



AEROBIC DANCE OR STEP DANCE: WHICH EXERCISE CAN INCREASE BALANCE, FLEXIBILITY AND MUSCLE STRENGTH OF UNIVERSITY STUDENTS?

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Abstract: The aim of this study was to compare effects of aerobic dance and Step- dance exercises on balance, flexibility and muscle strength in University Students. Volunteer university students were divided three groups as aerobic-dance (N=20, 14 men and 6 women), step dance (N=20, 12 men and 8 women) and control groups (N=15). All groups expected control group were participated 2 times a week an hour aerobic or step dance exercise session during 3 months. Wilcoxon Sign test was used to analyze pretest and posttest results of variables. As a result, although there were significant differences in weight, body fat percentage, balance, flexibility and leg strength of step-dance group, there were only significant differences dynamic balance and flexibility variables of aerobic-dance group ($p \leq 0.05$). Moreover, there were no significant differences in control group variables. The data of this study indicates that weight loss program with a step dance and aerobic dance are as useful tools as the other sports which enable to decrease body fat percentage, in improving weight for university students

Key Words: Step Dance, Aerobic Dance, Flexibility, Balance, Strength

AEROBİK DANS VEYA STEP DANS: ÜNİVERSİTE ÖĞRENCİLERİNDE HANGİ EGZERSİZ DENGE, ESNEKLİK VE KAS KUVVETİNİ ARTIRIR?

Özet: Bu çalışmanın amacı Üniversite öğrencilerinde, Aerobik ve Step dans egzersizlerinin denge, esneklik, kas kuvveti üzerine olan etkilerini karşılaştırmaktır. Gönüllü üniversite öğrencileri Aerobik dans (S=20, 14 erkek ve 6 kadın), Step dans (S=20, 14 erkek ve 6 kadın) ve Kontrol (S=15) olmak üzere 3 gruba ayrılmıştır. Kontrol grubu hariç, diğer gruplar, 3 ay boyunca haftada 2 kez, 1 saat olmak üzere aerobic dans veya step dans egzersiz programına katılmıştır. Değişkenlerin ön ve son test arasındaki analiz için Wilcoxon Sign testi kullanılmıştır. Sonuç olarak; Step dans grubunda vücut ağırlığı, vücut yağ yüzdesi, denge, esneklik, bacak kuvvetinde anlamlı farklılıklara rastlanırken, Aerobik dans grubunda ise sadece denge ve esneklik değişkenlerinde anlamlı farklılıklar görülmüştür. Kontrol grubunda ise değişkenlerde anlamlı farklılıklara rastlanılmamıştır. Step dans ve aerobic dans ile kilo düşmenin, vücut kompozisyonunu geliştirmeye, vücut yağ yüzdesini azaltma bakımından diğer sporlar gibi faydalı araçlar olarak görüldüğü bildirilmiştir.

Anahtar Kelimeler: Step Dans, Aerobik Dans, Esneklik, Denge, Kuvvet

INTRODUCTION

Regular exercise is beneficial in preventing and managing hypertension, obesity, and diabetes mellitus in older females and males. These benefits can be attained with moderate exercise, such as a daily walk of 30 min and a 20-min strength training regimen 2 days a week (Tuncel, 1996).

Physical activity helps maintain muscles that burn energy, helps maintain body weight within the proper guidelines and represents a basic means of stress control. Of course, activity helps us look better, makes us more vital and decreases our sense of exhaustion (Mavrić et al., 2014). Dance; containing different skills (cognitive, functional, motor, musical), large muscle groups are used extensively, accepted in aerobic level, is a specific type of exercise (Kostić et al., 1999). Dance is a type of physical activity usually recommended for protecting dexterity, muscle tone, and coordination (Sofianidis et al., 2009).

Aerobic dance forms a group of exercise accompanied music of a certain tempo, rhythm and dynamics. It is used to improve cardiovascular fitness. It includes in various dance steps, skips, jumps, turns and movements which are performed in all directions and on various plains and are used in accordance with the shape and abilities of the person exercising (Raju, 2014). Aerobic step exercise is aerobic training methods which have a great role in improvement of aerobic fitness, physical health, cardiovascular fitness and body composition profiles (Ossanloo et al., 2012). Step dance and aerobic dance is a very

similar form of dance. The difference between them step bench. Step dance performs with a step bench. The studies which compare the effects of step dance and aerobic dance on physical and physiological parameters are limited in literature. Our aim is to compare and find out the effects of these similar dance forms on body weight, body fat percentage, flexibility, dynamic balance and muscle strength in university students

METHODS

A total of 55 volunteer university students aged 18-22 years participated in this study. They were divided three groups as aerobic-dance (N=20, 14 men and 6 women), step dance (N=20, 12 men and 8 women) and control groups (N=15). Subjects in the aerobic or step dance exercise groups participated in a 12-week exercise program held 2 days per week. Each exercise session lasted ~60 min and was led by a certified instructor (Aerobic or step dance exercise group).

Weight (kg) was measured to the nearest 0.1 kg on an electronic scale (Seca Corp, Birmingham, United Kingdom).

Dynamic balance was assessed using a Lafayette Instruments Stabilometer (model number 16030-Lafayette, IN). Each subject was given one trial to understand how the apparatus worked and to experiment with foot and body position. From that point, each subject was given a 30 s trial with rest periods between each trial. The best score of the three trials was recorded (Babayigit, 2014).



Body Composition (Body Fat Percentage)

The Bioelectrical impedance (Tanita TBF-401A, Tokyo, Japon) measurements were made adhering to the manufacturer's guidelines. The measurements were performed with the subjects stepping onto the measuring platform without shoes and after wiping the soles of their feet. Measurements were taken at a similar time point each day after an over-

night fast and limited physical exertion in an attempt to reduce measurement error. From weight, height, age, sex and bioelectrical impedance, BF was calculated from a built-in equation of the analyzer. The amount of BF is expressed as a percentage of total weight. The analyzer produces a printout with data of the BF after every measurement (Prins et al., 2008).

Variables)	Control Group			
	Pre-test X±SD	Post-test X±SD	Z	P
Weight(kg)	60.9±9.4	60.3±9.1	-0.084	0.68
Body Fat Percentage	17.8±5.09	18.1±5.19	-0.077	0.47
Dynamic Balance	11.8±2.8	12.3±3.1	-0.73	0.75
Flexibility	34.8±7.7	33.5±2	-0.69	0.92
Muscle Strength				
Hand Grip Strength (Right Hand)	32.5±8.6	31.9±8.1	-0.60	0.98
Hand Grip Strength (Left Hand)	31.8±10.1	30.6±9.6	-0.68	0.49
Leg Strength	79.3±13.6	80.6±14.5	-0.30	0.73

Leg Strength was measured using a leg and back dynamometer (Takei Model 5402, Japan). Participants were tested in a single trial. During the assessment participants were asked to exert maximum force with their legs and back to pull the chain of the dynamometer upwards (Telles et al., 2014).

Flexibility was measured with the sit and reach test (SAR) using the procedures of the Eurofit directive. Subjects sat on the floor with knees extended and feet placed at 90

degrees against a box. Testing was performed without shoes. The edge of the box was 15cm behind the zero point for measurement such that if the fingertips were in line with the box edge, a flexibility score of 15cm was assigned. The participants were asked to reach forward slowly and extend forward as far as possible, in a smooth stretching movement. Scores were measured to the nearest 0.5cm. The best of three trials was recorded (Haugen et al., 2014)

Handgrip strength (HGR) was assessed using a handgrip dynamometer (Lafayette Instruments Hand Dynamometer) to be squeezed as forcefully as possible with the preferred arm fully extended slightly away slightly away from the body, and palm facing inward. The higher the score the better the handgrip strength (Vancampfort et al., 2012)

Statistical Analysis

All data were analyzed using the statistical software program SPSS, version 16.0 (SPSS, Chi- cago, IL, USA). Descriptive statistics (means and standard deviations) were calculated. Wilcoxon tests were used to calculate differences between pre- and post-intervention

scores for each group, with a level of $p < 0.05$ considered statistically significant

RESULTS

Table 1: Control Group Variables And Wilcoxon Sign Test Results

No significant differences were found in the pre- and post-intervention scores for weight ($z = -0.84$, $p = 0.68$), body fat percentage ($z = -0.77$, $p = 0.47$), balance ($z = -0.73$, $p = 0.75$), flexibility ($z = -0.69$, $p = 0.92$), Right hand grip strength ($z = -0.60$, $p = 0.98$), Leg strength ($z = -0.30$, $p = 0.73$) in the Control group. Improvements were also observed in the control group, but only the improvement in Left hand grip strength ($z = -0.68$, $p = 0.49$) was statistically significant ($p < 0.05$).

Table 2: Aerobic Dance Group Variables And Wilcoxon Sign Test Results

Variables	Aerobic dance group			
	Pre-test X±SD	Post-test X±SD	Z	p
Weight(kg)	63.9±10.2	62.3±8.9	-0.97	0.33
Body Fat Percentage	16.8±5.09	16.1±5.19	-1.06	0.28
Dynamic Balance	10.8±4.8	16.3±3.3	-3.73	0.00*
Flexibility	38.85±8.7	33.85±8.2	-2.02	0.04*
Muscle Strength				
Hand Grip Strength (Right Hand)	29.65±9.6	29.90±10.6	-0.06	0.94
Hand Grip Strength (Left Hand)	32.8±10.1	32.6±10.6	-0.68	0.49
Leg Strength	70.3±13.6	73.6±14.5	-1.30	0.56

$p < 0.05$

Statistically significant differences were found in the pre- and post-intervention scores

for body fat percentage ($z = -1.06$, $p = 0.28$), balance ($z = -3.73$, $p = 0.00$), flexibility ($z = -2.02$, $p = 0.04$), Left hand grip strength ($z = -0.68$, $p = 0.49$) in the Aerobic group

**Table 3: Step Dance Group Variables And Wilcoxon Sign Test Results**

Variables	Step- Dance group			
	Pre-test	Post-test	Z	p
	X±SD	X±SD		
Weight(kg)	58.7±7.0	57.5±6.9	-3.71	0.00*
Body Fat Percentage	18.8±4.8	15.4±5.0	-3.44	0.00*
Dynamic Balance	10.4±3.4	14.9±3.7	-4.00	0.00*
Flexibility	33.4±9.1	37.6±9.7	-2.56	0.01*
Muscle Strength				
Hand Grip Strength (Right Hand)	30.8±8.7	30.4±9.2	-0.88	0.37
Hand Grip Strength (Left Hand)	27.7±8.0	27.9±8.9	-0.67	0.50

p<0.05

Statistically significant differences were found in the pre- and post-intervention scores for weight ($z=-3.71$, $p=0.00$), body fat percentage ($z=-3.44$, $p=0.00$), balance ($z=-4.00$, $p=0.00$), flexibility ($z=-2.56$, $p=0.01$), Right hand grip strength ($z=-0.88$, $p=0.37$), Leg strength ($z=-2.67$, $p=0.03$) in the Step -dance group ($p<0.05$)

DISCUSSION

This study was found significant differences ($p<0.05$) in weight, body fat percentage, balance, flexibility, left hand grip strength scores in the Aerobic group after a 12-week Aerobic dance training program for individuals aged 18-22, whereas individuals who participated in a step-dance program showed improvements in weight, body fat percentage, flexibility, balance, right hand grip strength, leg strength in the Step -dance group. The dif-

ferences between groups can be attributed to the type of exercise performed.

Aerobic dance do within a target heart rate of between 60% and 70% of the maximal heart rate has showed cardiovascular and metabolic advantages like increased maximal oxygen consumption, developed aerobic endurance capacity and increased energy production via the mitochondrial respiration system (Savitha and Anbalagam, 2014). The beneficial effects of Aerobic dance and Step dance exercise training have been emphasized on body mass, body mass index and body fat percent, flexibility, leg strength (Shimamoto et al., 1998; Tepkaew, 2002; Biçer et al., 2009; Akdur et al., 2007; Arslan, 2011; Nikić et al., 2012, Milenković, 2013; Najafnia et al., 2013), Some studies reported that no statistically significant changes were found in

body composition after step aerobics training (Drobnik-Kozakiewicz et al., 2013).

In study conducted by Maurya and Mahajan (2014) investigated the effect of an sixth week aerobic dance exercise program on body composition parameters. Experimental group participated in a aerobic dance exercise program for one hour per day for six week. They showed that significant difference was found in the subjects weight, waist circumference, hip circumference, biceps circumference, thigh circumference and BMI level after six week of the Aerobic dance exercise program. Savitha et al. (2014) found that aerobic dance training group is better than the hatha yoga training group and control group in cardio respiratory endurance whereas hatha yoga training group is better than the aerobic dance training group and control group in flexibility performance. In a study by Ljubojević et al. (2014) was to determine the effects of zumba fitness program on changes of women body composition in 12 women aged 25-35 years after eight weeks of exercise, total of 24 training sessions. They reported that statistically significant improvement in total body weight loss, fat percentage and fat free were found after 8 weeks zumba fitness program.

Berger et al. (2013) examined effects of a dance-based exercise program called “The Dancing Heart Program” on balance and quality of life in community-dwelling older adults. Ten subjects over age 60 were recruited in the study. Participants attended 60-minute sessions once a week for 13 session. They found that Dancing Heart Program had no signifi-

cant effect on balance at the end of the study. Drobnik-Kozakiewicz et al. (2013) evaluated the influence of step aerobics training on isometric strength of young female students. After ten weeks of Step aerobics training, Significant changes were observed in isometric strength of elbow flexors but no changes in isometric strength of knee extensors. There was compensation in isometric strength noted between left and right leg after ten weeks of training, where left leg was weaker than the right leg before training.

Granacher et al. (2012) investigated the effects of salsa dancing on measures of static/dynamic postural control and leg extensor power in seniors. They showed that Salsa proved to be a safe and feasible exercise programme for older adults accompanied with a high adherence rate. Age-related deficits in measures of static and particularly dynamic postural control can be mitigated by salsa dancing in older adults. Sofianidis et al. (2009) investigated the effect of a 10-wk traditional Greek dance program on static and dynamic balance indices in healthy elderly adults. Twenty older adults were randomly assigned to either an intervention group who took supervised Greek traditional dance classes for 10 wk (1 hr, 2 sessions/week, n = 14), or a control group (n = 12). They suggested that the use of traditional dance as an effective means of physical activity for improving static and dynamic balance control in the elderly.

CONCLUSION

Significant increases were seen in flexibility, balance and hand grip strength whereas dec-



reases were found in body fat percentage in both step dance and aerobic dance groups after 3 months exercises program. Besides these parameters, significant differences were found in leg strength performance in the Step-dance group only. The differences can be attributed to perform exercises on step bench because when subjects step up and down on a bench, leg muscles especially, quadriceps, hamstring and calf work more compared to aerobic dance which is performed exercises on surface so the difference between groups may be explained like this. The data of this study indicates that weight loss program with a step dance and aerobic dance are as useful tools as the other sports which enable to decrease body fat percentage, in improving body composition for university students. In further studies, the impact of step dance or aerobic dance on other variables that affect performance or for increasing quality of life or to improve health status can be analyzed comprehensively.

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