



# Effects Of Upper Body Exercise On Physiological Variables In Men And Women

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## Abstract

**Introduction:** Monitoring exercise intensity during an exercise bout is important to provide feedback. Monitoring heart rate, blood lactate, and rate of perceived exertion provide useful information that give feedback to the exerciser. Research has suggested that rate of perceived exertion is more of an appropriate measure of exercise intensity than individual physiological variables and that RPE can be correlated with other physiological measures such as heart rate and blood lactate. With the pain scale (VAS) research has shown that it tends to restrict the rating behavior into a linear regression whereas the RPE has an incremental curve because it is able to discriminate between the most extreme and maximal intensities.

**METHODS:** Five women (W; age  $23.2 \pm 2.86$  yrs) and five men (M; age  $23.6 \pm 2.07$  yrs), who were moderately physically fit, volunteered to participate in this study. Each subject had their height, weight, resting heart rate, and resting blood lactate taken prior to the test. After the subjects sat down at the arm ergometer and began moving their arms, the machine was set to a hill profile setting at a level 12 for the men and a level 8 for the women. It was set for 10 minutes and the exercise began. Every 2 minutes during the test each subject's heart rate, rate of perceived exertion and pain level score were recorded. At the end of the 10 minutes the subjects stopped moving their arms and their blood lactate was taken again. The RPE was assessed by using a Borg 6-20 category scale and the Visual analog scale was assessed using a 0-10 cm category pain scale.

**RESULTS:** The height calculated was  $68.4 \pm 5.7$  (M) and  $64.6 \pm 1.67$  (W) which showed that the subjects were similar in height ( $p = 0.15$ ). For weight  $168 \pm 19.3$  (M) and  $151.4 \pm 26.6$  (W) there was also no significant difference ( $p = 0.22$ ). For the pre BLa (M:  $5.46 \pm 2.5$ ; W:  $3.08 \pm 0.9$ ) and post BLa (M:  $13.12 \pm 5.2$ ; W:  $10.26 \pm 2.1$ ) there were no significant differences ( $p = 0.15$ ). The VAS (M:  $10.8 \pm 5.54$ ; W:  $5.8 \pm 1.64$ ) was not significant ( $p = 0.07$ ) nor was the HR (M:  $159.4 \pm 19.37$  bpm; W:  $168.6 \pm 21.9$  bpm) significantly different ( $p = 0.30$ ). The RPE (M:  $16.4 \pm 5.13$ ; M:  $15.8 \pm 3.03$ ) values showed a similar result ( $p = 0.14$ ).

**Conclusion:** The results of this study indicated that there was no difference among moderately physically fit men and women when it comes to HR, RPE, VAS, and BLa. This was an unexpected finding as men generally have more muscle mass, however, the similarity in height and weight may have been a factor.

## Background



- Men tend to have more muscle mass compared to women, but this does not mean that they have more muscular endurance.
- Research says that men fatigue more quickly than women, due to women being able to recruit more synergistic muscle.
- Based on previous research it is expected that there will be a difference in the physiological variables between men and women due to the muscle mass difference in men and having to work harder.

## Purpose

The purpose of this study was to evaluate the effects of upper body exercise and the relationship of the physiological variables in men and women

## Methods

### Participants:

10 subjects (5 moderately physically fit females and 5 moderately physically fit males)

Age range: (18-30 years)

### Criteria for experiment:

Subjects had to have a background in exercise and be at least moderately physically fit (30min. a day at least 3-4 times a week).

### Measures:

Experiment took place at the Cardiovascular Research Laboratory here at UTA  
Subjects were instructed to wear athletic wear.

### Protocol:

The experiment consisted of 2 groups men and women

Blood lactate was take prior to test.

Each subject was instructed to sit on the arm ergometer machine.

The ergometer machine was set to a hill profiles setting.

The women were at a level 8 resistance and men were at a level 12 resistance.

Both men and women went for 10 minutes on machine keeping the watts at a level 50 or higher.

During the test every 2 minutes their heart rate, RPE, and Pain level (VAS) was recorded.

Blood lactate was taken again post test.

### Data Analysis:

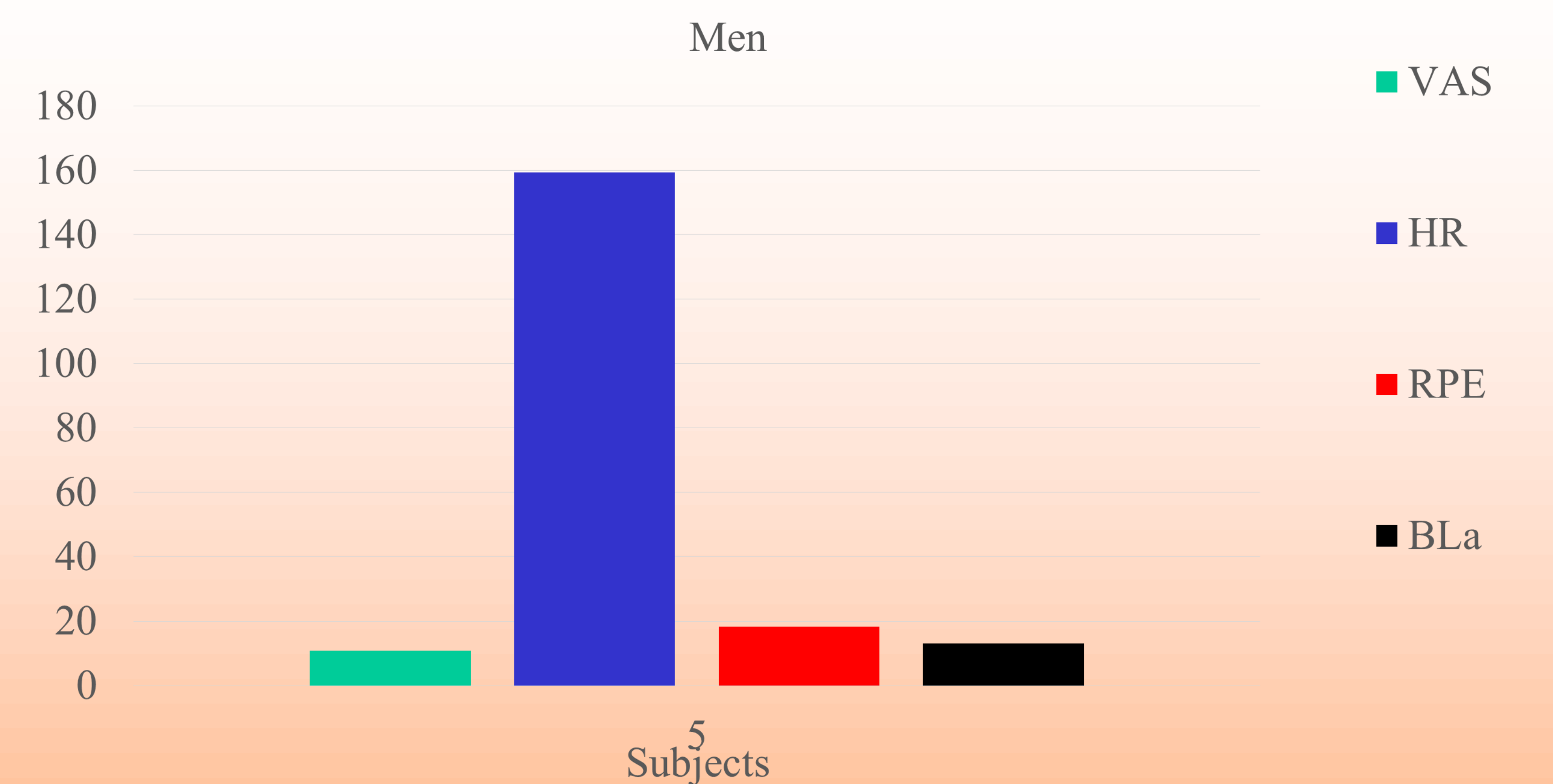
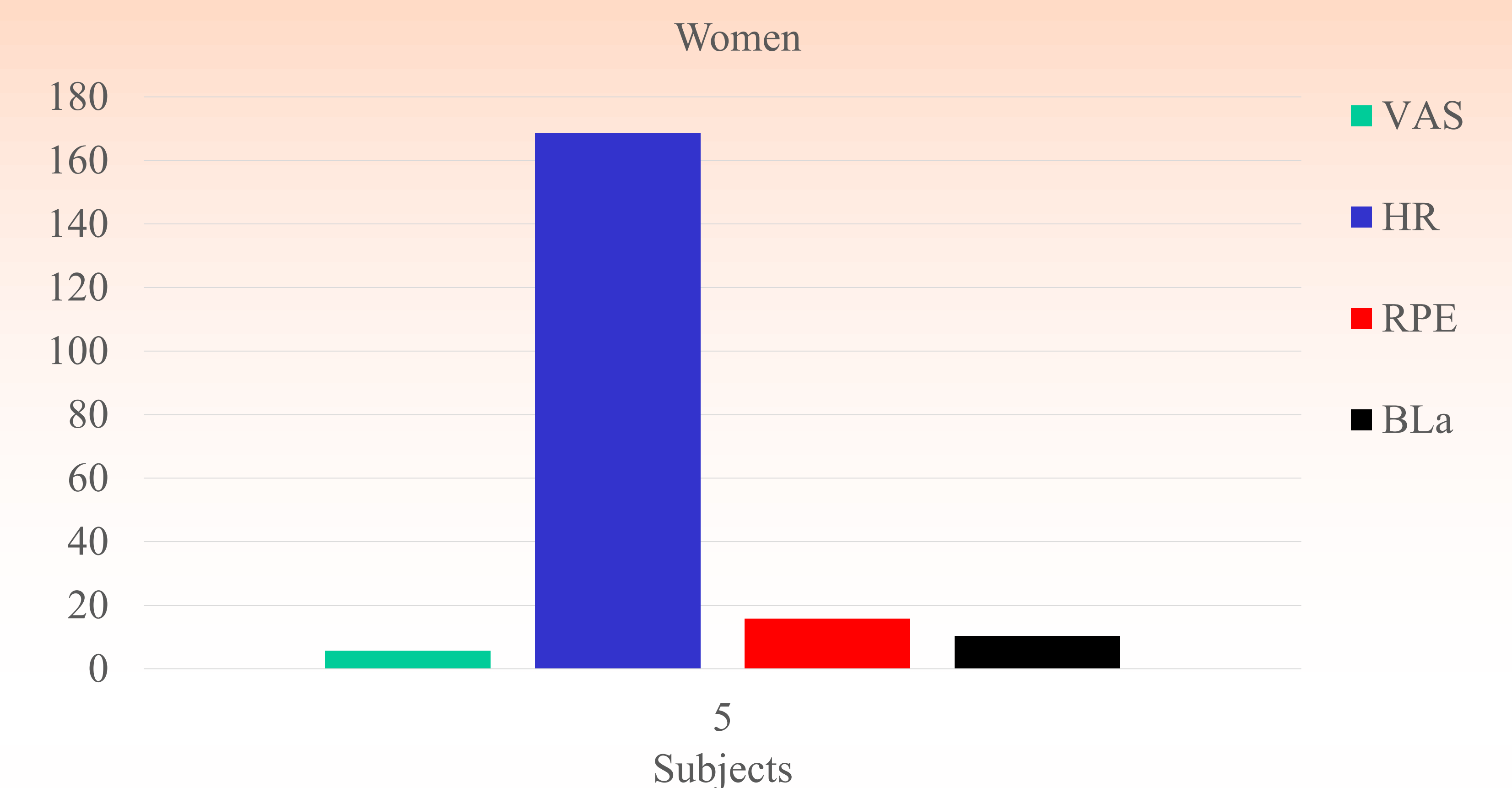
Design consisted of 2 groups men and women.

T test were performed to compare the max values of each variable among men and women

## Results

The height calculated was  $68.4 \pm 5.7$  (M) and  $64.6 \pm 1.67$  (W) which showed that the subjects were similar in height ( $p = 0.15$ ). For weight  $168 \pm 19.3$  (M) and  $151.4 \pm 26.6$  (W) there was also no significant difference ( $p = 0.22$ ). For the pre BLa (M:  $5.46 \pm 2.5$ ; W:  $3.08 \pm 0.9$ ) and post BLa (M:  $13.12 \pm 5.2$ ; W:  $10.26 \pm 2.1$ ) there were no significant differences ( $p = 0.15$ ). The VAS (M:  $10.8 \pm 5.54$ ; W:  $5.8 \pm 1.64$ ) was not significant ( $p = 0.07$ ) nor was the HR (M:  $159.4 \pm 19.37$  bpm; W:  $168.6 \pm 21.9$  bpm) significantly different ( $p = 0.30$ ). The RPE (M:  $16.4 \pm 5.13$ ; M:  $15.8 \pm 3.03$ ) values showed a similar result ( $p = 0.42$ ).

## Results (cont'd)



## Conclusions

- The experimental study showed that when comparing the max values of each variable for men and women there was no significant difference.
- Due to the subject both men and women being similar in height and weight this may have been a factor as to why there was no difference.
- The men had to work harder than the women due to the difference in resistant level so, this could have also been a factor.