Investigation of Balance and Coordination Skills of Sedanter and Active Individuals

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Abstract: In this study, it is aimed to investigate the balance and coordination skills of sedentary and non-sedentary individuals. A total of 85 volunteer males, with a mean age of 20 ± 2.50 years, a mean height of 177.87 ± 5.82 cm, and a sedentary population of 22.04 ± 3.18 kg / height, and 53 of whom were physically active three days a week, participated in the study. The coordination skill with Technobody ProKin PK 200 was measured by the Harre Coordination test for balance test measurement. SPSS (24.0) statistical package program was used to analyze the data. In the comparison between groups using Mann Whitney U test from non-parametric tests significance level was determined as $p<0,05$. The mean duration of coordination time of physically active individuals was 34.66 sec, the average of equilibrium performances was 51.63 cm, and the sedentaries were 51.63 sec and 54.97 cm, respectively. A statistically significant difference was found between the active and sedentary groups in terms of balance ($p<0,00$) and coordination ($p<0,00$). As a result, it was found that the balance and coordination performances of the active individuals were better than the sedentary individuals.
Keywords: Balance, Coordination, Sedentary.

INTRODUCTION

Physical activity is defined as activities that are performed by using our muscles and joints in daily life, resulting in energy consumption, increasing heart and respiratory rate and resulting in fatigue at different intensities [1, 2]. Although the benefits and importance of physical activity have been proven in many studies, health problems due to inactivity are increasing every year. Lack of physical activity can lead to a decline in motor skills, such as balance and coordination, which can lead to falls and injuries, especially in older ages. The first important balance forms in human life are sitting and standing. Rotation, bending, reaching up, standing on one foot, are other forms of balance that emerge parallel to the development of the child. Balance is a very important factor for the body in gaining skills such as walking, running and jumping [3]. Balance holds an important place among the basic features of sport. Plays an important role in playing, sports, dance and gymnastics.

Body balance must be good so that the person's daily life activities can be accomplished successfully and independently. In terms of sports knowledge; For the intended movement, interactions between the central nervous system and the skeletal muscle system are necessary. The balance in our body shows changes with age. These changes are beginning to increase in the pre-school age (3-6/7 years) and peak at youth (17-18 for girls, 18-19 for boys) and decrease with age [4]. The development and protection of motor skills is important for the athletes as well as for the sedentaries in order to make their daily work / activities healthy and efficient. Balance and coordination between motor skills we use in daily life has an important place. Balance is adaptation to body position against gravity in case of movement or rest. When moving, moving, holding an object, moving, moving and moving an object, the balance plays important roles [5]. Coordination is defined as the functioning of the skeletal muscles and the central nervous system in harmony [6]. These two basic features will not be completely separated from each other, should be developed in order to be successful in sports, to make daily activities easier and to decrease the possibility of falling and injury [7-9].

Based on this information in our research; The aim of this study was to compare the balance and coordination characteristics of sedentary and non-sedentary men.

MATERIALS AND METHODS
Participants

The average age of this study; With a mean of 20 ± 2.50 years, a mean height of $177,87 \pm 5,82$ cm, and a physically inactive figure of 22.04 ± 3.18 kg/height2 with an average BMI of 22.04 ± 3.18 a total of 85 volunteer men participated in the study. People who do not walk, run or physically get tired during daily life are defined as sedentary people [25, 26]. Non-sedentary people were selected from people who exercise regularly for 3 days on average week.

Procedure
Body Composition

Body mass index of the participants was performed by the TANITA BC-418MA Segmental Body Analyze Monitor (Japan) device. During the measurement, the bare feet and the feet were pressed to the foot pads and hand grips were squeezed gently. Participants were informed that they should not consume alcohol the day before the measurement, not eat heavy food 2 hours before the measurement and comply with normal sleep periods. They were also warned to remove metal objects at the time of measurement.

Balance Test

The balance performances were determined by the Technobody ProKin PK 200 instrument with a 30 second static balance test. The introduction of the instrument was made to the participants a week ago and they were allowed to experiment. The participants were asked to place their feet on the instrument evenly after the balance tool was calibrated. They were allowed to hold their balance in front of the support. When he felt ready, he removed his hand from the support handle and a balance test was started. Directing the balance tool using its feet for 30 sec; and was asked to try to stop at the closest point in the red circle he had seen on the screen.

Coordination Test

Coordination test developed by Harre and used frequently in scientific studies (figure 1). Participants were allowed to perform 3 trials in 5 minutes. The mean duration of the trial was calculated and the coordination time of the person was calculated. If the error is made during the test (touching, dropping the obstacle) the participant was given a 2-minute break and the test was repeated from the start [10]. After general warming, the participants were allowed to start the test when they felt ready. After the participants roll over, they turn to the right side around the obstacle at the center point and pass under and above the first obstacle. They then pass over and over the second obstacle around the obstacle at the center point. They turn right over and above the third obstacle around the center obstacle. The participant passing the last obstacle also gets out of the exit door by turning right around the obstacle standing in the center point [11-14].

- Participants complete the course as quickly as possible by following the arrows from the starting point.
- It shows the distances between test components.

STATİSTİCAL ANALYSİS

Mann Whitney U test was used for comparison of active group and sedentary group. SPSS 24.0 statistical package program was used for statistical analysis and the significance was determined as $p<0,05$.

RESULTS

The average of coordination time of physically active individuals is 34.66 sec the average of equilibrium performances was 51.63 cm and the sedentaries were 51.63 sec and 54.97 cm, respectively. It was found that there was a statistically significant difference between both active and non-active subjects in terms of balance ($p<0,00$) and coordination ($p<0,00$). The balance and coordination performances of the active participants are better than the sedentary individuals (Table 1).

Table-1: Comparison of Coordination and Balance Performance of Sedentary and Active Participants

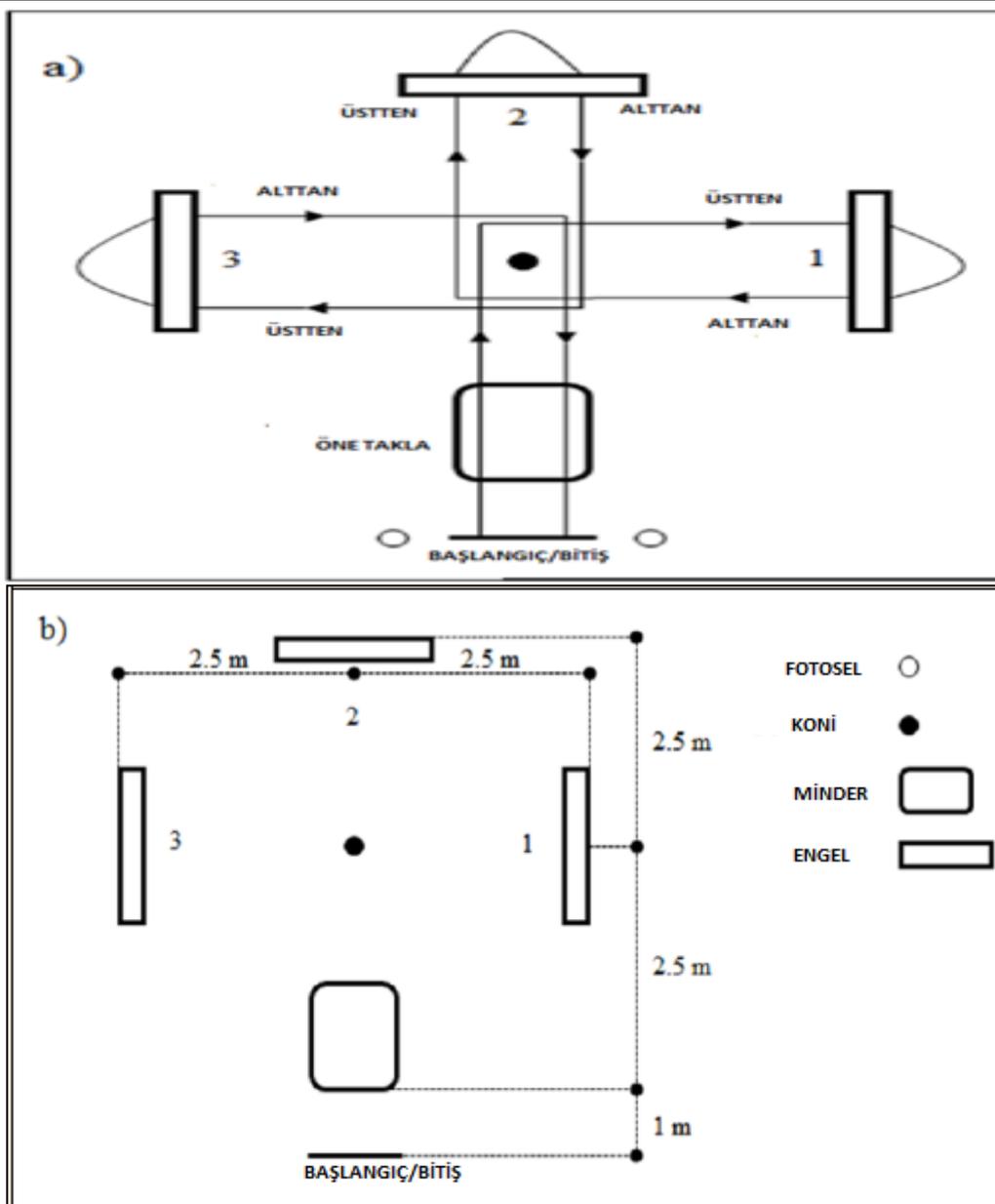| Variable	Exercise status	N	Sıra Ort.	Z	p
Coordination	Active	53	36,55	-2,740	,006*
	Sedentary	32	51,63		
Balance	Active	53	34,66	-3,687	,000*
	Sedentary	32	54,97		

*p<0,05

Fig-1: Harre Coordination Test

CONCLUSION AND DISCUSSION

The aim of this study was to compare the balance and coordination performances between physically active and sedentary young men. As a result of the study, it was found that the balance and coordination skills of the active individuals were better than sedentaries. The effect of physical activity on motoric characteristics in all age groups has been shown in many studies. When the studies done on the youth were examined, they found that both the motoric and physiological characteristics of the exercise children were affected positively [15]. In another study, it has been shown that movement training, which includes sportive activities implemented in the context of play and physical activities, positively affects psychomotor development in children in the first stage of primary education [16]. In people with aging or degenerative diseases, cognitive decline, postural disorders, decreased muscle strength, balance disorders and disabilities due to falls increase [17]. Many elderly and sick people are limiting their daily activities against the risk of falling from the balance disorder [18]. However, it is known that these negative situations can be avoided and better quality can be experienced with the exercises[19]. When the literature is examined, it is seen that different studies have been done examining the effects of exercises on the elderly. The application of virtual reality at home; showed that exercise could be an alternative way to improve the reduced physical function [20]. Seco *et al*. [21] found that physical activities (9 months) developed balance skills in the elderly. In addition, the effects of exercise on cognitive functions were also investigated in some studies. Kwok *et al*. [19] found that 8-week low-intensity coordination

training increases cognitive functions in the elderly. Niemann *et al*. [22], that cardiovascular activities and coordination studies reduce constriction in the hippocampal regions of the brains; they have even demonstrated growth in this region. In our daily life, we need balance to protect from accidents or to be able to do our jobs efficiently [23]. Since balance is the key to mobility, it is important in every age. The balance decreases with age and creates a risk factor for falls [24]. As a result, we can say that the balance and coordination skills of the physically active individuals are better than the sedentaries.

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