Anthropologist, 19(1): 31-39 (2015)
PRINT: ISSN 0972-0073 ONLINE: ISSN 2456-6802
DOI: 10.31901/24566802.2015/19.01.04

Special Balance Developer Training Applications on Young Males' Static and Dynamic Balance Performance

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KEYWORDS Athletes. Centre of Pressure. Football. Exercise. Postural Control

ABSTRACT The propose of the present research was to determine the static and dynamic balance performance of eleven year old young males and examine the effect of special balance trainings on balance performance. The sample of the research included 75 young males - 25 athletes, 25 sedentary and 25 control groups. At the beginning of the study, a balance developer was applied to athletes and sedentary group for two months (8 weeks) after the results of pre-test balance measurements were taken. At the end of the special training program, the balance development level was determined by post-test application. Research findings showed that balance development in special training program provided developments for athletes and sedentary groups compared with control groups ($P<0.05$). Finally, it was thought that special balance education program can improve athletes' and sedentarys' balance capability by participating at sports clubs' substructure education and primary schools' physical education lesson curriculums.

INTRODUCTION

These days, sport is considered as an important part of healthy and balanced life and it is accepted as one of the most useful social activities. Exercises may be included into a training program as part of an injury prevention/management strategy or with the primary aim of improving athlete performances (Sannicandro et al. 2014). Especially, in childhood period sportive activities that are done regularly, play an important role for development and maintenance of a healthy physical structure. Doing exercise regularly plays an important role in the development of a child. So, each child should be in a specific physical activity to show healthy growth and development.

Competitive and recreational sports are dependent on multiple components of training and the development of strength, power, and endurance (Hickson 1980; Komi 1984; Häkkinen and Myllylä 1990). The performance of high-level motor tasks during sport learning and training or competition implied to master both static and dynamic balance simultaneously (Mesure et al. 1997; Perrot et al. 1998; Hugel et al. 1999).

Balance training (BT) is a relatively recent phenomenon in the fitness industry that has developed into a primary point of interest for consumers and fitness professionals (Yaggie and Campbell 2006). Balance is comprised of the dynamic reactions of involuntary sensations and impulses that maintain an upright stance and is necessary for most functional movements. Success in athletic and recreational activities depends on both balance and functional movements (Komi 1984; Frank and Earl 1990; Horak et al.1990). BT can be defined as a training regimen that aimed at an improved postural control (Distefano et al. 2009). Balance is a key component in both the maintenance of functional abilities and performance of high level physical activity (Geddam et al. 2014). Balance deteriorates with age and creates a risk factor for falls (Cecel et al. 2007).

Studies confirm that high-level sportsmen display improved balance control in relation with the requirements of each discipline (Perrin et al. 2002). So, learning a sport and training it over a long period of time appears to improve the efficiency of both static and dynamic postural control in daily life activities (Lavisse et al. 1995; Perrot et al. 1998; Hain et al. 1999; Hugel et al. 1999).

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Childhood is the phase of most beautiful times in the human life. Everything attracts to all children's interest in this period. One should allow the concept of motion to enter the child's world in this period. Balance is an important factor in the emergence of productivity and in the movement development. A fall may occur if the ability to maintain balance is not up to the mark, and inefficient balance strategies may also result in poor athletic performance (Azeem and Sharma 2014). Balance creates a basis for a good performance and is defined as a forwarder for muscle, nervous system. The ability of people's providing balance is an advancing factor for the development of other motor skills. Movements that require balance need the use of an exact combination of certain anatomical, muscular and neurological functions (Atilgan 2013).

It is known that balance has an important role protecting the body composition that is necessary for successful performance. For this reason, it created a basis for dynamic sports that include sudden changes in motion. All sports include a certain level of stability (Altay 2001). In addition, the most important non-environmental factors of falls are postural stability and lower extremity in the muscle strength. The control of Postural stability decreases with age and causes an increase in the frequency of falling (Tuzun et al. 2004). There are limited data on the influence of balance training on motor skills of elite athletes (Hrysomallis 2011). There are several studies that have evaluated the effects of balance training on static and dynamic balance abilities. It is, however, found that a limited number of studies of children and adolescents are associated with balance performance. Besides, guidelines concerning the optimal sequence and impact of balance exercises on postural control during BT are rare and lack of scientific validation. Thus, there is at this point no scientific evidence of an optimal exercise sequence to ensure progression in BT and the impact of such a sequence on balance performance (Muehlbauer et al. 2012). Moreover, it is unclear whether baseline balance ability changes due to sports participation and regular training without specific balance training such as the use of wobble boards (Hrysomallis 2007).

Purpose of the Study

The purposes of the present study have been two-fold: firstly, to determine the static and dynamic balance on eleven year old young males, secondly, to examine the impact of specific balance training on balance performance.

MATERIAL AND METHODS

The present study was conducted to determine static and dynamic performance of three sample groups (including eleven year old young males) as athletes, sedentary and control groups. Sample size was determined prospectively with reference to other studies that used similar end points. Sample size for each group was identified as 24 with a power of 0.95 and α= 0.05 using power and sample size procedure of MINITAB 13.0 V statistical software package. The possibility of the glitch for the studies research was started with per group 25 individuals. All the participants were chosen randomly. The special balance training program was not applied to the control group that consisted of 25 eleven year old males who were chosen randomly. The special balance training was applied to 25 athletes who played soccer at a club (*Atakum Belediyespor*) and to 25 individuals who were chosen as the sedentary group. All participants used their right foot as dominant foot.

Balance training was applied for 2 months (8 weeks) during the 40-minute program, which was performed 3 days per week. "BT work plan" was prepared for each application week.

Ethical Considerations

Before the study, the required ethics committee approval by *Ondokuz Mayis University* (2012/59) and written permission by the *Atakum Belediyespor* and the consents of the participants' parents were obtained. The aim of this study was explained to the patients during the data collection phase, and thus the "informed consent principle" was fulfilled.

Application

The measurements were held at *Ondokuz Mayis University*, *Yasar Dogu Faculty of Sports Sciences Sports Hall*. Before the balance training was started, pre-test measurements of all groups were taken. Balance trainings were held at the *Atakum Municipal Sports* facilities artificial turf. Athletes and sedentary groups participating recreational sports activity (football) in the study will continue their schedule of football trainings. In the present study, balance training programs were performed in three stages at least 40 minutes per day (1-warm up stage: five minutes; 2- main stage in which the athletes and sedentary groups used land ladder, jump ropes, balance ball (foam) and step training hoop, slalom pole, dame marker cones, funnel and barriers equipment for improving their balance ability: thirty minutes; 3-cooling down stage including jogging and stretching: five minutes), 3 days per week, for 8weeks. Regular trainings were conducted with the club coaches, while specific balance exercise practices were applied by the researchers. After the balance trainings were completed, post-test measurements were taken from the athletes, sedentary and control groups, immediately. During this time no studies were made with the control group. The control group continued their physical education classes in schools.

Balance Measurements

Balance is often measured by having subjects stand on a computerized force-platform. Centre of pressure (COP) motion is indicative of postural control and is measured from the ground reaction forces from a force platform. COP displacement is generally considered the gold standard measure of balance (Jallai et al. 2011). Balance, an intrinsic part of everyday's activity and of high importance in athletics, is a combination of both static and dynamic balance (Richendollar et al. 2006).

Static Balance Measurements

Static balance is the ability to sustain the body in static equilibrium (Goldie et al.1989). In other words, static balance is the ability to maintain a base of support with minimal movement (Winter et al.1990). Static test was performed with double leg stance on a fixed platform, eyes open and eyes closed position, the position of the right and left foot in one foot. In this 30 second- test protecting the position is requested and provided to the reagent to follow the position on the screen. Static balance measurements are Center of Pressure in the X-axis (*COPX*), Center of Pressure in the Y-axis (*COPY*), Forward-Backward Standard Deviation (*FBSD*), Medium Lateral Standard Deviation (*MLSD*), Average Forward-Backward Speed (mm/sec; *AFBS*), Average Medium-Lateral Speed (mm/sec; *AMLS*), *Perimeter* (mm), *Ellipse area* (mm^2). These measurements were taken four times (open eyes, closed eyes, right foot and left foot). The increase in static balance scores indicates deterioration in the balance of the individual.

Dynamic Stability Measurements

Dynamic balance ability is defined as the ability to transfer from a dynamic state to a static state or to maintain stability while performing dynamic motions (Distefano et al. 2009). Besides, dynamic balance may be considered as the ability to perform at task while maintaining or regaining a stable position (Goldie et al. 1989). Dynamic test was carried out with double foot posture position. Optimum position was determined like in the static test, feet wide apart as shoulder and feet posture open positions with reference to the lines on the x and y axis, so that it points equidistant from the point of the origin. Pressure level of stabilometer for this test are set according to the 5 (out of 50) degree of difficulty. Following the circular route on the platform, the test was completed by turning it clockwise 5 rounds within 60 seconds. If individuals did not complete the test in valid time, the performance of the individual so far was taken as a result of the test. Dynamic balance measurements are Stabile Index, Average Track Error (*ATE*), Average Force Variance (*AFV*), Trunk Total Standard Deviation (*Tru.Tot.Std.Dev*.), Trunk Bacward-Forward Standard Deviation (*Tru. B-F Std.Dev*.), Trunk Medium-Lateral Standard Deviation (*Tru.M-L Std.Dev*.), Delay. These measurements were taken one time (open eyes). The increase in dynamic balance scores indicated deterioration in the balance of the individual.

Statistical Analysis

The difference between pre-test and post-test values for the static and dynamic balance measurements taken from each group was analyzed by using paired t-test or Wilcoxon signed-rank test according to the results of Levene test and Shapiro Wilk test for equality of variances and the normality assumption, respectively. Further, the values among the groups (athletes, sedentary and control groups) were analyzed by using One-way ANOVA or Kruskal Wallis H test. Then, Tukey HSD or Dunn multiple comparison test was applied to determine any further differences among the groups. Significance was evaluated at $P < 0.05$ for all tests. All the computational work was performed by means of SPSS (SPSS 2002).

RESULTS

For three groups, the Shapiro-Wilk test gave values of P>0.05, confirming the normal distribution of the data for *OE COPX*, *OE FBSD*, *OE AFBS*, *OE ELLIPS AREA* (mm^2), *LF FBSD*, *LF AFBS*, *RF COPY*, *RF FBSD*, *RF AFBS*, *RF AMLS*, *RF PERIMETER (mm)* except for the examined other parameters.

Pre-test values for the static and dynamic balance measurements of this current study were not statistically different among athletes, sedentary and control groups except for eyes closed *COPY* (*P*=0.015), *FBSD* measured from left foot (*LF FBSD*) (*P*=0.003), *Trunk Total Std. Dev*. (*P*=0.032), *Trunk B-F Std. Dev*. (*P*=0.002), *Trunk M-L Std. Dev*. (*P*=0.030). These significant findings showed that the balance performance of the athletes and sedentary group were better than that of the control group.

The difference between pre-test and post-test values for the static balance measurements were statistically significant among athletes, sedentary and control groups whose eyes were open except for *OE COPY* (*P*=0.590) (Table 1), while all these difference values for the static balance measurements were not statistically different among athletes, sedentary and control groups whose eyes were closed (*P*>0.05).

Further, the *FBSD* measured from right foot (*RF FBSD*) (*P*=0.013), *LF FBSD* (*P*=0.009), *LF AFBS* (*P*=0.016) and *LF Ellips area* (*P*=0.017) measurements were statistically different among athletes, sedentary and control groups (Table 2).

These significant findings showed that the balance performance of the athletes and sedentary group was better than the control group.

The difference between pre-test and post-test values for some dynamic balance measurements were statistically significant among athletes, sedentary and control groups (Table 3), while the values for other dynamic balance measurements were not statistically different (*P*> 0.05).

There were no statistically significant differences between the pre-test and post-test results of all static and dynamic balance measurements taken from the athlete group with participants whose eyes were open and closed (*P*>0.05). There were statistically significant differences between the pre-test and post-test results for *COPY* (*P*=0.012), *FBSD* (*P*=0.021), *AFBS* (*P*=0.048), *AMLS* (*P*=0.020) and *Perimeter* (*P*=0.029) values taken from right foot and for *COPX* (*P*=0.007), *FBSD* (*P*=0.003), *AFBS* (*P*=0.005), *AMLS* (*P*=0.004), *Ellips area* (*P*=0.003) and *Perimeter* (*P*=0.007) values taken from left foot of the athlete's group (Table 4).

There were statistically significant differences between the pre-test and post-test results of the static balance measurements taken from the sedentary group whose eyes were open except for *OE COPX*, while all these parameters for the static balance measurements taken from the group whose eyes were closed were no statistically significant (*P*>0.05). Besides, there were

Table 1: The descriptive statistics for difference between pre-test and post-test values of the static balance measurements

Groups	*Athletes*	*Sedentary*	*Control*	*P*
n	25	25	25	
OE COPX				
Mean	0.24b	-0.32b	0.52a	0.043
Std.Dev.	1.94	2.38	1.13	
Min.	-3	-5	-2	
Max.	6	5	5	
OE FBSD				
Mean	-0.60b	-1.20b	0.20a	0.019
Std.Dev.	3.56	4.66	3.23	
Min.	-7	-13	-2	
Max.	6	6	5	
OE MLSD				
Mean	-0.88	-0.92	0.62	0.027
Median	-1 b	-1 b	1.5 a	
Min.	-7	-8	-4	
Max.	2	5	3	
OE AFBS				
Mean	-2.68b	-2.88b	1.64a	0.022
Std.Dev.	7.36	5.77	3.26	
Min.	-26	-15	-2	
Max.	5	5	7	
OE AMLS				
Mean	-1.88	-2.36	1.72	0.034
Median	-1b	-2b	2a	
Min.	-16	-24	-6	
Max.	4	12	13	
OE ELLIPS AREA (mm^2)				
Mean	-209.4b	-330.8b	100.04a	0.003
Std.Dev.	535.1	611.5	343.26	
Min.	-1335	-2597	-432	
Max.	615	594	673	
OE PERIMETER (mm)				
Mean	-111.1	-124.4	42.6	0.048
Median	-31 b	-113 b	63 a	
Min.	-722	-900	-264	

Table 2: The descriptive statistics for difference between pre-test and post-test values of the static balance measurements

Groups	Athletes	Sedentary	Control	P
Right Foot				
RF FBSD				
Mean	-2.08	-2.72	2.20	0.013
Median	-3 b	-1 b	1 a	
Min.	-11	-15	0	
Max.	9	13	24	
Left Foot				
LF FBSD				
Mean	-2.56b	-1.76b	-1.52a	0.009
Std. Dev.	3.87	3.48	2.56	
Min.	-9	-8	-3	
Max.	7	8	-11	
LF AFBS				
Mean	-11.48b	-11.80b	-5.84a	0.016
Std. Dev.	20.81	19.21	14.01	
Min.	-54	-56	-19	
Max.	48	25	13	
LF ELLIPS AREA mm^2				
Mean	-413	-512	-695	0.017
Median	-332 a	-376 a	-513 b	
Min.	-2246	-4309	-3529	
Max.	3191	1002	6102	

Table 3: The descriptive statistics for difference between pre-test and post-test values of the dynamic balance measurements

Groups	Athletes	Sedentary	Control	P
n	25	25	25	
ATE				
Mean	1.60b	2.84a	2.64a	0.013
Median	2	4	38	
Min.	-17	-38	23	
Max.	19	42	76	
Tru Tot Std Dev				
Mean	-0.70	-3.06	-0.84	0.029
Median	0.02a	-0.16b	-0.04a	
Min.	-33	-27	-24	
Max.	30.6	20.98	24.06	
Tru B-F Std Dev				
Mean	-0.79b	-7.98a	-3.48a	0.003
Median	0	-1.87	-0.70	
Min.	-30	-30	-30	
Max.	29.48	24.28	16.05	
Tru M-L Std Dev				
Mean	-1.22b	1.57a	0ab	0.009
Median	0	0	0	
Min.	-27	-30	0	
Max.	24.44	25.79	0	

statistically significant differences between the pre-test and post-test results for *FBSD*, *AFBS* and *Perimeter* values taken from right foot of the individuals in sedentary group except for *COPX* (P=0.590), *COPY* (P=0.069), *MLSD* (P=0.791), *AMLS* (P=0.106), *Ellips Area* (P=0.128). Moreover, there were statistically significant differences between the pre-test and post-test results for *FBSD*, *MLSD*, *AFBS*, *AMLS*, *Ellips Area* and *Perimeter* values taken from left

Table 4: The pre-test and post-test values for static balance measurements of the athletes

Parameters	Measurement time	Mean	Standard deviation	Median	P
Right Foot					
COPY	Pre-test	-4.68	5.09	-	0.012
	Post-test	-2.16	3.56	-	
FBSD	Pre-test	11.40	4.03	-	0.021
	Post-test	9.32	3.31	-	
AFBS	Pre-test	43.28	13.44	-	0.048
	Post-test	37.28	14.85	-	
AMLS	Pre-test	32.68	7.84	-	0.020
	Post-test	29.80	9.53	-	
PERIMETER (mm)	Pre-test	1781.16	461.28	-	0.029
	Post-test	1566.40	549.47	-	
Left Foot					
COPX	Pre-test	-6.20	-	-4	0.007
	Post-test	-1.76	-	-2	
FBSD	Pre-test	11.20	3.59	-	0.003
	Post-test	8.64	2.90	-	
AFBS	Pre-test	46.64	-	42	0.005
	Post-test	35.16	-	33	
AMLS	Pre-test	34.48	12.51	-	0.004
	Post-test	26.44	9.38	-	
ELLIPS AREA (mm^2)	Pre-test	1320.12	-	1193	0.003
	Post-test	907.08	-	821	
PERIMETER (mm)	Pre-test	1897.16	718.96	-	0.007
	Post-test	1445.88	560.84	-	

foot of the individuals in sedentary group except for *COPX* (*P*=0.666) and *COPY* (*P*=0.124) (Table 5).

There were no statistically significant differences between the pre-test and post-test results for dynamic balance measurements in sedentary group except for Trunk B-F Std. Dev. values (Table 6).

DISCUSSION

There is a strong evidence to suggest that balance training can improve static balance ability as well as dynamic balance ability on stable and unstable surfaces. Several studies have demonstrated large improvements in static balance time after subjects trained using a tilt board (Bringoux et al. 2000; Atilgan 2013) and that dynamic balance ability is improved after a balance training program (Perrin et al. 2002; Davlin 2004; Mêtel and Jasiak 2006; Ricotti 2011). Balance training programs performed at least 10 minutes per day, 3 days per week, for 4 weeks that incorporate various methods of balance training appear to improve balance ability (Distefano et al. 2009). In this study, balance training program was applied to athletes and sedentary groups as 40 minutes per day, 3 days per week, for 8 weeks by

Table 5: The pre-test and post-test values for static balance measurements of the sedentary group

Parameters	*Measurement time*	*Mean*	*Standard deviation*	*Median*	*P*
OE COPY	Pre-test	-1.04	-	-1	0.024
	Post-test	0.04	-	0	
OE FBSD	Pre-test	8.56	3.56	-	0.027
	Post-test	6.36	2.66	-	
OE MLSD	Pre-test	5.12	-	5	0.032
	Post-test	4.20	-	4	
OE AFBS	Pre-test	17.44	5.37	-	0.020
	Post-test	14.56	5.13	-	
OE AMLS	Pre-test	12.76	-	12	0.034
	Post-test	10.40	-	10	
OE ELLIPS AREA (mm^2)	Pre-test	831.56	-	759	0.006
	Post-test	500.76	-	446	
OE PERIMETER (mm)	Pre-test	733.80	-	715	0.017
	Post-test	609.36	-	612	
Right Foot					
FBSD	Pre-test	12.88	5.02	-	0.047
	Post-test	10.16	3.89	-	
AFBS	Pre-test	51.04	-	47	0.045
	Post-test	38.36	-	37	
PERIMETER (mm)	Pre-test	2070.36	-	1806	0.040
	Post-test	1608.08	-	1484	
Left Foot					
FBSD	Pre-test	11.36	2.58	-	0.018
	Post-test	9.60	3.06	-	
MLSD	Pre-test	7.36	-	6	0.033
	Post-test	5.72	-	6	
AFBS	Pre-test	47.64	-	42	0.005
	Post-test	35.84	-	35	
AMLS	Pre-test	36.68	-	34	0.005
	Post-test	28.48	-	27	
ELLIPS AREA (mm^2)	Pre-test	1546.96	-	1285	0.009
	Post-test	1033.04	-	905	
PERIMETER (mm)	Pre-test	1973.76	-	1761	0.001
	Post-test	1507.08	-	1467	

Table 6: Pre-test and post-test measurements of dynamic balance of the sedentary group

Parameters	*Measurement time*	*Mean*	*Median*	*P*
Trunk B-F Std Dev	Pre-test	12.90	10.30	0.025
	Post-test	4.91	1.60	

using land ladder training, jump ropes training, balance ball training and step training hoop, slalom pole, dame marker cones, funnel, barriers. The results of this present study showed that specific balance training provided positive contribution on balance performance of the individuals. Bringoux et al. (2000) stated that regular participation in physical activity has a positive impact on balance. More specifically, sport training enhances the ability to use somatosensory and otolithic information, which improves postural capabilities (Balogun et al. 1992). Azeem and Sharma (2014) stated that the major finding of their study was that static and dynamic stretching are equally effective as a method of warm up for male recreational football players. The second finding of the study was that dynamic stretching and static stretching both produced significant change in dynamic balance performance. Thus, the new studies comparing the stretching exercises with the specific balance training for improving balance performance should be designed.

At the beginning of the study, although, the athletes' performance was numerically better than the sedentary and control group, the pre-test results of static and dynamic measurements taken from the research groups (athletes, sedentary and control group) were not statistically different except for eyes closed *COPY*, eyes closed left foot, *Trunk Total Std. Dev.*, *Trunk B-F Std. Dev.* and *Trunk M-L Std. Dev.* Contrary to expectations, these findings showed that the balance performances of eleven year old young sportsmen were not better than the measurements of the individuals in control group. The possible factors affecting the result can be sport age (number of years in sport practice), sport branch and current physical fitness of the individual. Thus, the balance ability increases in parallel to the training experiences in sports (Emery et al. 2005). Obviously, the general level of physical condition varies from one person to another. It depended on personal characteristics but also the level of physical skills formed in the period of early development and maintained later (Holm et al. 2004).

The significant findings for all static balance measurements showed that the balance performance of the athletes and sedentary group was better than control group (Tables 1 and 2). But, no significant difference was found between the athletes and sedentary group in terms of this finding. Thereby, it can be said that efficacy of the specific balance training program on these two groups is similar, but, the significant findings for all dynamic balance measurements showed that the balance performance of the athletes was generally better than sedentary and control group (Table 3). Similar conclusions were reported in the studies focused on different sports branches (Kovacs et al. 2004; Myer et al. 2006). These studies found that, with eyes open, both judoists and dancers showed better static and dynamic stance than a control group not involved in any sport activity.

It was also determined that the specific balance training program developed only *ATE*, *Tru. Tot. Std. Dev.*, *Tru. B-F Std. Dev*. and *Tru. M-L Std. Dev*. values measured from the athletes in contrary to sedentary groups. Thus, it can be said that the specific balance training programme is efficient on static balance development rather than dynamic balance development.

In terms of differences between the pre-test and post-test results for both static and dynamic balance measurements, when analyzed within each group; it was seen that the specific balance training programme was not efficient on all static and dynamic balance measurements taken from the athlete group except for some measurements taken from both right foot and left foot. The improvements for the static balance measurements (the pre-test and post-test results for *FSBD*, *AFBS*, *AMLS* and *Perimeter*) taken from left foot were better than right foot (Table 4). It is known that the balance performance for dominant foot of the athletes is better than other foot because of its widespread and intensive usage in training and competitions. According to the results of the study, it can be said that the specific balance training program was more efficient on left foot rather than right foot.

Due to the fact that specific balance training was applied with the eyes open, the findings for the static balance measurements taken from the individuals with eyes open in the sedentary group were significant, although, the findings taken from the individuals with eyes closed was not significant (Table 5). Thus, this indirectly demonstrated that the application of specific balance training while with eyes closed or open stimulate different proprioceptive canals. Further, it was determined that the specific balance training program improved only *FBSD*, *AFBS* and *Perimeter* values taken from right foot while this programme improved *FBSD*, *MLSD*, *AFBS*, *AMLS*, *Ellips Area* and *Perimeter* values taken from left foot of the individuals in sedentary. So, it can be said that the specific balance training program was more efficient on left foot rather than right foot (dominant foot) in terms of the static balance measurements including *MLSD*, *AMLS* and *Ellips Area* values (Table 5). It was also determined that the specific balance training program developed only *Trunk B-F Std. Dev* values in dynamic balance measurements of the sedentary group (Table 6).

Pau et al. (2014) stated that somewhat surprisingly, balance is not included among the most important features in athletic success; this quality is considered important mostly as a cofactor that helps reduce the risk of injuries. Therefore, it is said that the specific balance training improves balance performance of individuals, while these balance exercises reduce the risk of injuries of athletes.

CONCLUSION

The present research presented that the specific balance training program is efficient on static balance development rather than dynamic balance development of eleven year old young males. All these findings leaded to the starting point, related to the importance of training children by taking into account specific age-related balance training sessions, to induce effective changes in both sensory and motor systems influencing present and future balance performances. If an athlete does not have good balance, he cannot perform at their highest level. Practically, the benefits of balance training may provide an enhanced sense of control to the client or user.

RECOMMENDATIONS

Without doubt, postural stability is basic not only in daily-life situations but also in almost all sports. Thus, especially, balance researches with children and young people should be increased. In every moment of the life, the training program applied in this study may be useful for coaches and physical education teachers. Additionally, determining the performance of balance can be used as a router factor for selecting branch of people who have recently started doing sport.

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