

The effect of eight-week cyclic exercises and Pilates exercises in women to some physical parameters and blood lipids

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Abstract

This research is conducted to examine the impact of Pilates and circuit exercise to some physical features and blood-fat. 22 women, ages ranging from 22 to 55 years, voluntarily participated into the study. The participants were requested to do 30 minutes long Pilates and circuit exercise three days per week for 8 weeks. Physical measurements and blood-value were taken in the beginning of the research and in the end of 8th week. For this purpose, body weight, body-mass index, fat-rate, chest, waistline, belly, hip size, heart rate, blood pressure, flexibility, flamingo balance test, and Harvard step test measurement of participants were made. HDL and LDL levels of the participants were determined by using the blood testing device in laboratory. Mann Whitney U test was applied in the comparison of the before and after results of exercise program. Body weight, resting pulse, BMI, chest, abdomen, hip and basal circumference, a significant decrease in the values and a significant increase in the flexibility values, body weight, chest, waist, abdomen, hip circumference, and the value of balance test, a significant decrease was found and the flexibility values significantly increased of cyclic exercise group. As a result, both exercise programs had a similar effect on some selected parameters on sedentary women.

Keywords: Blood parameters, circuit exercise, Pilates, physical feature.

INTRODUCTION

Health is a state of complete physical, mental or social well-being and not merely the absence of disease or infirmity. Physical health includes body size and shape, sensory acuity, susceptibility to illness and discomfort, body function, healing ability, and ability to perform certain tasks. One aspect of the physical health, the musculoskeletal consisting of three components; Muscular strength, endurance and flexibility (15). Another aspect is cardiovascular durability and fitness.

The main and essential aim of exercise for health; to prevent or slow down morphologic and physical disorders caused by a sedentary lifestyle, to increase physiological capacity based on body health and to maintain physical fitness and health for many years. In developed countries, one third of those over 16 years of age healthy and happy, to live, to remove top physical level, but also to make the physical structure of strong reasons as to seem

thin and delicate, believes in the need for regular exercise (28). To accomplish this aims, people take different types of exercises. American College of Sport Medicine (ACSM), Centers for Disease Control and Prevention (CDC), suggests that people must participate to exercise and physical activity for at least 30 minutes each day (21). Alves et al. (3) emphasized that the importance of physical activity in the primary and secondary prevention of cardiovascular diseases. At the same time, they are suggested that physical activity and regular exercise can improve cardiovascular health and reduce disease rate (3).

Pilates is a popular exercise method for decades, dance training and medical community. Pilates Method is unique approach to mind training, in body awareness and the control of movement and posture. Specialized devices give variety of training opportunities (23). The purpose of Pilates exercises is to strengthen the abdomen and back regions equally and create a solid skeleton

on the upper part of the body contrary to classical resistance exercises Pilates is strengthened whole muscle structure (12).

Cyclic training is a great way to simultaneously develop mobility, strength and endurance. Moreover it is one of the best exercises to achieve excellent gains fitness, muscle tone, strength and weight reduction. Briefly, it is a kind of exercise that can get maximum results in the shortest time (17). There was a lot of study that put forward to positive effect of cycle training (9,16,19). Kingwell (16) suggested that after cycling training, elevating shear stress in contribute to endothelial adaptation and the cardiovascular protective effects. In a study, Abe (2) reported low-intensity that cycle training can elicit concurrent improvement in muscle hypertrophy and aerobic capacity.

While usually in adolescence in men, sports and exercise main subject is gain strength and to be successful in sports, the women struggle to aims health, a lean body and look beautiful body. Middle-aged women are usually participating to exercises due to increased risk of disease or deterioration of physical appearance. Exercise can include not only an anabolic response by the muscular system but also improvements in cardiovascular fitness (1). Thus preventing and slowing the diseases caused by an immobile life are important purposes of exercise.

The purpose of this study was the investigated effect of cyclic training and Pilates exercises on women's physical properties that related to physical fitness and changes in blood fat, body mass index, resting pulse, blood pressure balance and flexibility.

MATERIALS & METHOD

Participant

Participants in this study were selected from range of 25 and 55 years 22 women participated in the study voluntarily that was sedentary life style. Written informed consent was obtained after the explained purpose and method of study participants signed that be willing to participate the study. Participants were randomly divided into two groups as Pilates and cyclical exercise groups. 2 women have remained off study for various reasons.

Exercise program

The Pilates group performed basic pilates exercises for 30 minutes three days a week. Immediately before and after exercise of heating and stretching exercises have been done 5 minutes. The cyclical group performed of cyclic exercises that low-moderate intensity exercises determined according to age and health condition for every individual for 30 minutes. Every stage of training was performed in the presence of coach. The study lasted eight weeks. First measurements were done on the first day, and last measurements on the following day when the eight-week exercises were completed.

Data Collection

Participants' height and weight were measured as shoeless and shorts. Wall-fixed metal meters were used for length measurement. Weight and body fat was measured using the Tanita-305 body-fat analyzer (Tanita Corp., Tokyo, Japan) Bioelectrical impedance from foot to foot. Chest, waist, hip, thigh circumference was measured with a tape measure. The subjects were standing upright adjacent to the heels, while their hands and arms on the side of the foot. After giving a normal breath, the horizontal plane were placed around the abdomen, about 5 cm below the belly buttonhole. The chest region is measured from its bulging position. The baseline circumference was measured at the pubis level from the front while the subject was standing and at the maximal protrusion level of the hip muscles from the back.

Body mass index (BMI), calculated from height and weight ($\text{Weight}_{\text{kg}} / \text{Height}_{\text{cm}}^2$)

Sit and rich test was used for flexibility measurement (29). And flamingo balance test protocol was used for balance performance (7). For the evaluation fitness level of participants Harvard step test protocol was used (4). HDL and LDL values was analyzed Unice Bekman Coulter Unicel DXC 800 device.

Data Analyses

Statistical analyzes were performed on the personal computer using SPSS 15 version. Mann Whitney U test was used for the comparison of pre- and posttests. Significance level was set 0.05 and 0.01 level.

RESULTS

At the end of the comparison statistic, it was determined that there was a significant difference in weight values, pulse, BMI, chest, abdomen, hip, baseline, flexibility, balance values in the Pilates group (Table 1).

In the cyclic exercise group comparison of pre and post measurements statistic, it was determined that a significant difference between the body weight, chest, waist, abdomen, hip, flexibility, balance values ($p < 0.05$; Table 2).

DISCUSSION

In the field of physical activity, many kinds of exercises are being investigated from past to present day. Today's wellness programs are also held in the sports center, the needs of the people,

their interests, exercise plans are prepared in accordance with time.

In this study, we investigated the effects of cyclic exercise and Pilates on some physical fitness-related parameters.

Pilates exercises can reduce pain and constant discomfort, improves strength and flexibility, therefore the tool is not just a fitness exercise carried out in the fitness center. It includes posture measurements to start a basic work well starting the main muscle groups, various series of exercises that increase with difficulty (26). Cyclic exercise is thought as a system for rehabilitation purposes, regulating the body fat ratio, providing psychological and social improvement (18).

Table 1. Pre and posttest comparison of Pilates group (Means \pm SD).

Variables	Before exercise	After exercise	Mean Differences	Z	P
Weight (kg)	60.66 \pm 6.485	59.76 \pm 6.361	0.898	-2.492	.013*
Rest Pulse (pulse/min)	84.80 \pm 3.823	83.50 \pm 6.4301	1.3	-2.530	.011*
Diastolic Pre. (mmHg)	8.00 \pm 1.154	8.00 \pm .875	-0.1	-.447	.655
Systolic Pre. (mmHg)	10.9 \pm 0.737	10.9 \pm 0.999	0.2	.024	0.967
BMI (kg/cm ²)	22.86 \pm 3.700	21.47 \pm 1.929	1.39	-2.549	.011*
Body Fat (%)	24.64 \pm 1.5.150	25.29 \pm 4.957	-0.652	-.416	.677
Chest (cm)	88.60 \pm 6.397	87.50 \pm 6.587	1.1	-2.333	.020*
Waist (cm)	75.20 \pm 8.521	74.80 \pm 8.230	0.4	-1.414	.157
Abdominal (cm)	90.40 \pm 7.198	89.10 \pm 7.233	1.3	-2.392	.017*
Hip (cm)	98.60 \pm 4.575	97.50 \pm 7.326	1.1	-2.460	.014*
Basin (cm)	92.80 \pm 3.359	91.40 \pm 3.893	1.4	-2.585	.010*
Flexibility (cm)	15.65 \pm 7.055	19.15 \pm 5.725	-3.5	-2.680	.007*
Balance	6.90 \pm 1.969	4.50 \pm 1.269	2.4	-2.714	.006*
Fitness level	75.40 \pm 11.577	74.70 \pm 1.269	0.7	-.771	.441
HDL(mg/dl)	28.54 \pm 1.636	33.86 \pm .889	-75.84	-.211	.833
LDL(mg/dl)	97.92 \pm 25.917	90.87 \pm 30.062	7.05	-1.400	.161

* $p < 0.05$

Table 2. Pre and posttest comparison of cyclic training group (Means \pm SD).

Variables	Before exercise	After exercise	Means Differences	Z	P
Weight (kg)	68.99 \pm 13.625	67.59 \pm 14.676	1.4	-2.143	.032*
Rest Pulse (pulse/min)	81.80 \pm 6.957	81.10 \pm 6.756	0.7	-1.838	.066
Diastolic Pre. (mmHg)	7.4 \pm 0.843	7.90 \pm 0.994	-0.5	.066	.066
Systolic Pre. (mmHg)	8.1 \pm 1.354	8.00 \pm 1.638	0.1	-1.000	.317
BMI (kg/cm ²)	25.738 \pm 4.569	26.229 \pm 4.539	-0.491	-.459	.646
Body Fat (%)	34.26 \pm 6.416	30.57 \pm 47.361	3.72	-2.652	-2.652
Chest (cm)	96.90 \pm 11.694	93.30 \pm 11.605	3.6	-2.536	.011*
Waist (cm)	82.40 \pm 12.598	80.50 \pm 11.394	1.9	-2.536	.011*
Abdominal (cm)	95.30 \pm 9.843	91.50 \pm 9.834	3.8	-2.661	.008*
Hip (cm)	102.90 \pm 8.748	100.90 \pm 7.324	2	-2.539	.011*
Basin (cm)	94.50 \pm 7.090	93.10 \pm 6.244	1.4	-1.903	.057
Flexibility (cm)	16.60 \pm 9.203	20.20 \pm 9.126	-3.6	-2.677	.007*
Balance	5.90 \pm 2.558	4.50 \pm 3.171	1.4	-2.360	.018*
Fitness level	70.40 \pm 7.734	69.90 \pm 4.201	0.5	-.314	.753
HDL(mg/dl)	55.63 \pm 13.579	55.10 \pm 12.433	0.53	-.102	.919
LDL(mg/dl)	118.63 \pm 13.579	91.08 \pm 55.998	27.23	.919	.203

* $p < 0.05$ ** $p < 0.01$

In these study we was found that a significant decreases in weight values, resting pulse, BMI, chest, abdomen, hip and basin circumferences. On the other hand we found that significant increase of flexibility and balance values in the Pilates group. Similarly the plates group, we determined that after the training program a significant decrease of the body weight, chest, waist, and abdomen and hip circumferences cyclic training group. Afterwards it was determined statically significant increase of flexibility and balance values ($p < 0.05$).

Segal et al. (25) have researched that one hour a week for six months Pilates exercises on middle-aged women. At the end of this application, no significant change in weight, body fat percentage, waist and hip circumference values was observed (25). Otherwise, Jago et al. (12) detected of four week plates exercises important decrease of body mass index in girls.

In the studies while in cyclical group changes was insignificant, resting heart rate of plates group identified a significant reduction after the training programs. The programs applied in both groups did not significantly affect blood pressure. On the other hand, there was no significant change in fitness levels in relation to cardiovascular efficiency in both groups. Both cyclic training program and plates training program not efficiently well effect on subjects.

Ewart et al. (6) evaluated the effects of aerobic exercise physical education on blood adolescent girls. And he concluded that aerobic exercise physical education is a feasible and effective health promotion strategy adolescent girl. Aerobic exercise like walk and running and other form can reduces blood pressure in both hypertensive and normotensive persons. An increase in aerobic physical activity can improve fitness level and capacity. These can be considered an important component of lifestyle modification for prevention and treatment of high blood pressure (27). Many studies in the literature report that the positive effects of exercise on heart rate (5,25). Leicht et al. (20) demonstrated that during steady-state, moderate intensity exercise of the same heart rate of whole body exercise, lover body and upper body exercise positively effect of heart rate.

Imamoglu et al. (10) found that aerobic exercise in the study caused a significant difference in heart rate. Another study was demonstrated that aerobic exercise of women resulted in a 6% decrease in systolic blood pressure, 8% decrease in diastolic

blood pressure, and 10% decrease in resting heart rate (7).

In these study has been determined that both exercises have a positive effect on the body circumference measurements, flexibility and balance. The positive effects of exercise on anthropometric characteristics is a general situation (10,22). Similarly anthropometric characteristic the flexibility and balance are very impressive properties from physical activity. In this context both plates exercise and circuit exercises affected positively flexibility and balance ability. Koa at al. studied 12-week Pilates course on lower limb muscle strength and trunk flexibility in women. They confirm that a convenient Pilates exercise intervention can significantly improve muscle strength and trunk flexibility in women (18). Segal et al. presented a similar effect of plates exercise on flexibility (25).

Besides all these positive effects, neither plates exercise nor cyclic exercise did not affect statistically significant on HDL and LDL. We were expecting beginning of the study that the programs would have implemented at the positive effect on these values. In our opinion, the severity of the intensity of both exercise programs remained low, for affecting these values. In addition plates and cyclic exercises improve especially a structure that affects strength and muscle resistance. Hagner-Derengowska et al. (2015) compared the effect of Pilates and walking exercises on 196 overweight or obese women and they found lover effect of plates exercise on HDL and LDL than walking exercise (8). Another revive study demonstrated that the effect of Pilates on classic cardiometabolic risk factors: triglycerides, glucose, and high-density lipoprotein cholesterol no beneficial results (13).

In a conclusion, It was found in this study both plates and cyclic exercises significantly positive effected weight values, resting pulse, BMI, chest, abdomen, hip and basin circumferences. On the other hand it was found that significant increase of flexibility and balance values. The programs applied in both groups did not significantly affect blood pressure, fitness levels HDL and LDL. In our opinion, the severity of the intensity of both exercise programs remained low, for affecting these values. In addition plates and cyclic exercises improve especially a structure that affects strength and muscle resistance. We can recommend that fixed exercise program include walking, running,

swimming, plates, cyclic resistance etc. for wellness and fitness.

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