



THE COMPARISON BETWEEN STATIC AND DYNAMIC BALANCE PERFORMANCES OF TEAM AND INDIVIDUAL ATHLETES

Çağrı Çelenk¹, Hayati Arslan¹,
Zait Burak Aktuğ²ⁱ, Emre Şimşek¹

¹Erciyes University,
School of Physical Education and Sports,
Kayseri, Turkey

²Niğde Ömer Halisdemir University,
School of Physical Education and Sports,
Niğde, Turkey

Abstract:

The balance in the formation of high performance and the display of skill in all sports branches has an important place. The aim of the study is to compare the static and dynamic balance performances of individual athletes with team athletes. A total of 55 athletes, 29 team athletes and 26 individual athletes, currently licensed to perform sports, participated in the study. Static and dynamic balance performances of the athletes were determined by the Biodex isokinetic balance system. The Mann-Whitney U test was used to determine the difference between the static and dynamic balance performances of individual athletes and team athletes after analyzing through the SPSS software program. As a result of statistical analysis, there was no significant difference between static and dynamic balance performances of team athletes and individual athletes ($p < 0.05$). As a result, improved fitness performance is required for effective use of motor skills in all sports branches and high performance. But according to the sports branch, the need for equilibrium is different. For this reason, it can be said that it is more important to assess the balance performance between the branches in terms of the need, rather than to evaluate the balance performance as a team and individual sportsman.

Keywords: team athletes, individual athletes, static balance, dynamic balance

1. Introduction

Balance can be simply defined as a general term describing the dynamics which prevent body mass from falling to the ground (Sucan et al., 2005) or the body's support base and the center of gravity (Arnold and Schmitz, 1998). Balance consists of the coordination of

ⁱ Correspondence: email zaitburak@gmail.com

several muscles in the body and the integration of sensory information. Balance is examined in two ways as static and dynamic balance. Static Balance is defined as the ability to sustain the various positions created by the adjustment of the contour line and the support surface width (Hockey, 1981), while the dynamic Balance is defined as the neutralization of external forces acting on the body by the muscles and soft tissues around the joints (Brown and Weir, 2001). Dynamic balance plays an important role in the provision of a number of daily activities such as standing and walking, but it is also an essential element for exhibiting skill in complex movements and improving sport performance. The balance control is dynamic when the person is in motion. Thus, dynamic balance has a more complex mechanism than static balance (Bakırhan, 2009). Balance is related to age, sport age, gender, anthropometric structure, support points, activity level, muscle tone, muscle strength and fatigue level (Çelenk et al., 2015; İbiş et al., 2015; İbiş, 2017; Ünlüsoy et al., 2011; Blaszczyk et al., 2009; Howe et al., 2011; Leung et al., 2011; Iri et al., 2016; Mahmood et al., 2017; Yılmaz et al., 2016; Yılmaz et al., 2017).

It is necessary to maintain balance and body position in order for a movement to continue. Balance is required in sports activities as well as in daily life (Murphy et al., 2003). Balance has an important place in the exhibition of performances and in the formation of high performance (Yazıcı, 2012). The balance is a decisive factor in making movements such as sudden change of direction, holding, throwing, pushing, stopping, starting from the basic movements in sports (Can, 2007; Altay 2001). In situations such as not being able to protect the balance or maintaining the body position, the athlete cannot demonstrate the expected performance and faces the danger of injury (Börüklü, 2008). Studies have shown that dynamic balance and postural control are essential for success in all performance sports (Cote et al., 2005; Erkmén et al., 2007).

Although there are several studies on the balance performance of athletes, a great majority of these studies have been performed in order to determine the state of balance performance in the sport branch or compare the balance with other parameters. This information is the comparison of the static and dynamic balance performances of the athletes who perform team sports and the athletes who perform individual sports.

2. Material and Method

A total of 55 athletes, 29 of whom are team athletes and 26 are individual athletes, are currently licensed to perform sports participated in the current study. Four of the team athletes are licensed in soccer, 4 in basketball, 5 in handball, 9 in volleyball while 4 of them are tennis, 6 are skiing, 4 are boxing, 4 are taekwondo and 8 are licensed in wrestling.

2.1. Isokinetic Balance Measurement

Balance measurements of the athletes participating in the study were measured by means of the Biodex isokinetic balance system (Biodex, Inc., Shirley, New York). The Biodex balance system consisted of a play platform that allows the athlete to stand still,

as well as moving back and forth and sideways, and a touch and electronic home screen that was adjusted to the exact heading of the athletes. The personal information of the athletes, the type of test to be done and the test results were made on the electronic main screen. At the beginning of the test, there was a point on the main screen that represents the person performing the test. The aim was to keep this point in the center of the house on the main screen. The general balance index score was used while working out the data obtained from the test result. The higher the general equilibrium index score was, the greater the loss of balance was. Balance scores of "0 degrees" represented the best balance. The platform had a degree of mobility between 1-12. Level 12 was the most stable platform, while level 1 was the most mobile platform. In the study, the tests were performed with one leg, standing flat position and eyes open. To determine the balance performance in the study, the static balance and the 1st and 6th levels of dynamic balance tests were applied separately on both legs. The balance test was made for 3 seconds with a duration of 30 seconds and a rest interval of 15 seconds and the best value was taken into operation.

2.2. Statistical Analysis

The Mann-Whitney U test was used to determine the difference between static and dynamic balance performances of the athletes performing the team sports and the athletes performing the individual sports after the obtained data were analyzed through SPSS 24 package program. Significance level was accepted as $p < 0.05$.

3. Findings

Table 1: Descriptive characteristics of the athletes

	Team Athletes	Individual Athletes
	Mean±Sd	Mean±Sd
Age (year)	21.55±2.27	22.27±1.93
Height (cm)	175.79±7.17	177.85±5.25
Body Weight (kg)	73.14±10	72.10±11.86
BMI (kg/m ²)	23.8±3.71	23±2.93
Sport Age (year)	10.31±3.68	11±4.56

Table 2: Comparison of balance performances of individual athletes with team athletes

		Mean±Sd	p
		Static Balance	Team Sports
	Individual Sports	.36±.27	
Dynamic Balance 1	Team Sports	5.38±2.97	.302
	Individual Sports	5.08±3.94	
Dynamic Balance 6	Team Sports	1.44±.6	.821
	Individual Sports	1.65±.78	

$p < 0.05$

Table 2 shows that there is no statistically significant difference between static and dynamic balance (1st and 6th level) performances between team athletes and individual ones. ($p < 0.05$).

4. Discussion

It is stated that balance performance is important in exhibiting sportive skill in the studies conducted, and balance can be used as a determinant factor in performance classification among the athletes (Erkmen, 2006). There was no significant difference between the performance of the team athletes and the dynamic and static balance performances of the individual athletes. At the difficult level of the dynamic balance (level 1), there was a decrease in the balance performance of the athletes. When the literature was examined, balance performance was compared among the branches, but no comparison was found between team sports and individual sports athletes.

Perin et al. (1998) reported that judo had a better balance than dancers when there was no significant difference between the control group and the values of the judges in the study of the static balance test performance of the judo, dance and control groups. Perrin et al. concluded that high-level athletes exhibited balance control in relation to the needs of each sport branch. In a similar study, gymnastics was compared with football and handball players and control group. He noted that the balance performances of single-foot, double-foot and foam surfaces as a single foot between groups were similar (Vuilema and Nougier, 2004). In another study, Davlin (2004) compared the dynamic balance performances of elite female and male gymnasts, swimmers, soccer players and control groups and found that gymnasts had better values than athletes in other branches; in addition, soccer players and swimmers had better balance values than the control group. Bressel (2007) assessed the dynamic and static balances of university athletes playing soccer, basketball and gymnastics, and found that basketball players had lower dynamic balance scores while gymnasts and soccer players had no difference in their values. In a study conducted by Erkmen et al. (2007), the balance performances of gymnasts was compared with soccer players and basketball players and found that the gymnasts had better balance performances than basketball players in all balance performances and the static balance performances of the gymnasts and soccer players were similar to each other and the dynamic balance performance was in favor of the gymnasts. In addition, Erkmen et al reported that the balance performances of basketball players and footballers were similar.

The needs for balance performance of both individual and team sports vary. While some sport branches require a highly improved balance performance for maximum efficiency, balance in some sports branches may not be the first priority for higher efficiency. For this reason, the need for balance is different depending on the sports branch (Börüklü, 2008). As a result, it can be stated that it is more important to evaluate the balance performance between the branches in accordance with the needs rather than to evaluate the balance performance as team and individual athletes.

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