

A Study on Static Balance Performance of Healthy and Hearing - Impaired Football Players

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Abstract: This study has been conducted with the view of studying balance performances of sedentary people with hearing impairment (SHI), hearing impaired football players (HIFP) and healthy football players (HFP) of the same age group. 17 SHI at the age of 18.29±1.53 on average, 15 HIFP at the age of 18.13±2.26 on average and 18 HFP at the age of 18.16±1.54 on average have participated in the study. The static balance performances of the participants have been measured with the flamingo balance test. The number of tries needed in order to stand on the balance beam for one minute has been recorded as the test result. The SPSS program has been used in analyzing the data. ANOVA has been applied in identification of the differences among the groups and the value 0.05 has been recognized as significant. No significant difference in terms of age, height and body weight on average has been observed among the groups ($p>0,05$). The values regarding the balance performance have been identified as 6,29±2,08 for SHI, 4,80±2,21 for HIFP and 3,88±1,23 for HFP. The balance performance difference among the groups have been found to be statistically significant ($p<0,01$). Consequently, the static balance performance of hearing-impaired football players is better than sedentary people with hearing impairment which demonstrates that regular participation in the sports has a positive effect on static balance performance. It was thought that this skill develops based on participation in the sports.

Key words: Hearing-Impaired % Sedentary % Football Player % Balance

INTRODUCTION

The disability is the situation of failure in adapting to the normal life as a result of losing physical, psychological, emotional and social skills at different levels due to congenital problems or other diseases or accidents [1]. Nowadays, facilitating the participation of people who have congenital problems or physical, emotional, psychological, cognitive, hearing or visual disorders due to diseases or accidents or people with multiple disabilities who have more than one of these, in sport activities is one of the subjects that is attached great importance in our country. However, training programs targeting the improvement of individual performances of the disabled sportsmen must be in line with their medical conditions [2]. Selecting correct training methods is the most important criteria in improving the sports performance in every sports activity. In sports, the sportsmen need to perform at a high level in terms of

physical and motor features to be successful. One of the parameters ensuring this success is the balance performance.

The balance is the skill that finds solution for the loss of balance resulting from a change in the center of gravity of the body. The balance has two categories static and dynamic. The static balance is the skill that enable the body balance to stand at a certain place or position, while dynamic balance is the skill that balances the body during its movement [3, 4].

The balance is an important factor of physical fitness in sports performance and daily life [5]. The balance is the skill that enables the body to stay in the intended position during movement. Holding the body in upright position is a main point in order to perform the necessary movements in well developed motor activities [6]. People's skill to balance is an important factor in the development of other motor systems and having a body composition needed for successful sports performance. It has been claimed that

high level sportsmen demonstrate a balance control in line with the requirements of the sports discipline [7]. Elite sportsmen dominantly use absolute sensory information in order to form their posture in line with the requirements of their sports discipline [8, 9]. For example, somatosensorial signs are more informative than autolythic signs for experienced gymnasts [10]. While seeing is an important factor in posture forming for professional dancers [11]. Evaluation of postural sway has many potential applications in sports medicine (categorization of the skilled sportsmen, biomechanical studies, prevention of sportsmen injuries and monitoring of the treatment). It is claimed that selection methods may be used for highly skilled sportsmen having the stable posture required by the sports such as gymnastics or basketball and biomechanical studies may be used in aiming sports such as archery [12].

This study has been conducted with the view of studying balance performances of sedentary people with hearing impairment (SHI), hearing impaired football players (HIFP) and healthy football players (HFP) of the same age group.

MATERIALS AND THE METHODS

A number of 17 sedentary people with hearing impairment (SHI), 15 hearing impaired football players (HIFP) and 18 healthy football players (HFP) of the same age group and with similar physical features have participated in the study on a voluntary basis. Height, body weight and balance performances of the participants have been measured. The identification of the ages of the participants was performed based on ID information. The measurement of the height: bare foot, head in upright position, head on frankfort platform, measurement scale at the vertex of the head, following a deep inspiration, the distance between sole and vertex of the head has been measured using Rodi Super Quality brand ruler and with 1 mm precision and has been recorded in cm terms. The measurement of the body weight; the body weights of the sportsmen have been measured with Premier brand electronic weighting machine and with the error margin of 100 gr, during measurement their standard sports clothes have been on (t-shirt and shorts) and the measurements have been recorded in kg terms. Body Mass Index (BMI) has been calculated with body weight and height measurements of the participants, with the formula of $BMI = \text{body weight (kg)} / \text{height (m}^2\text{)}$.

The balance performances have been measured with Flamingo Balance Test (FBT). The sportsmen get on a wooden balance equipment that is 50 cm in length, 4 cm in height and 3 cm in width and stand in balance. They bend one of their legs from the knee and pull it in and hold it with the hand on the same side. The time begins when the experimental group is in balance on a single foot like this and they try to stay in balance for one minute. When they lose balance, the time is stopped. When the experimental group is back in balance on a single foot on the balance equipment, the time resumes. The test goes on like this for one minute. When the time is up, the group's number of tries for balancing (after they lose balance) is counted and this number is recorded as the points of the experimental group at the end of this test when one minute is up [13].

For data analysis, SPSS has been used. The results of the measurements have been presented as medium and Standard deviation. If the data are normally distributed or not has been tested with the Shapiro Wilk test and normal distribution of the data has been identified. Since the data demonstrated normal distribution, one way analysis of variance (Tukey, a post hoc test) has been applied in identification of the differences between SHI, HIFP and HFP and 0.05 has been recognized as statistically significant.

RESULTS

When Tables 1 and 2 are reviewed and sedentary people with hearing impairment, hearing impaired football players and healthy football players are compared, it has been found out that there is no significant difference in the values of age, height, body weight and body mass index ($p > 0,05$), while the difference among balance values of the groups is significant in support of healthy football players ($p < 0,05$).

DISCUSSION

In this study conducted with the view of studying the balance performances of sedentary people with hearing impairment, hearing impaired football players and healthy football players in the same age group, it has been found out that there is no significant difference in the values of age, height, body weight and body mass index, while the difference among balance values of the groups is significant in support of healthy football players.

Table 1: Physical measurement values of sedentary people with hearing impairment, hearing impaired football players and healthy football players

Variables	Group	n	Mean \pm SD	F	P
Age (year)	SHI	17	18,29 \pm 1,53 ^a	0,037	0,963
	HIFP	15	18,13 \pm 2,26 ^a		
	HFP	18	18,16 \pm 1,54 ^a		
Height (cm)	SHI	17	172,05 \pm 6,92 ^a	0,027	0,974
	HIFP	15	172,00 \pm 6,62 ^a		
	HFP	18	171,50 \pm 9,45 ^a		
Body weight (kg)	SHI	17	72,70 \pm 9,89 ^a	0,528	0,593
	HIFP	15	68,86 \pm 8,56 ^a		
	HFP	18	71,05 \pm 12,47 ^a		
BMI (kg/m ²)	SHI	17	25,59 \pm ,00 ^a	0,739	0,483
	HIFP	15	23,22 \pm ,00 ^a		
	HFP	18	24,14 \pm ,00 ^a		

^{a,b}The difference is significant among the groups that have different letters in the same column (p<0.05)

Table 2: Balance measurement values of sedentary people with hearing impairment, hearing impaired football players and healthy football players

Ariables	Group	n	Mean \pm SD	F	P
Static Balance	SHI	17	6,29 \pm 2,08 ^b	7,360	0,002
	HIFP	15	4,80 \pm 2,21 ^{a,b}		
	HFP	18	3,88 \pm 1,23 ^a		

^{a,b} The difference is significant among the groups that have different letters in the same column (p<0.05)

When these findings are compared with the studies conducted in this field, some similarities and differences have been found. In their study, Cigerci *et al.* [14] have compared some of the physiological and motoric features of subjects with and without hearing impairment and at the end of the study they stated that hearing impairment has negative effects on some motor features. Sirinkan [15] has studied on the effects of educational sports games on physical development of hearing impaired students and in conclusion, it has been pointed out that educational games have contributed to the physical features of hearing impaired students in a positive way. In the study on mentally disabled children, Gencoz [16] has stated that regular training or sports activities have effects on some behavioral changes and motor developments of mentally disabled children. In the study on people without visual impairment in various age groups, Akın applied flamingo balance test on puberty period sedentary people and football players and found statistical significant difference. In this study, the reason why the difference is not significant is thought to be due to “zeroing” (The subject receives zero point for trying 15 times in the first 30 minutes) in flamingo balance test [17]. Şahan [18] has studied on the effect of physical education and sports activities of 16 children with slight mental incompetence

who receives special education on their neurotic problem levels and as a conclusion, has stated that physical education and sports activities serve for social, emotional, physical, mental and movement general development of the children. When literature is considered, regular physical activities contribute to the physical, physiological, psychological, sociological and motoric development of the children. As a result, it demonstrates that regular physical activity has effects on healthy people and people with hearing impairment as well. When sporting habits of the cases are considered, especially in timed balance tests, the significant difference in support of hearing impaired people who exercise in both of the groups demonstrate that sports activities has contributions to the development of physical performances and balancing skills of the hearing impaired children. In many studies of the literature, it is possible to see that sports habits improve the ability of vestibular coordination structures to work in harmony with each other. In that sense, the results of our study are in line with the literature [19-21].

In conclusion, static balance performance of hearing impaired football players has been better than that of hearing impaired sedentary people and this demonstrates that regular participation in the sports has a positive effect on the static balance performance. The difference between hearing impaired football players and healthy football players has been in favor of healthy football players and it is thought that the reason for this is their being healthy. Nevertheless, many repetitive similar studies are needed.

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