



The Effects of Decaffeinated Green Tea Extract On Body Composition And Estimated VO₂Max

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Abstract

INTRODUCTION: Green tea is rich in antioxidant polyphenols such as catechins and flavonols, and it is also composed of caffeine. The extract of tea is said to have some vasodilator effects which can have cardiovascular benefits, and it is also said to reduce body fat by means of fat oxidation. Many studies have been done using regular green tea on the body as opposed to decaffeinated green tea which solely contains polyphenols. **PURPOSE:** The purpose of this research study is to observe and record the effects decaffeinated green tea extract pills have on body composition and estimated VO₂Max when taken over a 6 week period. **METHODS:** Ten subjects (age 23.9 ± 2.1 years; height 159.1 ± 4.1 cm; weight 85.1 ± 5.7 kg; BMI of 33.6 ± 1.9) volunteered to participate in this study. Each subject was asked to come to the Kinesiology laboratory, the height, weight and BMI were measured and calculated by utilizing a scale. To estimate VO₂Max and maximal workload capacity, the YMCA sub-maximal test was used. The test requires the subjects to pedal 50 rpm beginning with a workload set at 150 kpm (0.5 kp; 25 Watts). The HR was recorded every minute for three minutes. The BP and RPE were recorded once every 3 minutes. If the last two heart rates were greater than 6 beats per minute (bpm) apart then the subject worked an extra minute until steady state was reached. The workloads after the initial stage were set based on the HR. The test was stopped after the subject reached steady state with HR between 110 and 85% of estimated HR max in two consecutive stages. After all measurement and tests were recorded, the subjects were given 42 pills of either placebo (gelatin capsules filled with sugar) or decaffeinated green tea extract. Subjects were directed to take one pill every day for 6 weeks and to keep a weekly log of exercise and caffeine intake. After 6 weeks all measurements and test were repeated and recorded. A two tailed *t*-test was used and the α level of significance was set to $p \leq 0.05$. **RESULTS:** There was no significant difference between the pre values (81.7 ± 3.2 kg; 32.8 ± 1.4 BMI; 25.4 ± 2.7 ml/kg/min; 890 ± 112 (kgm/min) and the post values (82.3 ± 2.8 kg; 33 ± 1.2 BMI; 25.7 ± 3.0 ml/kg/min; 905 ± 116 kgm/min) for the extract group ($p > 0.05$). No significant differences were obtained between the pre values (88.4 ± 8.3 kg; 34.4 ± 1.9 BMI; 24.5 ± 6.6 ml/kg/min; 930 ± 328 kgm/min) and the post values (88.6 ± 9.0 kg; 34.4 ± 1.9 BMI; 26.6 ± 5.8 ml/kg/min; 1015 ± 294 kgm/min) for the placebo group either ($p > 0.05$). **CONCLUSION:** The results of this study indicate that decaffeinated green tea extract has no effects on weight, BMI, estimated VO₂Max, or estimated maximal work capacity. However, this study had many limitations that should be acknowledged such as not controlling for activity or diet and managed for future studies.

Purpose

The purpose of this research study was to observe and record the effects decaffeinated green tea extract pills had on body composition and estimated VO₂Max when taken over a 6 week period.

Methods

Subjects

- 10 unconditioned individuals
- Age 23.9 ± 2.1 years; Height 159.1 ± 4.1 cm; Weight 85.1 ± 5.7 kg; BMI of 33.6 ± 1.9

Instrumentation

- Heart Rate Monitor, Sphygmomanometer, Stethoscope, Weight Scale, Cycle Ergometer

Methods (cont'd)

Protocol/Experiment Design

The YMCA sub-maximal test was used. The seat on the cycle ergometer was adjusted for each subject. Subjects allowed to warm up for one minute. Prescribed rate (50 rpms) with a workload set at 150 kpm (0.5 kp; 25 Watts) for the first stage. Heart rate (HR) was recorded every minute for three minutes. Blood pressure (BP) and RPE recorded once every 3 minutes. If the last two heart rates were greater than 6 beats per minute (bpm) apart then the subject worked an extra minute until steady state was reached. The workloads after the initial stage were set based on the HR. If the HR is greater than 80 bpm the workloads will change as follows: 750kgm (2.5 Kp), 900kgm (3.0 Kp), and 1050 kgm (3.5 Kp); HR between 80 and 89: 600 kgm (2.0 Kp), 750 kgm (2.5 Kp), 900 kgm (3.0 Kp); HR between 90 and 100: 450 kgm (1.5 Kp), 600 kgm (2.0 Kp), 750 kgm (2.5 Kp); HR greater than 100: 300 kgm (1.0 Kp), 450 kgm (1.5 Kp), 600 kgm (2.0 Kp). The test was stopped after the subject reached steady state with HR between 110 bpm and 85% of estimated HR max in two consecutive stages. After all measurement and tests were recorded, the subjects were given 42 pills of either placebo (gelatin capsules filled with sugar) or decaffeinated green tea extract. Subjects were directed to take one pill every day for 6 weeks and to keep a weekly log of exercise and caffeine intake. After 6 weeks all measurements and test were repeated and recorded. To analyze the pre and post data, a two tailed *t*-test was used and the α level of significance was set to $p \leq 0.05$.

Results

Table 1. Subject Demographics

	Mean	SD	Max	Min
Age (years)	23.9	2.1	28	20
Height (cm)	159.1	4.1	167.5	150
Weight (kg)	85.1	5.7	100	76.8
BMI	33.6	1.9	36.4	30.1

Results (cont'd)

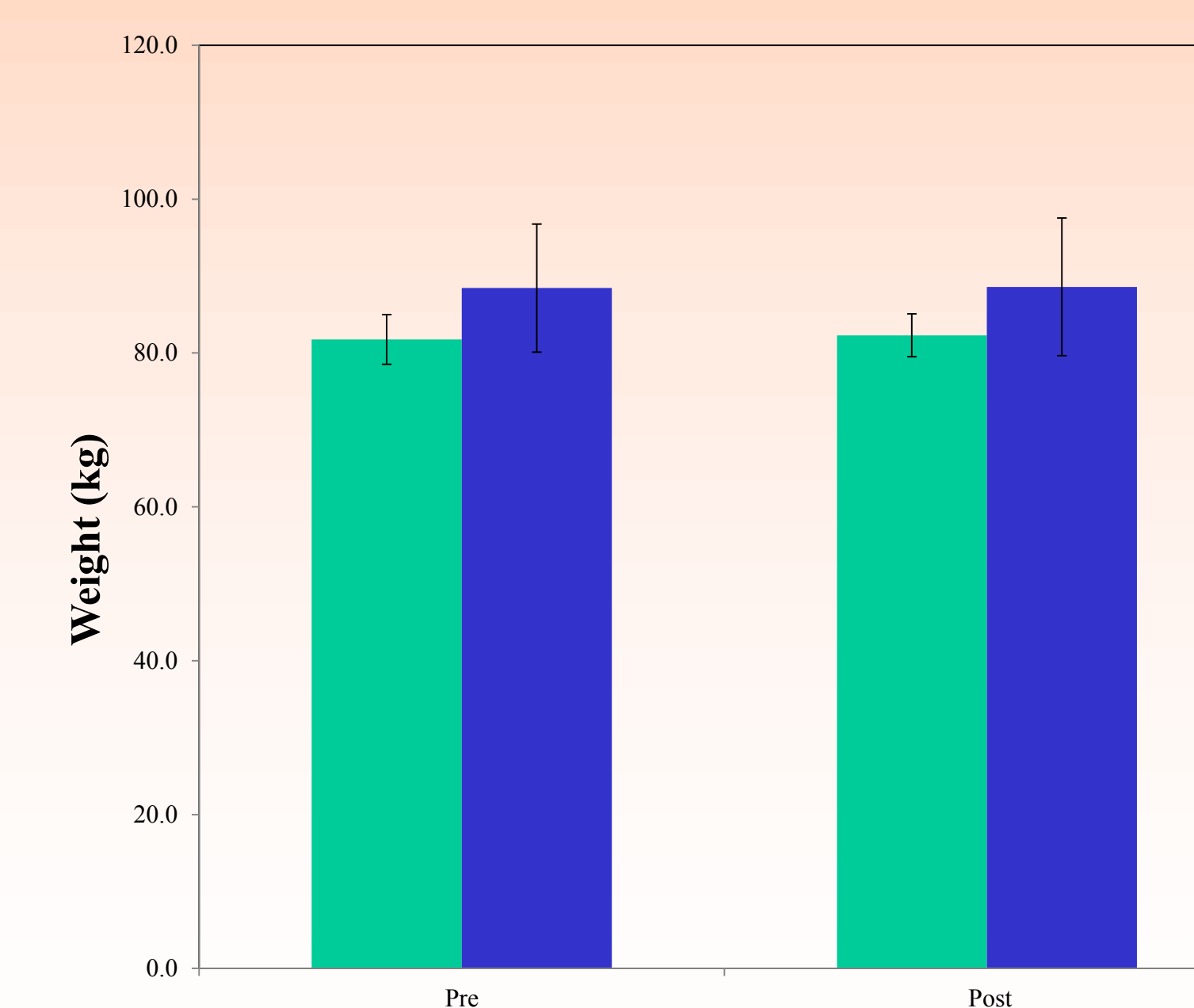


Figure 1. Weight changes observed after 6 weeks for both the extract and placebo groups

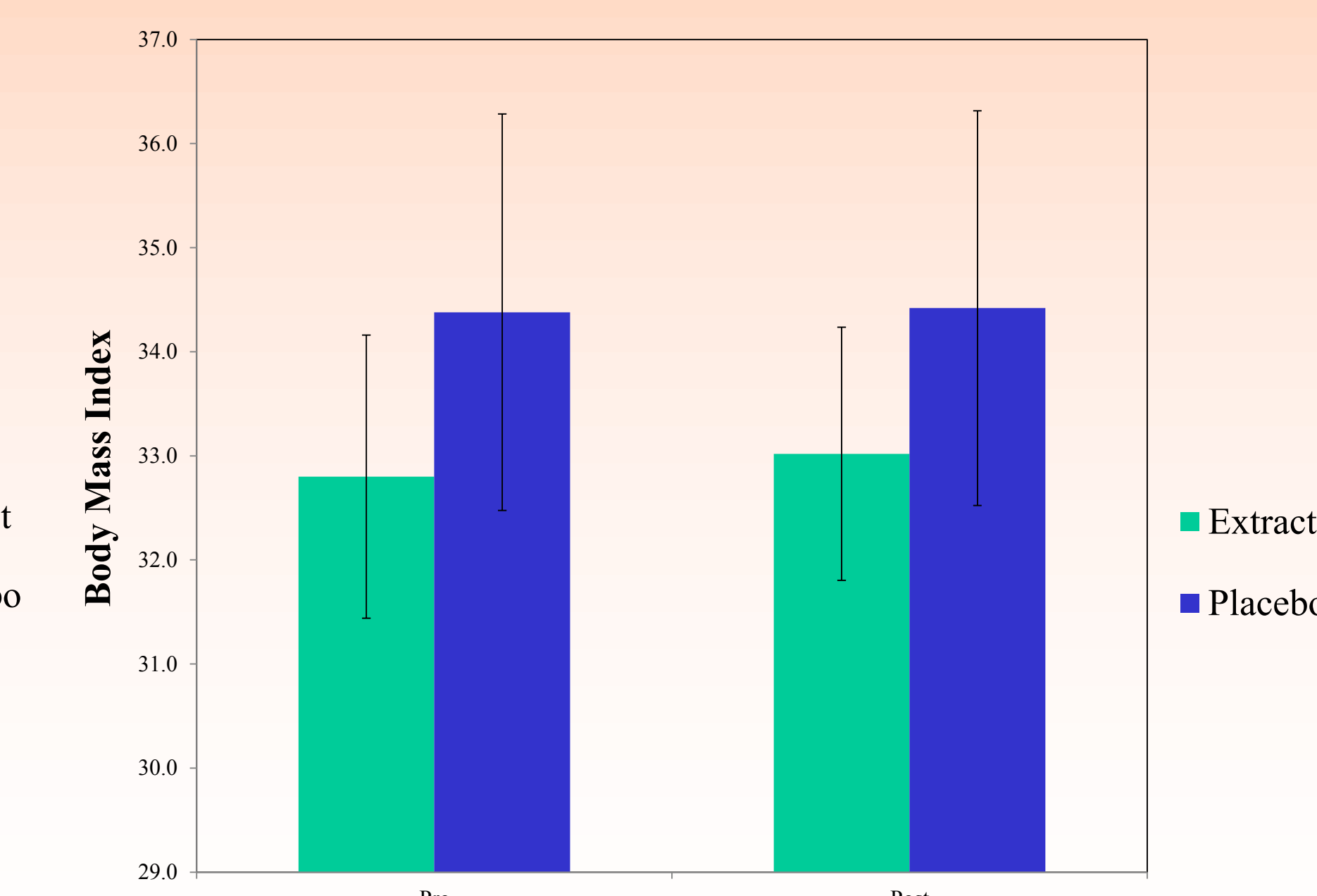


Figure 2. BMI changes observed after 6 weeks for both the extract and placebo groups

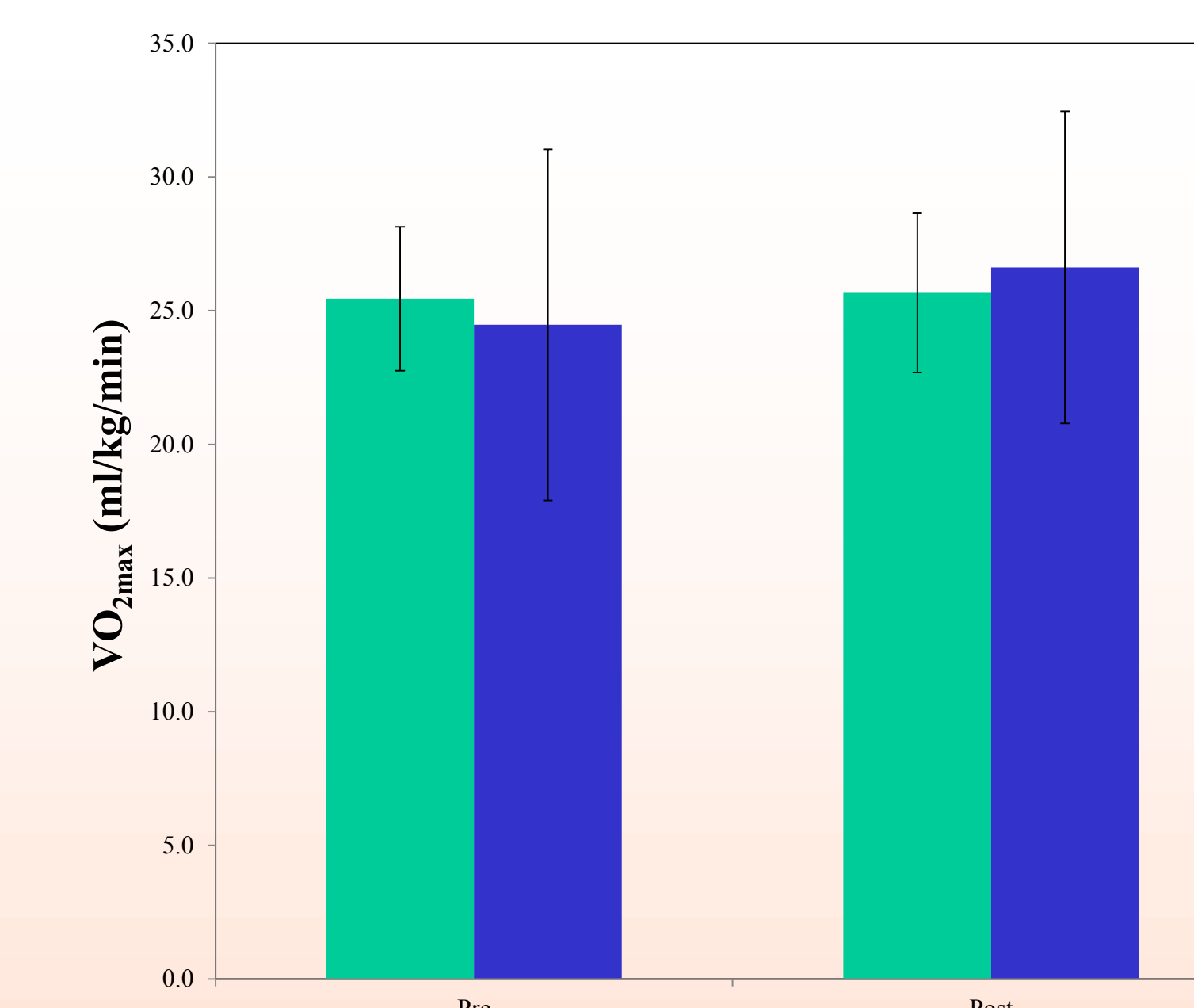


Figure 3. Estimated VO₂max changes observed after 6 weeks for both the extract and placebo groups

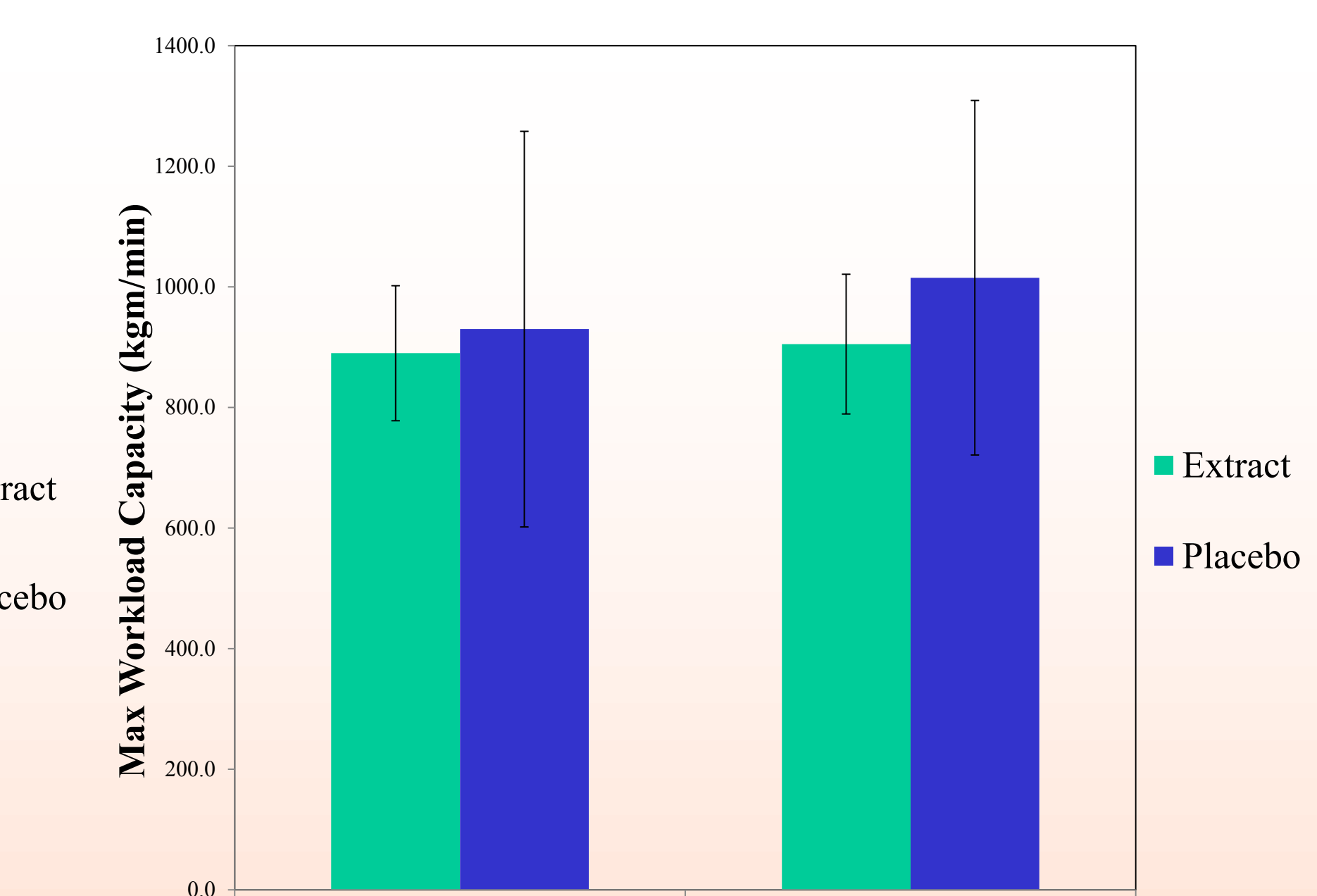


Figure 4. Estimated max workload changes observed after 6 weeks for both the extract and placebo groups

Conclusions

The results of this study indicated that decaffeinated green tea extract had no effects on weight, BMI, estimated VO₂Max, or estimated maximal work capacity. However, this study had many limitations that should be acknowledged such as not controlling for activity or diet, and these should be managed for future studies.