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RESEARCH ARTICLE

Investigation of The Effects of Combined and Traditional Trainings Applied to Football Players in the Infrastructure on Multiple Performance Developments

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Abstract
The aim of this research is to investigate the effects of combined and traditional training applied to football players on multi-faceted performance development. Experimental research model from quantitative research was used in this study. This study sports infrastructure Antalyaspor the average age of 12,3±0,2 a year, training the average age of 3,5±0,7 with 12 years Combined Training Group (CTG) and the mean age of 12,2±0,1 years of training average age 4,0±0,7 year 12 Normal Training Group (NTG) to 24 male soccer player voluntarily participated. Before and after the 8-week training period, anthropometric measurement (length, width, circumference, subcutaneous fat), posture analysis, physiological tests; heart rate measurements, blood pressure, biomotoric tests; strength, sprint, flexibility, vertical jump, maximal strength (1RM), sit-ups, push-ups, standing long jump, jump rope, sit-reach, FutTech Technical tests (slalom, dribbling, passing, shooting, running), body temperature, ambient temperature and determination of perceived difficulty level tests were carried out. When the CTG and NTG pre-test and post-test data were examined, a statistically significant difference was found in the pre-test biomotoric tests in standing long jump, lat pull and FutTech time values ($p<0.05$). A statistically significant difference was found in the lat pully and abdominal values of the CTG and NTG end test values in the biomotanical tests ($p<0.05$). Based on the data we have obtained, it has been determined that combined training performed in children in the infrastructure contributes to the development of some biomotoric features and supports the development of football-specific technical skills compared to normal training programs.

Keywords
Football, Combined Traning, Performance, Futtech

INTRODUCTION

Football; It is the art of scoring and not scoring goals with or without the ball, which is based on the principles of attack and defense, which alternates between attack and defense, and which is based on running away, creating an empty field, man and field marking, and includes many variations with or without the ball (Dağdelen, 2022). Although football has many different definitions today, the most effective and short definition is the expression "beautiful game" made by the world-famous football star Pele (Kirkendall and Sayers, 2020).

With the introduction of the football game to boarding schools and the establishment of clubs, it is possible to see various elements in the development of today's football, including debates on whether football will be a recreational tool or a profession as amateurs (Koller & Braendle, 2015). Football, which has managed to reach large masses due to the popularity of football and its loving

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practice by various communities, is one of the branches with the highest level of interest (Stolen et al., 2005). Football physiologically, aerobic and anaerobic performance are applied respectively, strength, endurance, power, mobility, speed, skill and agility, etc. It is the branch of sports in which the elements affect the performance at the primary level. In football, which is considered as a branch based on such a variety of performance activities in order to achieve success, besides physical, physiological, mental, technical and tactical, the anthropometric and motoric characteristics of the athlete are of great importance. At the same time, it has been reported that there have been significant increases in the technical, tactical, physical, physiological and mental capacities of football players due to the changes and developments in football in recent years (Carling et al., 2012).

From an early age, children and young people play football everywhere and under all conditions, and some of them take this sport to professional levels by getting their education from the infrastructure. In professional football, children and young people need to develop some skills and undergo a serious training in the infrastructure in order to show better performance and improve themselves in this branch (Çolak, 2016: 3). Football is a sports activity that is followed by everyone due to various sporting variations (passing, shooting, dribbling, sudden movements, acceleration, stopping, deceptions, etc.), in order to be successful, physical, physiological and physiological performance and successful results for football player children and youth. It is of great importance to analyze motoric, tactical and morphological aspects (Zakas, 2005). In addition, coaches and sports scientists today practice dribbling with or without the ball, sprinting, shooting, passing, etc. technical skills and strength, speed, endurance, coordination, flexibility, etc. In addition to using traditional exercises to improve motoric performance, they also try modern new training methods. Among the new training methods, combined training, core training and various new training models, which are considered to be helpful, can be applied in order to make these features more efficient and to take them to the next level (Aslan, 2014). Even if football is played everywhere and on any ground, a long-term education and training process is needed. Taking into consideration the long-term education and training of the condition, technical and tactical needs of the game in football, and the developmental characteristics of the game, athletes should do exercises at an increasing level and intensity (Spirduso, 1995). The high number of young people in our country is an indicator of the need to attach great importance to club infrastructure and the efforts made for their development. For this reason, football trainings to be applied to children and young people must be scientific and coordinated (Eniseler, 2009).The aim of this research is to investigate the effects of combined and traditional training applied to football players on multi-dimensional performance development.

MATERIALS AND METHODS

Study Design

The research was carried out with 24 male football players in the age group of 12 struggling in the infrastructure of Antalyaspor Club. Inclusion criteria for the study; All football players participating in the study were boys, were 12 years old when the study was conducted, actively participated in their own training, documenting that they were licensed athletes, having a sports history of at least 3 years, not having been injured in the last 6 months, having family approval, participating voluntarily, not having any chronic disease and not using drugs continuously. Athletes who met the research criteria were divided into 2 groups as 24 male football players, 12 Combined Training Group (CAG) and 12 Normal Training Group (NTG). The study was initiated after the approval of the Akdeniz University Clinical Research Ethics Committee.

Data Collection

As a research methodology; anthropometric measurement (length, width, circumference, subcutaneous fat), posture analysis (anterior, lateral), physiological tests; heart rate measurements, blood pressure, biomotoric tests (strength, sprint (5m / 10 m / 20 m), flexibility, vertical jump, maximal strength test (1RM), sit-ups, push-ups, standing long jump, jump rope, sit-reach, FutTech Teknik tests (dribbling, passing, shooting), body temperature, ambient temperature, perceived difficulty level (RPE- Rating Of Perceived Exertion) were planned and carried out. The first measurements were made before the training and after the combined training programs, which were carried out 3 times a week for 8 weeks

(including 1-1.5 hours of warm-up phase-main phase-cooling-down phase on Monday, carried out again at the end of the training program. 15 minutes per unit training. In the warm-up-preparation, 30-45 minutes main phase, a combined training program was applied to improve strength, technique, sprinting, mobility, flexibility, dribbling, passing, shooting and similar features. The finishing phase is 10 minutes. It is finished with cooling and stretching work.

Postür Analiz

Wednesday, Friday /day), measurements were

In the APPA-Postural analysis system, angular analyzes were made from the anterior and lateral directions on the photograph via a computer program. Photographs were taken with a Canon camera. Head, neck, shoulder, back, elbow, wrist, chest, hip, knee, ankle and heel regions were evaluated according to the ideal posture accepted as standard (Kılınç, 2021).

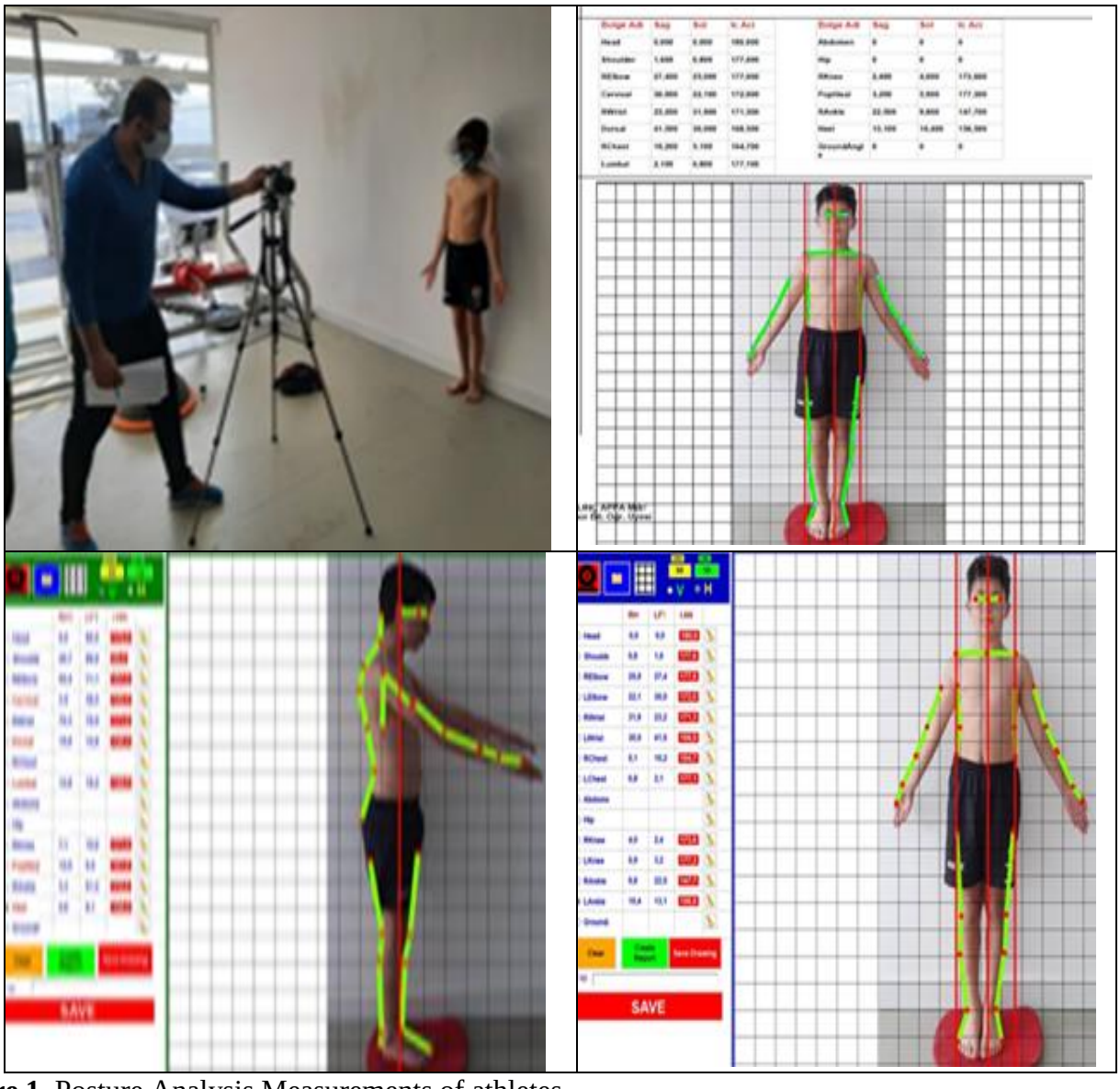

Figure 1. Posture Analysis Measurements of athletes

FutTech Technical Test

Before starting the test, heart rate, ambient and body temperature, blood pressure were measured, and then the subject was asked to leave. The athlete, who comes out of the starting point through the photocell, first sprints for 10 meters, dribbles between the cones 5 meters, and then approaches the ball 2,5 meters. To the miniature castles at a distance of 5 meters from behind, first the right foot, then the left foot, goal kick, 10 meters sprint, 5 meters wall pass, then back to the center point, then 15 meters straight sprint running

by turning, at the end immediately inside the right foot and inside the left foot throwing the ball to the targets, dribbling for 10 meters with the remaining ball, at the end of the ball to the target from the cone, then the 1st ball standing on the penalty area arc will cross the goal with the right foot, the 2nd will shoot the ball with the free foot to the desired point, and the 3rd will shoot the ball to the diagonal corner with the left foot immediately At the end of the test, the athletes will finish the technical test by running at full speed to the finish point. At the end of the test, slalom (6 x 5 points = 30 points), accurate passes to small goals (2 x 10 points = 20 points), wall passes (1 x 5 points = 5 points), right-left in-foot hits on targets (2 x 10 points =20 points), long pass after dribbling (1 x 10 points=10 points), goal kick to big goal (3 x 5 points =15 points) are indexed to a total of 100 points and FutTech score is calculated by taking into account the finishing times. At the end of the FutTech (football technical test), heart rate, ambient and body temperature, blood pressure values were taken again**.**

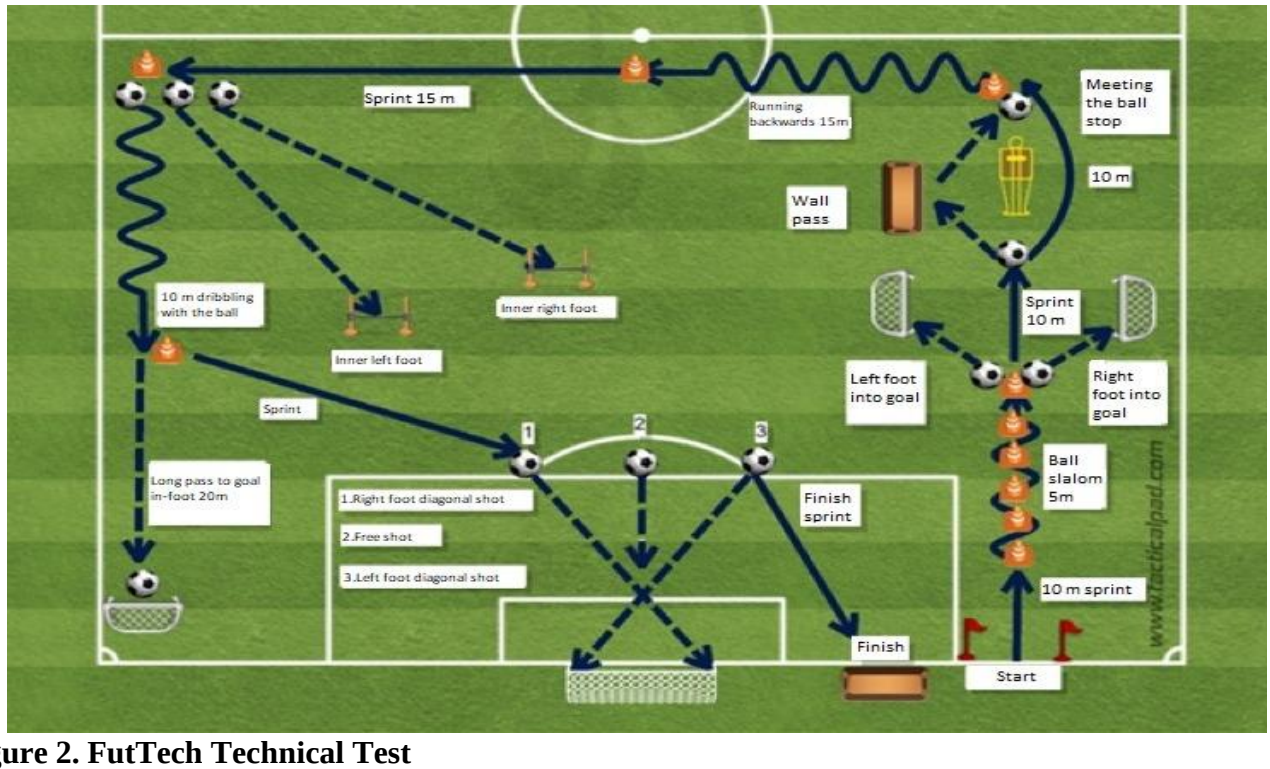

Figure 2. FutTech Technical Test

Determining the Rating of Perceived Exertion (RPE)

It is a method used to measure the perceived exertion rate of the person or the degree of difficulty of the exercise. The highest value on the scale is 20 and the least is 6. The increasing value between the numbers 6 and 20 indicates that the perceived difficulty level of the exercise increases. The scale was created in 1982 by Gunnar Borg. The players will be shown the 6-20 Borg scale and asked how much they push themselves while applying the FutTech Test. The answers given by the athletes are recorded in the measurement form and evaluated as the degree of difficulty perceived by the athlete during the exercise.

Statistical Analysis

Calculated using Statistics 26.0 and Excel (Analyes Tool Pack) program for statistical analysis. After applying the Kolmogorov-Smirnov test to determine the distribution of all measurements, it was determined that the distribution was at a normal level and it was decided to apply parametric tests. First, descriptive statistics of the data were performed and Paired T test and Independent T test were used in statistical analysis. Paired T test was used to compare within-group pre-test and post-test mean, and Independent T test was used to compare between-group means. Standard deviation and arithmetic mean values were calculated for all variables. In this study, the alpha value will be accepted as 0.05 in all statistical analyzes.

RESULTS

Table 1. Length measurement findings of combined and normal training group

VARİABLE (cm)	GROUP	AO±SS (pre-test)	AO±SS (post-test)	t (Pre-test)	t (Post-test)	P (Pre-test)	P (Post-test)
Fathom	CTG	150.8±9.5	151.1±9.7	-.383	-.330	.706	.745
	NTG	152.1±6.0	152.2±6.0				
Bust	CTG	78.2±2.9	78.3±2.9	-1.262	-1.247	.220	.225
	NTG	79.7±2.8	79.8±2.8				
Whole arm	CTG	65.6±3.5	65.6±3.5	.120	.114	.906	.910
	NTG	65.4±3.2	65.5±3.2				
Shoulder-elbow	CTG	26.8±1.7	26.9±1.7	.245	.228	.809	.822
	NTG	26.6±1.5	26.7±1.5				
Forearm	CTG	24.8±1.6	24.9±1.6	1.364	1.393	.186	.179
	NTG	24.0±1.1	24.1±1.1				
Thigh	CTG	39.1±3.1	39.2±3.1	-.522	-.551	.607	.589
	NTG	39.6±1.7	39.8±1.6				
Calf	CTG	37.1±2.8	37.2±2.9	,081	.071	,936	.944
	NTG	37,0±2,0	37.1±2.1				
Foot	CTG	22,4±1,4	22.5±1.4	-1.030	-.925	.314	.365
	NTG	23,0±1,4	23.0±1.4				

Note: CTG: Combined Training Group, NTG: Normal Training Group

Table 2. Width measurement findings of combined and normal training group

VARİABLE (cm)	GROUP	AO±SS (pre-test)	AO±SS (post-test)	t (Pre-test)	t (Post-test)	P (Pre-test)	P (Post-test)
Biacromial	CTG	32.7±1.8	32.7±1.8	-1.839	-1.841	083	.083
	NTG	33.8±1.0	33.9±1.0				
Chest diameter	CTG	23.4±1.1	23.5±1.2	-.985	-.869	.336	.394
	NTG	23.9±1.2	23.9±1.2				
Chest depth	CTG	17.7±1.1	17.8±1.1	.395	.432	.697	.670
	NTG	17.5±1.0	17.6±1.0				
Biiliac	CTG	24.1±1.4	24.1±1.4	-1.465	-1.504	.157	.147
	NTG	25.0±1.5	25.0±1.5				
Bitrhroconteric	CTG	26.7±1.4	26.8±1.4	-.904	-.884	.376	.386
	NTG	27.3±1.5	27.3±1.5				
Humerus bicondiler	CTG	5.8±0.4	5.9±0.4	-.284	-.129	.779	.899
	NTG	5.9±0.5	5.9±0.4				
Wrist	CTG	4.7±0.4	4.8±0.3	.688	.738	.498	.468
	NTG	4.6±0.3	4.7±0.3				
Femur bicondiler	CTG	9.6±0.6	9.7±0.6	.255	.471	.801	.643
	NTG	9.6±0.6	9.6±0.6				
Ankle	CTG	7.0±0.4	7.0±0.4	-.077	-.385	.939	.704
	NTG	7.0±0.6	7.1±0.6				

Note: CTG: Combined Training Group, NTG: Normal Training Group

Table 3. Perimeter measurement findings of the combined and normal training group

VARİABLE (cm)	GROUP	AO±SS (pre-test)	AO±SS (post-test)	t (Pre-test)	t (Post-test)	P (Pre-test)	P (Post-test)
Shoulder	CTG	86.1±4.6	86.3±4.6	-1.639	-1.598	.117	.126
	NTG	88.9±3.4	89.0±3.4				
Chest normal position	CTG	72.5±3.7	72.6±3.7	.967	1.039	.344	.310
	NTG	71.0±3.6	71.0±3.6				
Chest expirations	CTG	70.2±3.7	70.4±3.8	.626	.725	.537	.476
	NTG	69.3±3.7	69.3±3.7				
Chest ınspiration	CTG	76.4±4.0	76.7±4.0	.786	.907	.440	.374
	NTG	75.2±3.6	75.2±3.6				
Abdomen	CTG	69.8±4.4	70.8±5.0	-.729	-.091	.474	.928
	NTG	71±3.2	70.9±3.2				
Hip	CTG	78.8±5.0	78.9±4.9	-.589	-.520	.562	.609
	NTG	80.0±4.8	80.0±4.7				
Thigh	CTG	47.0±3.9	47.2±3.9	.288	.417	.776	.681
	NTG	46.6±2.6	46.6±2.6				
Calf	CTG	31.4±3.1	31.5±3.1	.782	.932	.443	.362
	NTG	30.4±2.8	30.3±2.7				
Biceps flexion	CTG	23.7±2.3	23.8±2.4	-.994	-1.321	.332	.202
	NTG	24.6±1.8	25.4±3.4				
Forearm	CTG	21.6±1.4	21.7±1.4	-.782	-.693	.442	.495
	NTG	22.0±1.3	22.1±1.3				

Note: CTG: Combined Training Group, NTG: Normal Training Group

Table 4. Subcutaneous fat measurement findings of the combined and normal training group

VARİABLE (cm)	GROUP	AO±SS (pre-test)	AO±SS (post-test)	t (Pre-test)	t (Post-test)	P (Pre-test)	P (Post-test)
Thigh	CTG	11.9±4.0	12.5±3.3	.656	.776	.519	.447
	NTG	10.9±2.9	11.5±2.6				
Calf	CTG	8.0±2.3	7.8±2.3	1.191	1.296	.246	.209
	NTG	6.9±2.2	6.6±2.2				
Suprailiac	CTG	6.2±2.0	6.0±1.9	1.718	1.711	.101	.102
	NTG	4.9±1.4	4.8±1.4				
Abdominal	CTG	9.3±3.7	9.0±3.8	.518	.536	.609	.597
	NTG	8.5±3.8	8.2±3.8				
Subscapulaa	CTG	5.4±1.0	5.2±1.0	-.879	-.753	.390	.460
	NTG	5.8±1.5	5.6±1.4				
Triceps	CTG	9.2±1.8	8.9±1.6	.063	.270	.950	.790
	NTG	9.2±2.5	8.7±2.6				
Biceps	CTG	5.7±2.4	5.8±2.7	1.563	1.867	.144	.082
	NTG	4.5±1.2	4.2±1.1				
Chest	CTG	6.1±1.9	6.2±1.9	.177	.688	.861	.499
	NTG	6.0±2.1	5.7±2.2				
Body fat percentage (%)	CTG	7.9±1.1	7.9±1.0	.731	.947	.473	.354
	NTG	7.6±0,8	7.5±0.9				

Note: CTG: Combined Training Group, NTG: Normal Training Group

Table 5. Posture analysis anterıor measurement findings of combined and normal training group

VARİABLE	GROUP	AO±SS (pre-test)	AO±SS (post-test)	t (Pre-test)	t (Post-test)	P (Pre-test)	P (Post-test)
Head	CTG	175.2±4.3	176.3±2.6	-.049	1.563	.962	.133
	NTG	175.3±4.8	174.4±3.3				
Shoulder	CTG	176.4±2.8	177.0±2.5	-.054	-.157	.958	.877
	NTG	176.4±2.5	177.2±1.8				
Right elbow	CTG	171.5±4.6	174.8±3.8	-1.809	.624	.084	.539
	NTG	174.9±4.4	174.0±3.0				
Left elbow	CTG	172.6±5.2	174.0±3.8	-.716	.662	.482	.515
	NTG	174.0±4.0	173.0±3.6				
Right hand wrist	CTG	172.0±6.3	170.5±6.6	-2.457	-.657	.073	.518
	NTG	172.0±5.2	172.2±6.0				
Left hand wrist	CTG	164.3±5.1	163.6±8.7	-.047	-.880	.963	.388
	NTG	164.4±4.4	166.6±7.9				
Chest right	CTG	174.5±5.1	175.3±4.1	1.489	1.187	.151	.249
	NTG	171.3±5.4	173.0±5.5				
Chest left	CTG	173.4±4.5	173.5±4.4	1.529	.470	.141	.643
	NTG	170.5±4.7	172.5±5.0				
Right knee	CTG	170.3±5.2	174.5±3.6	-2.619	1.664	.016	.113
	NTG	175.2±3.9	171.2±5.7				
Left knee	CTG	175.1±4.4	174.0±2.9	-.514	.787	.614	.440
	NTG	175.9±2.0	173.2±2.3				
Right foot	CTG	150.6±4.9	154.6±4.0	-1.021	.849	.321	.405
	NTG	153.7±9.0	153.0±4.8				
Left foot	CTG	154.2±4.8	151.2±3.9	-.568	-1.848	.576	.078
	NTG	155.2±3.6	154.4±4.5				

Note: CTG: Combined Training Group, NTG: Normal Training Group

Table 6. Posture analysis lateral measurement findings of combined and normal training groups

VARİABLE	GROUP	AO±SS (pre-test)	AO±SS (post-test)	t (Pre-test)	t (Post-test)	P (Pre-test)	P (Post-test)
Head	CTG	175.3±3.0	172.4±4.0	1.689	-.022	.109	.93
	NTG	172.4±5.1	172.4±3.4				
Shoulder	CTG	59.1±7.7	54.8±8.3	.170	1.292	.866	.210
	NTG	58.5±7.6	50.3±8.9				
Right elbow	CTG	169.5±8.9	173.5±4.7	.332	-1.093	.745	.286
	NTG	166.2±33.3	175.5±4.3				
Neck	CTG	140.7±10.4	142.5±11.8	1.552	-.102	.135	.920
	NTG	134.4±9.5	142.9±11.4				
Right wrist	CTG	173.4±4.9	174.7±4.0	-.970	-.828	.344	.418
	NTG	175.1±3.4	175.8±2.7				
Dorsal	CTG	157.3±7.3	156.9±6.5	-.903	.960	.378	.348
	NTG	159.6±4.7	154.0±7.9				
Lumball	CTG	140.9±5.2	142.8±2.7	-1.282	-1.904	.216	.072
	NTG	144.7±8.5	145.5±3.9				
Right knee	CTG	173.7±5.1	174.0±6.7	-.707	.156	.490	.569
	NTG	174.9±2.5	173.6±5.5				
Popliteal	CTG	165.4±3.7	168.9±4.8	-.547	.578	.591	.569
	NTG	166.5±6.0	167.7±5.0				
Right ankle	CTG	112.2±4.0	113.9±4.5	-2.323	-1.573	.031	.130
	NTG	117.3±6.3	117.2±5.4				
Heel	CTG	161.5±6.2	161.4±6.0	.115	-.075	.910	.941
	NTG	161.8±4.1	161.6±6.0				

Note: CTG: Combined Training Group, NTG: Normal Training Group

Table 7. Physiological measurement findings of the combined and normal training group

VARİABLE (cm)	GROUP	AO±SS (pre-test)	AO±SS (post-test)	t (Pre-test)	t (Post-test)	P (Pre-test)	P (Post-test)
Heart beats beginning	CTG	94.9±15.7	100.2±16.0	.772	.271	.449	.789
	NTG	90.2±13.8	98.2±19.8				
Heart beats finishing	CTG	124.7±14.1	158.5±23.8	.951	-.424	.352	.676
	NTG	119.6±12.0	162.2±18.0				
Systolic beginning	CTG	123.9±12.1	118.5±13.3	-.560	1.228	.581	.235
	NTG	126.7±12.5	113.0±7.8				
Diastolic beginning	CTG	79.2±11.8	73.2±10.5	-1.257	-1.146	.224	.265
	NTG	87.0±17.7	77.6±8.1				
Systolic finishing	CTG	141.5±18.0	146.5±21.1	-.889	-.435	.384	.669
	NTG	148.9±22.1	149.6±13.8				
Diastolic finishing	CTG	85.8±20.1	91.7±19.9	.138	-1.466	.892	.164
	NTG	84.9±11.1	100.9±8.3				
Body temperature start	CTG	35.9±0.3	36.3±0.6	-1.082	.658	.292	.519
	NTG	36.1±0.4	36.1±0.3				
Body temperature finish	CTG	36.3±0.3	37.0±1.0	-1.859	-.432	.076	.672
	NTG	36.6±0.3	37.1±0.4				
Environment temperature start	CTG	17.1±0.0	41.1±0.0	-1.483	-3.370	.152	.126
	NTG	17.1±0.0	41.2±0.0				
Environment temperature finish	CTG	17.1±0.0	41.1±0.0	-1.483	-3.370	.152	.126
	NTG	17.1±0,0	41.2±0.0				

Note: CTG: Combined Training Group, NTG: Normal Training Group

Table 8. Maximal 1RM measurement findings of combined and normal training group

VARİABLE (cm)	GROUP	AO±SS (pre-test)	AO±SS (post-test)	t (Pre-test)	t (Post-test)	P (Pre-test)	P (Post-test)
Leg press	CTG	26.5±3.6	27.1±3.4	1.503	.408	.148	.688
	NTG	24.5±2.7	26.6±2.4				
Leg extentıon	CTG	38.7±11.7	38.7±10.1	.508	.022	.617	.983
	NTG	36.6±8.0	38.6±8.6				
Leg curl	CTG	35.0±7.9	38.0±8.2	-.549	-.084	.589	.934
	NTG	36.6±6.8	38.3±6.1				
Calf raise	CTG	21.0±4.7	23.0±5.4	.861	.985	.400	.341
	NTG	19.6±3.1	21.4±2.2				
Biceps curl	CTG	17.3±2.8	19.5±3.9	-1.317	-.518	.202	.610
	NTG	18.7±2.2	20.4±3.9				
Lat puly	CTG	18.7±3.1	20.5±3.1	-2.940	-3.234	.009	.005
	NTG	24.1±5.5	26.2±5.2				
Butter fly	CTG	11.2±3.7	13.5±4.0	-.573	-1.040	.573	.310
	NTG	12.0±3.3	15.2±3.7				
Abdominal	CTG	9.0±1.6	10.5±2.1	-4.435	-3.580	.000	.002
	NTG	12.2±1.9	14.4±3.0				
Triceps	CTG	16.6±4.0	19.6±4.3	.506	.465	.618	.647
	NTG	15.8±4.0	18.7±5.2				

Note: CTG: Combined Training Group, NTG: Normal Training Group

Table 9. Biomotoric tests measurement findings of the combined and normal training group

VARİABLE (cm)	GROUP	AO±SS (pre-test)	AO±SS (post-test)	t (Pre-test)	t (Post-test)	P (Pre-test)	P (Post-test)
Standing long jump (cm)	CTG	168.8±15.1	192.9±22.6	2.383	1.428	.026	.169
	NTG	152.8±17.6	181.7±14.8				
Flexibility (cm)	CTG	15.9±5.5	26.8±34.5	1.707	1.308	.102	.216
	NTG	11.9±5.7	13.6±5.0				
Push-up (pcs)	CTG	26.7±4.2	26.4±3.6	.945	1.029	.358	.318
	NTG	24.1±8.4	24.2±6.3				
Crunch (pcs)	CTG	23.0±7.5	21.1±4.0	.793	.085	.438	.933
	NTG	21.0±4.3	21.0±5.4				
Rope (pcs)	CTG	63±15.8	62.4±15.7	.681	.713	.503	.484
	NTG	58.7±14.7	58.0±14.5				
Vertical jump double foot (cm)	CTG	31.0±6.6	32.5±6.1	1.311	1.624	.204	.119
	NTG	27.7±5.8	28.7±5.3				
Vertical jump right foot (cm)	CTG	16.5±3.0	19.1±3.7	.529	.995	.603	.331
	NTG	15.6±4.4	17.5±4.0				
Vertical jump left foot (cm)	CTG	16.8±3.9	19.1±3.7	1.681	1.549	.107	.136
	NTG	14.2±3.5	16.8±3.6				
5m Sprint (sec/ss)	CTG	1.4±.10	1.4±0.3	-1.096	-.396	.290	.698
	NTG	1.4±.21	1.4±0.1				
10m Sprint (sec/ss)	CTG	2.3±.15	2.1±0.1	.315	-1.306	.756	.205
	NTG	2.2±.17	2.2±0.1				
20m Sprint (sec/ss)	CTG	3.8±.20	3.6±0.2	-1.148	-1.861	.267	.077
	NTG	3.9±.38	3.9±0.3				

Note: Cm: centimeter, Sec: second, Pcs: piece, Ss: split second, CTG: Combined Training Group, NTG: Normal Training Group

Table 10. FutTech Technical test measurement findings of combined and normal training group

VARİABLE (cm)	GROUP	AO±SS (pre-test)	AO±SS (post-test)	t (Pre-test)	t (Post-test)	P (Pre-test)	P (Post-test)
Funnel slalom	CTG	29.5±1.4	29.5±1.4	-1.000	-1.000	.339	.339
	NTG	30±0.0	30±0.0				
2 Passes from foot inner	CTG	5.8±5.1	6.6±7.7	-.348	.928	.732	.365
	NTG	6.6±6.5	4.1±5.1				
Wall rust	CTG	5±0.0	5±0.0	1.000	1.483	.339	.166
	NTG	4.5±1.4	4.1±1.9				
2 Passes to target	CTG	1.6±3.8	1.6±3.8	-.920	-.484	.368	.633
	NTG	3.3±4.9	2.5±4.5				
Long pass (1 pcs)	CTG	1.6±3.8	1.6±3.8	-.920	.000	.368	1.000
	NTG	3.3±4.9	1.6±3.8				
3 Shots on goal	CTG	13.3±2.4	12.5±4.5	-348	.886	.732	.385
	NTG	12.9±3.3	10.8±4.6				
Total score futtech	CTG	57.9±8.3	57.0±11.9	-.604	.863	.552	.398
	NTG	60±8.5	53.3±9.1				
Time	CTG	3481.7±2106.4	4283.3±271.7	-2.457	-.407	.030	.688
	NTG	5009.3±450.0	4339.9±397.3				
BORG	CTG	9.6±2.4	9.5±1.5	-1.202	-1.013	.242	.322
	NTG	10.8±2.3	10.2±1.7				

Note: CTG: Combined Training Group, NTG: Normal Training Group, Pcs: piece

DISCUSSION

According to our findings; When the pre- and post-test data of the Combined Training Group and Normal Training Group were examined, a statistically significant difference was detected in the standing long jump, lat pully and FutTech time values in the pre-test biomotoric tests ($p<0.05$).In the post-test values of the Combined Training Group and Normal Training Group, a statistically significant difference was detected in the lat pully and abdominal values in biomotoric tests ($p <0.05$). We can say that the combined training carried out in children in the infrastructure contributes to the development of some motor skills, has positive effects on body composition and supports the development of football-specific technical skills.

Rinaldo (2021) found the mean height of the athletes as 152.58± 8.15 in the first measurement, and 157.42±8.92 in the second measurement, in the study carried out on 48 male football players with an average age of 12.54±0.50. Toselli et al. (2021), 61 basketball players, 62 football players and 68 athletes with a mean age of 13.0±1.1, in the study examining the Differences between Maturity, Anthropometric and Morphological Characteristics among non-athletes, reported that it was 159.0±13.5. In the study of Nıcolaidis (2011) on Anaerobic Strength in Adolescence in Football Players, the average age of the athletes was 12.67 years, and the body weight was 47.60±10.40 kg. Vänttinen et al. (2010) in the study carried out on football skills in adolescent football players, the average age of the athletes was reported as 12.04 years and body weight as 42.30±8.40 kg. Abdullah et al. (2016) In a study investigating football technical skills related to the relative performance of young football players on 184 male football players with a mean age of 15.2±2.0 years in Malaysia, the mean bust length was 86,860± 5,763 cm. as detected. Clemente et al. (2021) 486 athletes under the age of 13 (N=22) with an average age of 12.4 ± 0.4 years participated in the study, in which the relationship between anthropometry, body composition, maturation and competition selection in young football players, the bust length of athletes with an average age of 77.8 ± 3.6 cm participated Dec. it has been identified as. Gontarev et al. (2016) in the study examining the anthropometric and somatotype characteristics of young Macedonian football players, the mean wrist width measurements of 14 year old football players were 5.36±0.39 cm., the average knee width measurements were 9.98±0.64, the average elbow width was 7.42±0.69 cm. as reported.

Canhadas et al. (2010) in a study in which anthropometric characteristics and physical fitness parameters were determined in football players aged 10-13; elbow width for subjects aged 10 years; 5.8± 0.5 cm. and for the 11 age group; 5.8±0.5 cm., and the mean knee width for the 10-year-old subjects; 8.6±0.7 cm. and for the 11 age group; They found it to be 8.8±0.6 cm.. Karabulak (2013) In a study investigating the effects of combined training in male players aged 12–14, circumference was measured from shoulder, one shoulder, arm, forearm, chest normal position, chest inspiration, chest expiration, abdomen, hip, quadriceps, calf points and only circumference was measured by one single circumference. significant difference was found in shoulder values ($p<0.05$). Vithanege et al. (2008) compared skinfold thickness with different techniques and methods in children and compared the mean triceps skinfold thickness of girls; 15.7±6.3 mm., mean triceps Skin Fold Thickness of the male group; 12.3±6.6 mm., mean suprailiac skin fold thickness of girls; 19.5±9.9 mm., the mean suprailiac Skin Fold Thickness of the male group; 15.7 ± 11.4 mm., mean subscapula Skin Fold Thickness of girls; 15.4±9.4 mm., the mean skinfold thickness of the male group subscapula; 11.5±9.1 mm., mean calf skinfold thickness of female athletes; 17.9±7.9 mm., and the mean calf skinfold thickness in the male group was 15.6±8.6 mm. as they found. Gontarev et al. (2016) in the study examining the anthropometric and somatotype characteristics of young Macedonian football players, the average of the biceps Skin Fold Thickness of 14-year-old football players was 6.52±6.23 mm, the mean of the triceps Skin Fold Thickness was 9.80 ±3.35 mm, the thigh Skin Fold Thickness was 4.94±5.17 mm., the subscapular skin Mean Fold Thickness 8.77±3.19 mm, calf Skin Fold Thickness 12.23±3.56 mm, abdominal Skin Fold Thickness 9.00±4.00 mm. have been detected.

Polat (2019) examined the effect of posture analysis on physical performance in football players aged 10-12, and it was reported that no significant difference was found between the level of foot straightening and outward turning in the posture anterior analysis, and performance, and

there was a significant difference between the knee inward movement and flexibility values. In the same study, a significant difference was found between the waist pit and flexibility values in the analysis performed in the Lumbo Pelvic-Hip Complex sections, and as a result, it was reported that postural elements and performance values were directly related in football players aged 10-12.

In addition, in another study examining posture and sports injuries in football players, it was reported that asymmetry in the shoulder and back may be related to back injuries, and abduction limitations in the scapula (Grabara, 2015). The development from childhood is very important to ensure healthy and standard posture development (Łubkowska, 2014). Due to the rapid growth, development and maturation in this period, the development and changes in posture are mostly observed in school-age children (Murphy, 2004). It has been demonstrated by scientific studies that it is possible to protect spine health with posture training to be done in adolescence. It has been observed that exercise is given importance for children during adolescence in developed countries (Feng, 2018; Kamali et al., 2016; Senthil, 2017; Yoo, 2013). In another study conducted with adolescents, it was reported that after 6 weeks of stretching and resistance exercises, the muscles in the head and thoracic region were strengthened, resulting in a reduction in head anterior tilt and protraction in the shoulder part (Ruivo et al., 2017). Some studies have been carried out in the literature on sports and health in individuals at different ages in fixed posture and mobile positions (Jackson et al., 2019; Mahdavie et al., 2017;Kılınç, 2021). One of the main purposes of postural analysis has been reported in studies emphasizing the importance of identifying postural disorders in individuals, providing physical follow-up, and treating postural disorders, starting from a young age. (Kılınç et al., 2009; Rosenblum et al., 2020; Protic-Gava et al., 2019; Lauenroth et al., 2021). In the study investigating the effects of combined training on performance in male football players aged 12–14 years, in the comparison of the first and final measurements of the combined training group, the initial pre-measurement averages of Heart Rate were determined as 102.4±16.9 beats/min, the Heart Rates of initial and final measurement averages of 102.46±13 beats/min. Beat Count at the end of the test pre-measurement averages 185.8±7.4 beats/min. Heart Rates at the end of the test mean measurements at 165.6±30.9 beats/min. as detected.

In the convectional (normal) training group, the initial pre-measurement mean of the Heart Rate was 106.8±11.9 beats/min, the mean of the initial (post-measurement) Heart Rate was 107.4±12.7 beats/min, and the mean of the pre-measurement of the Heart Rate at the end of the test was 180.6±21.9 beats/min., Heart Rate found the mean of the last measurement at the end of the test as 169.4±32.3 beats/min. They determined the pre-measurement mean of the normal training group as 14.9±0.5 beats/min and the final measurement averages as 7.6±0.5 beats/min (Karabulak, 2013). Işıldak (2013) A study conducted in male and female athletes aged 12-15 aimed to Decipher the effects of swimming training on heart function, and when resting heart rate was examined, it was reported that there was a statistically significant decrease in the number of initial heart rate, warming-up heart rate, maximal heart rate, post-training heart rate. When combined training programs are included in the training plan and scheduling more broadly; We think that it will be more effective in terms of providing versatile development in terms of physiological, biomotoric, technical and postural aspects. In a study carried out on Australian male individuals whose mean age was determined as 12.8 years during adolescence, he reported systolic blood pressure value as 113.3±10.9 mmHg and diastolic blood pressure value as 64.4± 8.6 mmHg (Gopinath et al., 2012:352).

In a study conducted on male individuals aged 12-18 years, he reported resting heart rate as 90.6 beats/min, systolic blood pressure as 116.6 mmHg, and diastolic blood pressure as 67.8 mmHg (Kwok et al., 2013). Waterhouse (2005) states that body temperature is one of the basic variables of body rhythm and many performance indicators follow body temperature values. Franchi et al. (2014) found in their study that after 10 weeks of training, an eccentric 44% 1RM increase and a concentric 36% 1RM increase occurred. However, in their studies on leg press, 5-8% muscle increase in the eccentric group in the distal part and 7-11% muscle increase in the medial region in the concentric group were reported. A similar increase occurred in the groups in the proximal part.Narici et al. (1996) reported

an increase in muscle volume of 8.5% after 6 months of strength training performed in leg extension. It is reported that the strength development that occurs with strength training occurs due to the increase in muscle hypertrophy and nerve activation (Mc Ardle et al., 2010). Negra et al. (2020), in a study investigating the effects of resistance training and plyometric training in young football players with a mean age of 12.8±0.2 years, the standing long jump pretest mean resistance training group was 1.66 ±0.19 meters, the plyometric training group was 1.61±0.23 meters, the control group was 1.58±0.13 meters., At the end of the 8th week, the measurements were determined as 1.78±0.19 meters in the resistance training group, 1.76±0.21 meters in the plyometric training group, and 1.57±0.08 meters in the control group.

Jukic et al. (2019), in his study to examine the motor skill levels of U10 category football players, the standing long jump average of the 1st team football players was 151.33 ± 10.55 cm. the average of the standing long jump of the 2nd team football players was 150.70 ± 11.71 cm. as detected In the research conducted on swimmers aged 11-13, it was reported that a statistically significant performance increase occurred in the push-up values of the swimmers at the end of the training (Selçuk, 2013). In the study conducted on 24 young football players with a mean age of 11.3±0.70 years, the mean of jumping rope in the right foot, pre-training experimental group was determined as 140.50 ±16.28, the mean of the control group was determined as 133.10 ± 12.99, the mean of jumping rope in the experimental group before the training was 139.08 ± 18.62, and the mean of the control group was 133.75 ± 11.94. After the training, the mean skipping rope of the right foot experimental group was determined as 144.44 ±17.36, and the average of the control group was 134.21 ±11.65, and the average of the left foot experimental group after the training was reported as 143.00 ±17.83, and the average of the control group was 134.67 ±12.15. Short-term jump rope training in 24 pre-adolescent young football players during an eight-week warm-up of 15 minutes. They examined the effects of jump rope training on balance performance and general motor coordination and revealed that jumping rope training caused a significant increase in balance performance and motor development of pre-adolescent children, as well as football-specific skills (Trecroci et al., 2015). They reported that there was a statistically significant difference in vertical jump data in child athletes aged 12-14 who were given movement training (Hoffman, 2006).

The vertical jump average of the 10-year-old subjects participating in the research they carried out on young football players aged 10-13; 36.1±5.9 cm., mean vertical jump of 11 year old subjects; 35.2±4.9 cm., vertical jump average of 12 year old subjects 40.1±6.2 cm, vertical jump average of 13 year old subjects 42.9±7.8 cm. (Canhadas et al., 2010). In a study investigating the effects of in-season plyometric training on young football players whose mean age was determined as 13.3±0.6 years, an increase of 2.11% and 3.72% was detected in the 5 meter and 10 meter durations, respectively, in the training applied to 14 male athletes for 8 weeks (Meylan and Malatesta, 2009). It has been reported that there are significant differences in the 20-30-40 meter sprint data at the end of the training performed 3 times a week in children aged 10-12 (Diallo et al., 2001). In addition, the FutTech test program, which we use to determine the technical skills of football players, has always been seen to be used practically in training, and it has been thought that it can be used in multi-dimensional development studies for trainers working in the infrastructure.

In the study examining the effect of combined training on football players aged 12-14, when the FutTech final measurement data were examined, the Heart Rate was at the beginning; Combined Training Group mean 102.4±13 beats/min, Normal Training Group average 107.4±12.7 beats/min, Heart Rate at the end of the test; Combined Training Group mean 165.6±30.9 beats/min, Normal Training Group average 169.4±32.3 beats/min, systolic blood pressure initial measurement; Combined Training Group mean 111.3±15.9 mmHg, Normal Training Group mean 114±11.2 mmHg, systolic blood pressure test end; Combined Training Group mean 124±18.4 mmHg, Normal Training Group average 124.6±18.8 mmHg, diastolic initial; Combined Training Group mean 74.6±8.3 mmHg, Normal Training Group mean 76±11.8 mmHg, end of diastolic blood pressure test; Combined Training Group mean 79±5.4 mmHg, Normal Training Group average 78.6±6.3 mmHg, body temperature at baseline; 36.5±0.3°C, Normal Training Group mean 36.1±0.7°C, body temperature test end;

Combined Training Group average 36.4±0.3°C, Normal Training Group average 36±0.6°C, ambient temperature; Combined Training Group average 7.7±0.4°C, Normal Training Group average 7.6±0.5°C, FutTech; Combined Training Group average is 38.5±2.3, Normal Training Group average is 43.6±3.5, test values; The average of the Combined Training Group was 48.4±10.6, and the average of the Normal Training Group was 31.6±9.2. When the football technique (FutTech) test data applied to the combined and convectional training athletes were examined, a statistically significant difference was reported only in the baseline FutTech and body temperature data ($p<0.05$), it was reported that no statistically significant difference was observed in the other test results. ($P>0.05$) (Karabulak, 2013).

It is necessary to emphasize the importance of school-family-club cooperation in order for young children to carry out their football training in a healthier way. Therefore, it can be suggested that combined training should be given more space in training planning in order to use the time allocated to football training more effectively and to provide versatile development. In terms of its wide content and application, if combined trainings are planned and carried out in accordance with the developmental characteristics of children and young people; It will enable children to develop their physical, physiological, biomotoric, technical and skill features in a more scientific way. In order to provide multi-faceted development to children and young people, detailed information about the importance of combined training can be provided, and gains can be achieved more effectively. In the study investigating the effect of basic technical training on motoric and technical ability development in football players aged 10-13 years, they reported that there was a significant difference between the pre-test and post-test in the data of bouncing, passing, dribbling, shooting and wall pass ($p<0.05$) (Kurban and Yalçınkaya, 2017).

Conflict of interest

Conflict of interest No conflict of interest is declared by the authors. In addition, no financial support was received.

Ethics Statement

For this study, the permission of the Faculty Ethics Committee was obtained from the Clinical Research Ethics Committee of Akdeniz University Faculty of Medicine. (Approvel Nummer: 2012-KAEK-20, Decision No:105. Date:10.02.2021 .

Author Contributions

Study Design, SD; Data Collection, AY; Statistical Analysis, SD; Data Interpretation, AY; Manuscript Preparation, SD, AY; Literature Search, SD, AY. The published version of the manuscript has been read and approved by all authors.

Statement of contributorship

All authors contributed to the development of the study methodology, data collection and analysis. All authors participated in writing, reviewing and editing the manuscript, and approved the final version.

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