Turkish Journal of Sport and Exercise /
Türk Spor ve Egzersiz Dergisi
http://dergipark.gov.tr/tsed
Year: 2021 - Volume: 23 - Issue: 3 - Pages: 302-305
DOI: 10.15314/tsed.1010699

Turkish Journal of Sport and Exercise
Türk Spor ve Egzersiz Dergisi
ISSN: 2147-5652
https://dergipark.org.tr/tr/pub/tsed

Comparison Of Balance Performances Of Athletes From Different Sports Branches

Ali TATLICI[1A]

[1]*Selcuk University, Faculty of Sport Science, Konya, Turkey*
Address Correspondence to A. Tatlıcı: e-mail: alitatlici@selcuk.edu.tr

(Received): 16/10/2021/ (Accepted): 30.12.2021

A:Orcid ID: 0000-0001-6346-0010

Abstract

This study aimed to investigate the comparison of the dynamic balance performances of basketball and football players. Ten male basketball players (age 17,60±0,69 years, height 1,90±0,04 cm, body weight 87.80±9.19 kg) and ten male football players (age 17,50±0,97 years, height 1,78±0,04 cm, body weight 74,50±12,04 kg) voluntarily participated in the study. Both groups's athletes continue to train actively in their sports clubs. Biodex Balance System (BBS, Biodex Medical Systems Inc., Shirley, NY) was used to test dynamic balance, and three index scores were recorded as an overall stability index (OSI), an anterior-posterior stability index (APSI), and a medial-lateral stability index (MLSI). Mann Whitney U Test, non-parametric tests, was used to compare both groups and the significance level was set at $p < 0.05$. Results. There were no significant differences between groups in terms of OSI and APSI but MLSI was significantly different in favor of the football group ($p<0.05$). It can be concluded that football players can exhibit better dynamic balance than basketball players.

Keywords: Balance, Football, Basketball, Dynamic.

INTRODUCTION

The ability to balance is defined as keeping the whole body in balance and maintaining the situation during and after the body's displacement (7). It is known that the balance skill, which forms the basis of performance and is at the center of conditioning skills, plays an important role in the successful display of many sports skills, in changing direction, stopping, starting, holding, moving the object, and maintaining a certain position of the body (2). The ability to balance is defined as keeping the whole body in balance and maintaining the situation during and after the body's displacement The human ability to maintain balance can be defined as a determining factor in the development of other motor systems (8).

Balance control is a complex motor skill that includes the integration of sensory inputs as well as the planning and implementation of flexible movement patterns (9). The integration of

information from the sensor systems provides information about the person's orientation in order to maintain posture control in the space that allows for regulatory reflexive movements (5). However, sensory inputs are not solely responsible for maintaining postural control. Postural stability depends on the integrity of the muscle mass, the efficiency of the systems within the central nervous system, and the complete neural pathways for motor control (10). Static and dynamic balance or postural stability is defined as the ability to control the body's center of gravity on the base of support (Woollacott et al., 1986)(17). Dynamic balance can be thought of as providing or maintaining balance in some movements or on unstable surfaces (11).

Sportive exercises challenge the body's postural control systems specific to the branch and improve postural adaptations in order to complete sportive movements effectively (14). Studies indicate that the improved balance in experienced athletes may be a result of repetitive exercises that affect motor responses or may result from training experiences (3). Balance performance plays a great role in sports branches and especially dynamic, is one of the most important motor skills (13). There are not enough studies comparing the dynamic equivalent of sports branches that require different skills (according to the author's knowledge). In this study, it was aimed to determine and compare the dynamic balance levels of two different sports branches with different structural features.

MATERIAL AND METHOD

Subjects

Twenty male athletes who were still actively doing sports and who agreed to participate in the study voluntarily participated in the study. The research group was selected from 10 basketball (age 17,60±0,69 years, height 1,90±0,04 cm, body weight 87.80±9.19 kg) and 10 football athletes (age 17,50±0,97 years, height 1,78±0,04 cm, body weight 74,50±12,04 kg). Participants were informed about the aim and the risks of the study. All participants were provided with written informed consent. The study was approved by the local ethics committee (Protocol number 70, 19.10.2020, Ethics Committee of Selcuk University, Faculty of Sports Science, Konya, Turkey).

Experimental Design

Participants were taken to the sports science faculty laboratory at 10.00 am. Participants were warned not to participate in any exercise in the past 48 hours until the end of the test section. Subjects were applied to standard warm-up including stretching movements. Following that, participants' dynamic balances were taken by Biodex Balance System (BBS, Biodex Medical Systems Inc., Shirley, NY).

Dynamic Balance Testing

The participant's dynamic balances were measured with open eyes. Two tests were performed on each participant to get used to the measurement instrument before the measurement. Then dynamic balance measurement was made for the dominant leg. Subjects were subjected to a balance test on one foot by holding their hands on the shoulders of the crossed position after standing on the BBS's mobile platform. The level of difficulty of the measuring instrument was set to "Level 4" for the OE condition. The other leg did not touch the ground and participants were not allowed to look at the BSS monitor. The test duration was 20 seconds and the participants were asked to keep their balance as much as possible during the test. 3 separate balance scores were obtained after the automatically completed test [Overall Stability Index (OSI), Anterior-Posterior Index (APSI), Medio-Lateral Index (MLSI)]. Higher balance scores mean worse balance performance (15).

Statistical Analysis

The Shapiro-Wilk test is used to check a data set for normality to make parametric tests applicable. Balance performance data from the dynamic balance measurement were analyzed with the Mann Whitney U Test (basketball vs. football). All statistical tests were performed using the software package SPSS version 24.0 (SPSS Inc., Chicago, IL, USA). An alpha value of <0.05 was considered to be statistically significant.

RESULTS

Table.1. Comparison of Basketball and Football Player's Dynamic Balance Performance

Parameters	Groups	Mean	Std. Deviation	P value
Age	Basketball	17,60	0,69	0,46
	Football	17,50	0,97	
Height (m)	Basketball	1,90	0,04	***0,00**
	Football	1,78	0,04	
Body weight (kg)	Basketball	87,80	9,19	***0,01**
	Football	74,50	12,04	
OSI (score)	Basketball	3,98	0,65	0,08
	Football	3,27	1,51	
APSI (score)	Basketball	2,82	0,54	0,21
	Football	2,49	1,24	
MLSI (score)	Basketball	2,11	0,48	***0,00**
	Football	1,47	0,44	

OSI= Overall Stability Index; APSI= Anterior–Posterior Stability Index; MLSI= medial–lateral stability index. * Significant differences ($P < 0.05$).

When table 2 is examined, it is seen that the basketball group is statistically significantly higher in terms of height and body weight but not in age. While the OSI and APSI values did not differ significantly between the two groups, the football group was found to be significantly better in MLSI. Although there is no statistically significant difference, the values of the football group seem to be better in numerical APSI and OSI values.

DISCUSSION

Dynamic balance is among the factors limiting performance in some branches, and rapid adjustment of sport-specific balance is expressed as an important skill. Dynamic balance is defined as the ability to maintain or regain position on an unstable surface (16). In branches such as football and basketball, the type of branch-specific muscle activity is effective on balance performance (18). Therefore, in this study, it was aimed to determine and compare the dynamic balance levels of two different sports branches with different structural features. As a result of the study, while there was no significant difference between the groups in OSI and APSI balance parameters, a significant difference was found in favor of the football group in the MLSI parameter.

According to Akgöl (1), Berger et al.; It has been stated that the human body can be likened to an inverted pendulum and because the body's center of gravity can be lowered into the support surface, therefore, the balance of short individuals is more difficult to maintain. In addition, Akgöl (1) stated that taller athletes had better balance performance in his study. In this study, it was found that although the height of the basketball group was statistically higher, their balance performance was more unsuccessful than the football group. These results of the study contradict with Akgöl (1). On the other hand, Erkmen et al. (8) stated in their study that as the height increases, the dominant and nondominant static balance scores increase, that is, the short athletes are more successful in maintaining their balance. These results are similar to the results of Era et al. (6). In addition, it was determined that as the bodyweight increased, the static balance scores also increased, and the increase in body weight affected the balance performance negatively. In this study, it was found that the body weights of the basketball group were statistically higher than the football players. This information supports our study results.

Kariyawasam et al. (12) compared the balance parameters of basketball and football players in their study and stated that the balance performance of basketball players was better than football players in their study. While the balance parameter used in the study of Kariyawasam et al. (12) was static balance, it was the dynamic balance parameter used in this study, and the difference is thought to be due to this. Bressel et al. (4) compared the dynamic balance performance of basketball players and football players in their study and it was found that the dynamic balance performance of the football players was statistically higher. It has been emphasized that the test is closer to football because the elements such as passing and shooting are frequently performed on one foot in the nature of the football game, and the dynamic balance performance of the football players was, therefore, could be better than the basketball players. However, no direct evidence supports this claim (4). Similarly, in the presented study, football players showed better dynamic balance performance than basketball players.

CONCLUSION

It can conclude that basketball players displayed inferior dynamic balance to soccer players.

REFERENCES.

1. Akgöl A. Değişik yaş gruplarında dengenin değerlendirilmesi. Hacettepe Üniversitesi Sağlık Bilimleri Enstitüsü Bilim Uzmanlığı Tezi, Ankara, 1997.
2. Altay F. Ritmik jimnastikte iki farklı hızda yapılan chaine rotasyon sonrasında yan denge hareketinin biyomekanik analizi. Hacettepe Üniversitesi Sağlık Bilimleri Enstitüsü Doktora Tezi. Ankara. 2001
3. Bahar A, ÇETİN E, YARIM İ. Kadın sporcularda denge yeteneği ve denge antrenmanları. Gaziantep Üniversitesi Spor Bilimleri Dergisi. 2017; 2: 66-79.
4. Bressel E, Yonker JC, Kras J, Heath EM. 2007. Comparison of static and dynamic balance in female collegiate soccer, basketball, and gymnastics athletes. Journal of athletic training. 2007; 42- 42.
5. Cobb SVG. Measurement of postural stability before and after immersion in a virtual environment. Applied ergonomics. 1999; 30, 47-57.
6. Era P, Schroll M, Ytting H, Gause-Nilsson I, Heikkinen E, Steen B. Postural balance and its sensory-motor correlates in 75-year-old men and women: a cross-national comparative study. The Journals of Gerontology Series A: Biological Sciences and Medical Sciences. 1996; 51, M53-M63.
7. Erdoğan CS, Fatmanur E, İpekoğlu G, Çolakoğlu T, Zorba E, Çolakoğlu FF. Farkli Denge Egzersizlerinin Voleybolcularda Statik Ve Dinamik Denge Performansi Üzerine Etkileri. Spor Ve Performans Araştırmaları Dergisi. 2017; 8, 11-18.
8. Erkmen N, Suveren S, Göktepe AS, Yazicioğlu K.. Farkli branşlardaki sporcularin denge performanslarinin karşilaştirilmasi. Spormetre Beden Eğitimi ve Spor Bilimleri Dergisi. 2007; 5: 115-122.
9. Ferdjallah M, Harris GF, Smith P, Wertsch JJ. Analysis of postural control synergies during quiet standing in healthy children and children with cerebral palsy. Clinical Biomechanics. 2002;17: 203-210.
10. Horak FB, Shupert CL, Mirka A. Components of postural dyscontrol in the elderly: a review. Neurobiology of aging. 1989; 10, 727-738.
11. Hrysomallis C. Balance ability and athletic performance. Sports medicine. 2011; 41: 221-232.
12. Kariyawasam A, Ariyasinghe A, Rajaratnam A, Subasinghe P. Comparative study on skill and health related physical fitness characteristics between national basketball and football players in Sri Lanka. BMC research notes. 2019; 12: 1-5.
13. Maszczyk A, Gołaś A, Pietraszewski P, Kowalczyk M, Cięszczyk P, Kochanowicz A, Smółka W, Zając A. Neurofeedback for the enhancement of dynamic balance of judokas. Biology of sport. 2018; 35, 99.
14. Perrin P, Deviterne D, Hugel F, Perrot C.. Judo, better than dance, develops sensorimotor adaptabilities involved in balance control. Gait & posture. 2002; 15: 187-194.
15. Tatlici A, Unlu G, Cakmakci E, Cakmakci O. Investigation of the relationship between strength and dynamic balance performance in elite wrestlers. Ido Movement for Culture. Journal of Martial Arts Anthropology. 2021; 21: 18-22.
16. Winter DA, Patla AE, Frank JS. Assessment of balance control in humans. Med prog technol. 1990; 16: 31-51.
17. Woollacott MH, Shumway-Cook A, Nashner LM. Aging and posture control: changes in sensory organization and muscular coordination. The International Journal of Aging and Human Development. 1986; 23: 97-114.
18. Zemková E. Sport-specific balance. Sports Medicine. 2014; 44: 579-590.