variables or more, in order to use this relationship in estimating, directing or predicting the values of these variables and find out methods to address problems about directing or predicting by regression. This problem of linear predicting is due to the problem ofreconciling straight line to a set of points [49].

As mentioned above, we concluded that the training schedule for complex skills, the training program for visual abilities and correlation coefficients and regression have achieved their objectives, e.g. quick, accurate motor performance with the ball related to complex performance, as well as to improve the performance of visual abilities which have positive impact on skilled performance levelin football juniors.

CONCLUSION

In the light of research results, it is concluded that:

- 6 skilled complex performance tests can be utilized as objective tools for measure, sorting and improving performance among juniors.
- The suggested program had a positive effect on developing velocity and accuracy of skilled performance and certain skilled complex performance.
- Subjects showed improvements in measures regarding skilled complex performance related to passing and shooting due to attitudinal drills.
- Actual training through skilled complex performance under study and attitudinal drills improved junior levels.
- Subject-visual abilities improved in favor of post measure.

Recommendations: In terms of statistical anaylis of data and research results and scope of study, it is recommended to:

- Ensure training juniors on complex skilled performance.
- Ensure progression of training on complex skilled performance; from easy to difficult task, from simple to complex task. From known to unknown, according to age and attitudinal drills.
- Benefit of study findings to evaluate velocity and accuracy of motor performance and skilled performance.
- Apply the suggested program on juniors in other sport activities especially team games.
- Pay attention to activate role of visual drills in sport field especially football.
- Take into consideration difference between motor perceptual variable and Visual training variable.
- Further studies needed to examine vision training effects on other subjects and sports

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