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ABSTRACT

This study investigated the effects of 30 minutes of endurance jogging on pulse rates at rest, during exercise, and at recovery and eight skinfold fat measures in middle-aged women. Subjects were 15 middle-aged women between 30 and 58 years of age who had not been engaged in any exercise program at least for 1 year. Eight sedentary subjects were used as a control group. The program involved continuous progressive jogging; the intensity of work out was set at 14 minutes per mile at the beginning of the program and increased to 8 minutes at the end of the tenth week. The subjects exercised 30 minutes a day, 5 days a week for a total of 16 weeks. A 6-minute submaximal exercise test was administered to all subjects using a Monarch bicycle ergometer; the fasting body weight and eight skinfold fat measures were obtained from all the subjects, using Lange Skinfold Fat Caliper. Results indicate that 30 minutes of jogging produced a significant reduction in resting, exercise, and recovery pulse rates. A significant reduction occurred in skinfold fat measures, and body weight. (Author/JB)

# EFFECTS OF ENDURANCE JOGGING ON CARDIOVASCULAR SYSTEM AND BODY COMPOSITION IN MIDDLE-AGED WOMEN

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The effects of physical exercises on cardiovascular system and body composition have been studied extensively. There is much evidence to indicate that endurance exercise plays an important role in promotion of cardiovascular health and in reducation of body fat(1, 2, 3, 4, 5, ). However the effects of exercise(jogging) on middle-aged women have not been throughly investigated.

So it was the purpose of this study to determine the effects of 30 minutes endurance jogging exercise on resting pulse, maximum exercise pulse and five minutes recovery pulse rates and body composition in middle-aged women.

## METHOD:

The subjects in this study were 12 middle-aged women between 30 to 58 years of age. These women were mainly school teachers who have not been engaged in any regular physical exercise program at least for more than a year when they were enrolled in this program. Eight sedentary women with comparable age were used as a control group. The exercise program was a progressive endurance jogging and walking. The entensity of work-out was set at 14 minutes per mile at the beginning of the program and it was gradually increased to 8-9 minutes per mile at the end of tenth week of the program. The subjects exercised 30 minutes a day, three times a week and

for total of 20 weeks.

TESTING:

1. Cardiovascular test: A six minutes submaximal exercise test on ergo-cycle was administrated to all subjects . The Monarch Bicycle Ergometer was used for testing. The procedures followed in testing were similar to those designed by Astrand, Michael and Harvath. The pulse rate recordings were made on the Exercise Cardio-Tachometer. Upon the arrival of the subjects to the laboratory, the subjects rested for 15 minutes and then resting pulse rate was recorded. Then the subjects took position on the bicycle and pedalled with the work load setting at 0.0 KPM at a rate of 50 RPM. With onset of the 6 minutes exercise period, the work load was increased by 150 kpm with pedalling rate remaining the same. At the end of first minute and subsequent minutes of testing, the work load was increased by 150 kpm until a condition arrived where the subjects were unable to keep up with the prescribed rate or the 6 minutes exercise period was terminated. At this point the work was stopped and maximum exercise pulse rate and five minutes recovery pulse rate( 1, 2, 3, 4, 5mins) were recorded.

Body Composition: Fasting body weight and eight skinfold fat measures were obtained from the subjects in the morning before and at the termination of the exercise program. The Lange Skinfold Fat Caliper was employed in testing.

Treatment of the Data:

For the treatment of the data, t test was used to determine the differences between means of related measures and five percent level of significant was accepted.

RESULTS:

At the end of 20 weeks of conditioning a significant reduction occured

in resting pulse rate among exercised group( table 1). The resting pulse rate dropped from 75 to 66.4 per minute. The change was significant at one percent level. The data for the mean of maximal pulse rate is presented in table 2. which indicates a significant change .The maximum exercise pulse reduced from 164.4 to 147 per minute.

TABLE I

Resting Pulse Rate

| Means | | SD | | |
|---|---|---|---|---|
| Initial | Final | Initial | Final | t |
| 75 | 66.4 | 11.6 | 11.0 | 4.7 |

TABLE II

Maximum Exercise Pulse Rate

| Means | | SD | | |
|---|---|---|---|---|
| Initial | Final | Initial | Final | t |
| 164.4 | 147 | 9.2 | 16.0 | 3.84 |

Post-Exercise Pulse Rates:

The data for five minutes recovery pulse rates are presented in table III. The results indicate a significant chnage in one minute, two minutes, three minutes, four minutes and five minutes recovery pulse rates. These changes were statisticallly significant at one per cent level.

TABLE III

Post-Exercise Pulse Rates

| Time | Means Initial | Means Final | SD Initial | SD Final | t |
|---|---|---|---|---|---|
| 1:0 | 124.6 | 106.5 | 14.2 | 18.0 | 3.75* |
| 2.0 | 108.6 | 91.6 | 15.8 | 16.8 | 3.48 |
| 3.0 | 101.3 | 84.0 | 14.3 | 16.0 | 3.47 |
| 4.0 | 97.6 | 81.4 | 12.9 | 15.4 | 3.77 |
| 5.0 | 94.3 | 79.2 | 12.8 | 14.5 | 3.70 |

Body Composition:

Data presented in table VI reveals that significant reduction in the body weight and eight skinfold fat measures occured as a results of training.

TABLE VI

Body Composition

| | Means Initial | Means Final | SD Initial | SD Final | t |
|---|---|---|---|---|---|
| Body Weight | 155.0 | 148.3 | 29.2 | 25.4 | 3.21 |
| Skinfold Fat | 226 | 184 | 13.2 | 12.7 | 3.21 |

* 3.05 requires for one per cent significance.

## DISCUSSION

Thirty minutes jogging exercise per day lowered the resting, exercise and recovery pulse rates. A lower pulse rate following a 20 weeks conditioning program is an indication of improvement in stroke volume, and contractibility of cardiac muscle. The mean pulse rates for exercised group were lower f r each minute of recovery period compared to the pre-training levels. This suggests that there was a fine blood transport and faster removal of the metabolic waste products The findings of this study are similar to those reported by Balke(3), Wallin(4), Skinner(5), Pollock(6) and Tooshi(7) where they reported that with training there was a reduction in the pulse rates for identical work load and a faster recovery.

This study also indicates a substantial change in the body weight. The chnage in the body weight suggests that 30 minutes jogging exercise has created a demand for more energy in the body which partially was met by the metabolism of the fat. It is reasonable to conclude that 30 minutes exercise a day would be an ideal amount of work-out to reduce and maintain the body weight.

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