



# TRUE ALPINE RUNNER: The First Weight Loss Treadmill?

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A Case Study Review of User Interface, Self-Selection, and  
Superior Caloric Output

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## A Case Study Review of the True Alpine Runner User Interface, Self-Selection, and Superior Caloric Output

# Background

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The primary reason individuals start exercising is to achieve a weight loss goal. There are a multitude of factors that lead to success in achieving this goal. Teixeira, Silva, Mata, Palmeira, and Markland (2012) found that when individuals feel competent and autonomous in reaching a weight loss goal, their efforts are far more likely to yield success. Additionally, Glaros and Janelle (2001) found that varying exercise intensity is associated with greater enjoyment. Vansteenkiste, Matos, Lens, and Soenens (2007) found that a major barrier to exercise arises when the method and the ego are in conflict. Their study suggests that individuals gravitate to methods of exercise in which they possess mastery. It's not surprising then that most individuals choose the treadmill as their primary exercise tool. However, a majority of all treadmill users default to the quick-start option, leaving the elevation flat. While the treadmill promotes familiarity (and therefore use), because of the lack of variation in exercise intensity and a relatively low caloric output, long-lasting behavior change, enjoyment, and effective weight loss are inherently diminished.

The True Alpine Runner has a redesigned user interface that places variable incline and variable speed as one-touch options central on the dashboard. This redesign may encourage the user to self-select variable incline and speed as quick-start options. With 30% incline and 3% decline, the True Alpine Runner has the additional benefit of providing a far more rigorous workout. This redesign accompanied with the rigorous workout potential raises significant questions concerning user trends for the True Alpine Runner. For example, does the redesign encourage the user to self-select variable incline and speed as quick-start options? If so, does this change ultimately lead the user to self-select activity that elicits greater caloric expenditure? If the latter is the case, the True Alpine Runner is a far more effective weight loss tool than other types of treadmills.

## Study Design

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For two weeks prior to the delivery of True Alpine Runners in a newly outfitted commercial fitness facility in Maryland, data on hours of use and mileage were recorded directly from the treadmills to be replaced by the True Alpine Runners. Data from this collection served as a benchmark for normal use strategies, thereby minimizing the impact of compounding data on treadmill placement, accessibility, and visibility. During off-peak hours, two True Alpine Runners replaced the two treadmills from which benchmark data was collected. The True Alpine Runner model, using the Ignite Console (pictured left), utilized in the study was thoughtfully considered to match the two conventional treadmills replaced on the fitness floor. After installation, for two weeks, hours of use and mileage were recorded directly from the True Alpine Runners in order to compare differences in use trends. No management or personal training staff reported awareness of the new treadmills on the fitness floor, suggesting that the True Alpine Runners were placed conspicuously enough to not draw attention.

Following the initial two-week data collection, the second phase of the study launched. During this phase, 24 participants were broken into two groups: the control group and the True Alpine Runner group. A standard exercise protocol was established, called the Six-Week Buddy Workout Challenge. Participants were informed that this six-week, twice weekly challenge was designed to promote weight loss. By allowing participants to work out in groups of two (buddies) and by refunding program fees to groups that successfully completed the entire six-week challenge, adherence was successfully promoted. Initial measurements of arm and waist girth (using a weighted tape measure), arm and abdominal fat (using Lange calipers), and resting VO<sub>2</sub> (using a gold-standard medical-grade device) were measured for every participant prior to starting the Six-Week Buddy Workout Challenge. All assessment measures were taken by a registered clinical exercise physiologist in order to decrease intertester variability. The control group and the True Alpine Runner group participated in the same exact protocol, the only difference being that the True Alpine Runner group utilized the True Alpine Runner as opposed to a conventional treadmill.

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No management or personal training staff reported awareness of the new treadmills, suggesting that the True Alpine Runners were placed conspicuously enough to not draw attention.

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The Six-Week Buddy Workout Challenge Protocol

Action	Duration of Action	Total Duration
Treadmill	10:00	10:00
Rest/Transition	2:00	12:00
Resistance Circuit	8:00	20:00
Rest/Transition	2:00	22:00
Treadmill	10:00	32:00
Rest/Transition	2:00	34:00
Resistance Circuit	8:00	42:00
Rest/Transition	2:00	44:00

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Two on-site certified personal trainers with college-level research experience were recruited to implement the second phase of the study. Both personal trainers participated in a three-hour accredited on-boarding course.

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RESISTANCE CIRCUIT  
 10 push-ups  
 10 TRX rows  
 16 (8 per leg) DB lunges  
 20 KB swings

Two on-site certified personal trainers with college-level research experience were recruited to implement the second phase of the study. Both personal trainers participated in a three-hour accredited on-boarding course. In the course, details of the study design were reviewed, including how to execute the exercise protocol with little to no coaching on the True Alpine Runner, as well as the difference in running a study versus coaching a personal training session and the importance of maintaining absolute confidentiality until the end of the study, including the data analysis phase and presentation of this white paper. When executing the treadmill portion of the protocol, personal trainers used the revised category ratio BORG Rating of Perceived Exertion Scale.

1 - 10 Borg Rating of Perceived Exertion Scale	
0	Rest
1	Really Easy
2	Easy
3	Moderate
4	Sort of Hard
5	Hard
6	
7	Really Hard
8	
9	Really, Really, Hard
10	Maximal: Just like my hardest race

Personal trainers instructed participants on how to use the treadmill and how to perform the exercises in the protocol. During all active periods, participants were instructed to work at a 7–8 level of exertion. They were instructed to not hold onto the treadmill at any point during the exercise. Participants were instructed to vary intensity by their method of choice as long as they maintained a 7–8 rating of perceived exertion on the revised category ratio BORG Rating of Perceived Exertion Scale and did not hold on to any part of the treadmill.

Each session was designed with two participants per hour to one personal trainer. Twelve total participants (six groups) were assigned to the control group and 12 total participants (six groups) were assigned to the True Alpine Runner group. Personal trainers brought the revised category ratio BORG Rating of Perceived Exertion Scale to every training session. Sessions were planned so that the control group and the True Alpine Runner participants were on site at different times.

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PRACTICE RESPONSE:

You may choose to vary intensity how you prefer as long as you are working at a 7/8 rating of perceived exertion and as long as you do not hold on to any part of the treadmill.

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the LAB

Study Training, Participant Resource

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## Research Questions

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Data was collected and analyzed for statistical significance to try to answer the following questions:

- (1) Are there statistical differences in the resting metabolism (VO<sub>2</sub> at rest) and/or metabolic profile of the True Alpine Runner group and the control group at the end of the six-week protocol?
- (2) Are there statistical differences in body composition in the True Alpine Runner group and the control group at the end of the six-week protocol?
- (3) Do users of the True Alpine Runner self-select speeds that elicit greater distances and therefore greater caloric expenditure for the same total hours of use?
- (4) Does the True Alpine Runner get more hours of use during the same period of time than a similarly placed conventional treadmill?

# Findings

## SIX-WEEK GUIDED WORKOUT PROTOCOL

Testing was administered prior to the start of the six-week protocol and immediately following the six-week protocol. Data was collected in order to determine if there were statistical differences in the resting metabolism (VO<sub>2</sub>) and/or metabolic profile and body composition changes between the True Alpine Runner group and the control group.

Statistically significant changes in resting VO<sub>2</sub> were evidenced by an increase in resting metabolic rate (RMR). Improved metabolic profile was evidenced by an increase in percent contribution from fat at rest and decreased contribution from carbohydrate. Statistically significant changes in body composition were evidenced by decreased arm circumference (inches), decreased arm fat (millimeters), decreased abdominal circumference (inches), and/or decreased abdominal fat (millimeters). Three individuals did not complete the entire protocol so were removed from the final data analysis.

### RESTING METABOLIC RATE

RMR was measured using the medical-grade PNOE device (seen left). Initial raw data suggested improvement in RMR, as evidenced in slight increases in total daily energy equivalent. Using a paired t-test, pre- and post-protocol data were compared to see if these changes were statistically significant.

Final p-value for the control group was greater than 0.05 (5%) (value = 0.0614), so the RMR difference between the initial and final situation of the control group was not significant.

#### Final Participants

Control	10
Experimental	11
Total	21



PNOE Metabolic Device

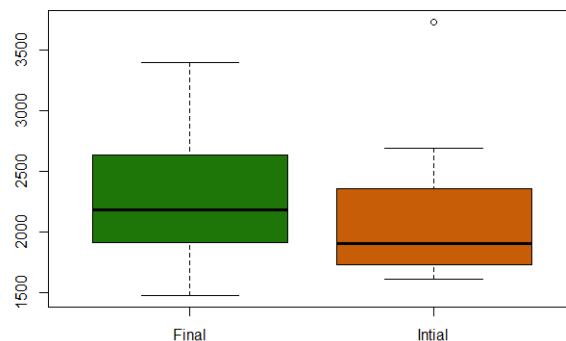


Figure 1.0.  
RMR  
Changes,  
Control  
Group

Final p-value for the True Alpine Runner group was greater than 0.05 (5%) (value = 0.2802), so the RMR difference between the initial and final situation of the experimental group was not significant.

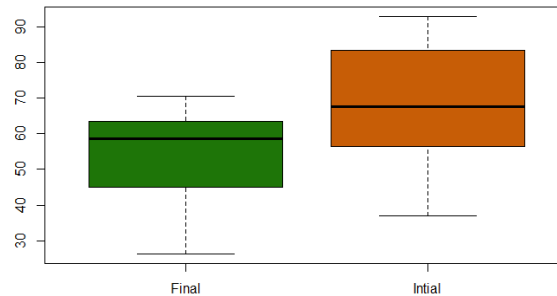


Figure 2.0  
RMR Changes,  
True Alpine  
Runner Group

Although initial data suggested a positive trend in both groups, neither group showed statistically significant improvements in RMR. According to the National Strength and Conditioning Association, it is uncommon to experience statistically significant changes in resting metabolic rate within a six-week time frame, so these findings were expected.

#### METABOLIC PROFILE

While increases in RMR are uncommon in a six-week intervention, increased contribution from fat and decreased contribution from carbohydrate to resting metabolism suggests an improvement in metabolic efficiency. Metabolic efficiency is a significant indicator for fat burning potential and weight loss. Percent contribution from fat and carbohydrate at rest were measured using the medical-grade PNOE device. Using a paired t-test, pre and post data were compared to determine improvements in the metabolic profile and if those improvements were statistically significant.

Data from the metabolic device populated a central dashboard. Percent fat contribution and percent carbohydrate contribution were analyzed.



Measurement	Average Statistics
Status <span style="color: green;">✔</span> Closed	Fat 39.4 %
Date 10/4/2018, 1:51:04 PM	Carbs 60.6 %
Duration 6' (44 breaths)	RER 0.88
Protocol	EE 1.6 kcal/min
Device PNOE 122	EE 2360 kcal/day
Calibration Time -	

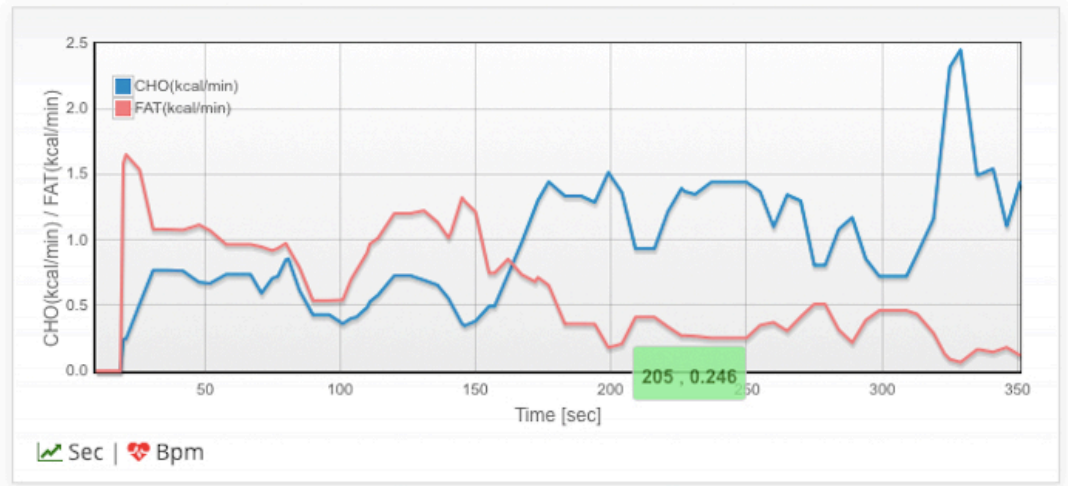
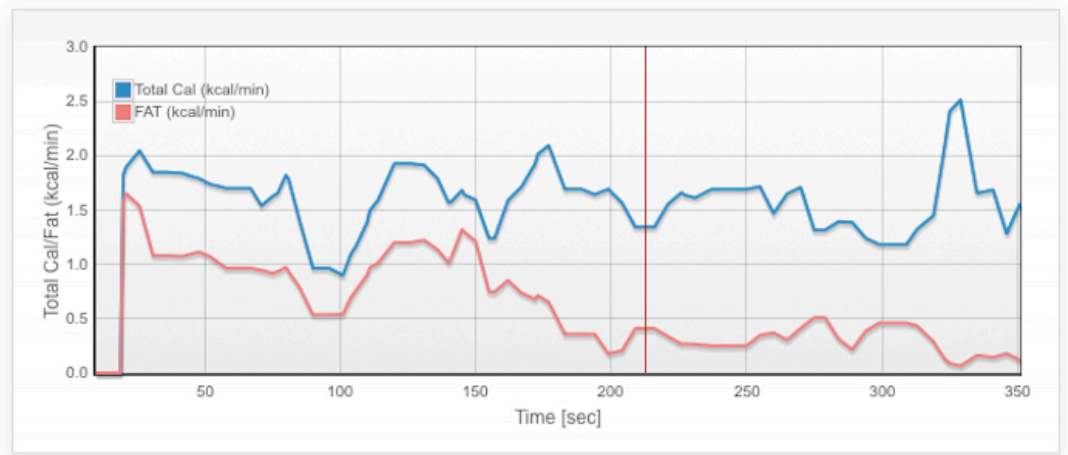


Figure 3.0. Sample Data from Initial Data Set

Final p-value for the control group was greater than 0.05 (5%) (value = 0.1436), so the percent fat difference between the initial and final situation of the control group was not significant.

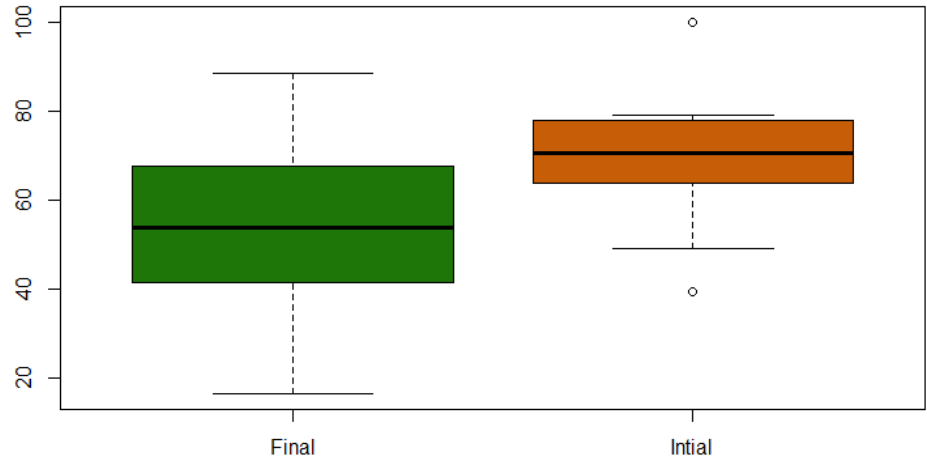


Figure 4.0. Percent Fat Contribution, Control Group

Final p-value for the True Alpine Runner group (experimental) was less than 0.05 (5%) (value = 0.03181), so the percent fat difference between the initial and final situation of the control group was significant.

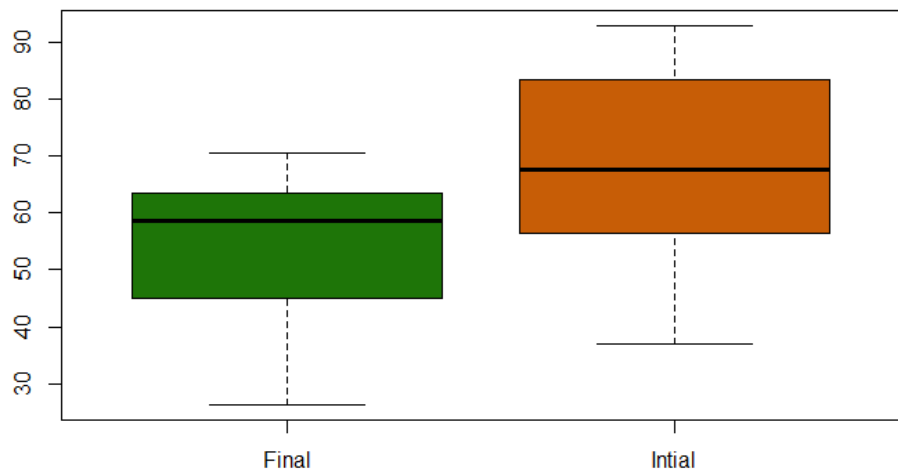


Figure 5.0. Percent Fat Contribution, True Alpine Runner Group (Experimental)

Congruent with these findings were statistically significant decreases in contribution from carbohydrate at rest in the True Alpine Runner group (experimental) as compared to the control group. These findings suggest that the True Alpine Runner was more effective than a conventional treadmill at improving metabolic profile and therefore more effective at burning fat.

### BODY COMPOSITION

In order to determine changes in body composition, measurements of arm circumference (inches), arm fat (millimeters), abdominal circumference (inches), and abdominal fat (millimeters) were taken prior to the six-week protocol and immediately following the six-week protocol. Using a paired t-test, pre and post data were compared to see if changes were statistically significant. Statistically significant changes were observed in body composition, as evidenced in decreased arm circumference, decreased arm fat, decreased abdominal circumference, and/or decreased abdominal fat.

The p-value = 0.004 is less than 0.05 (5%), so the arm circumference (in inches) difference between the initial and final situation of the control group is significant.

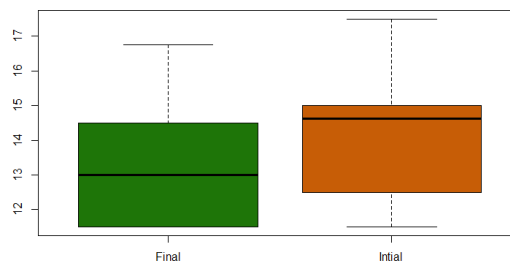


Figure 6.0. Arm Circumference, Control Group

The p-value = 0.004 is less than 0.05 (5%), so the arm circumference difference between the initial and final situation of the True Alpine Runner group is significant.

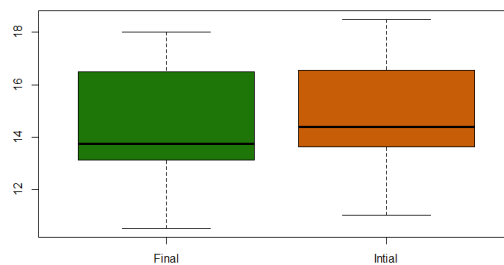


Figure 7.0. Arm Circumference, Experimental Group

The p-value = 0.2809 is greater than 0.05 (5%), so the arm fat (in millimeters) difference between the initial and final situation of the control group is not significant.

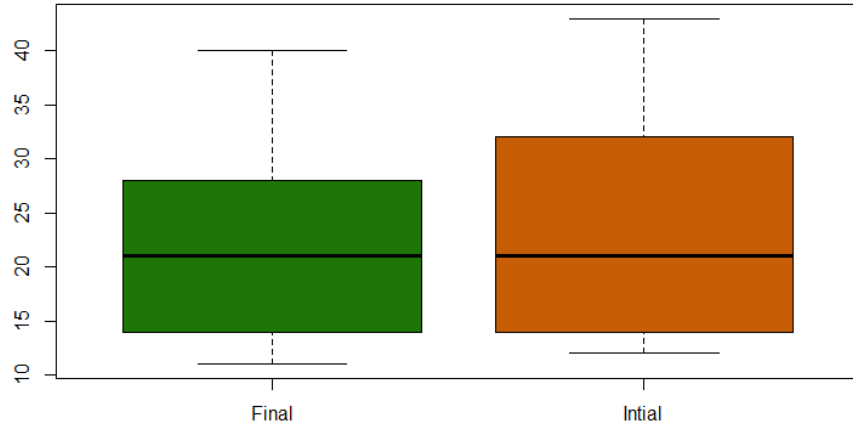


Figure 8.0. Arm Fat, Control Group

The p-value of 0.1329 is greater than 0.05 (5%), so the arm fat difference between the initial and final situation of the True Alpine Runner group is not significant.

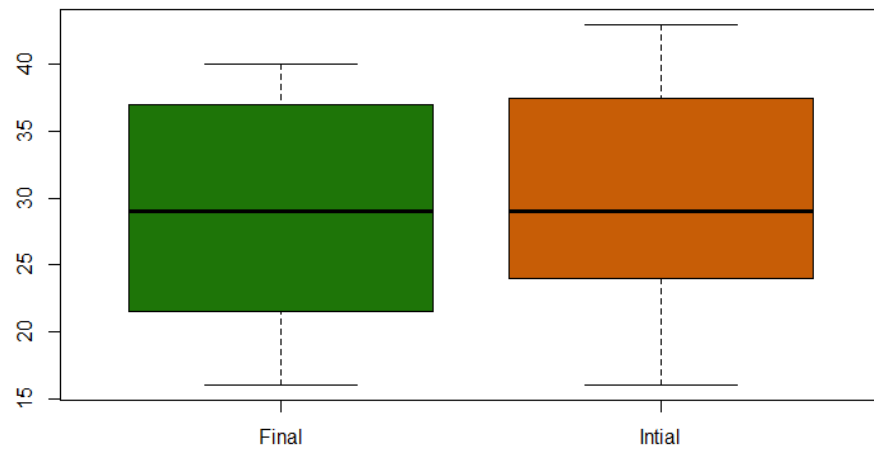


Figure 9.0. Arm Fat, Experimental Group

The p-value=0.9878 is greater than 0.05 (5%), so the abdominal circumference (inches) difference between the initial and final situation of the control group is not significant.

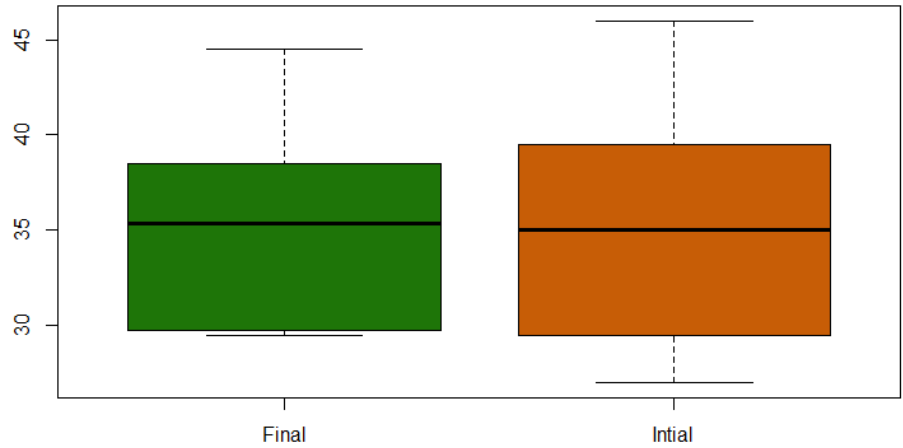


Figure 10.0. Abdominal Circumference, Control Group

The p-value=0.007 is less than 0.05 (5%), so the abdominal circumference (inches) difference between the initial and final situation of the True Alpine Runner group (experimental) group is significant.

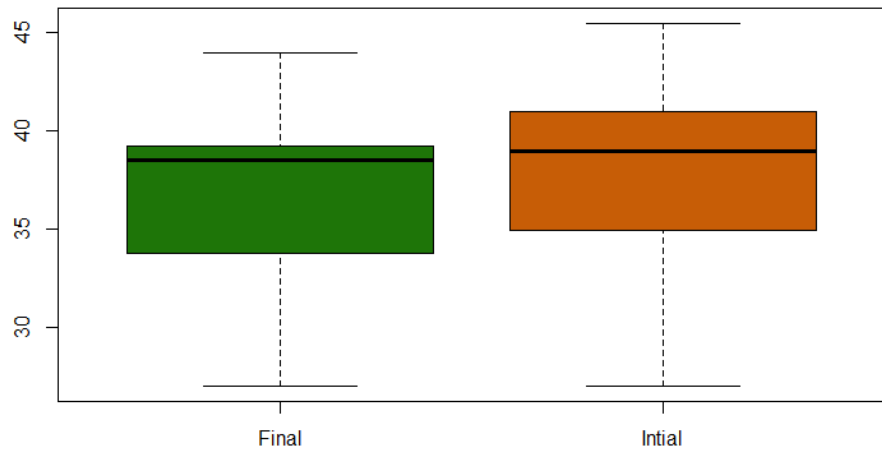


Figure 11.0. Abdominal Circumference, Experimental Group

The p-value=0.07106 is greater than 0.05 (5%), so the abdominal fat (in millimeters) difference between the initial and final situation of the control group is not significant.

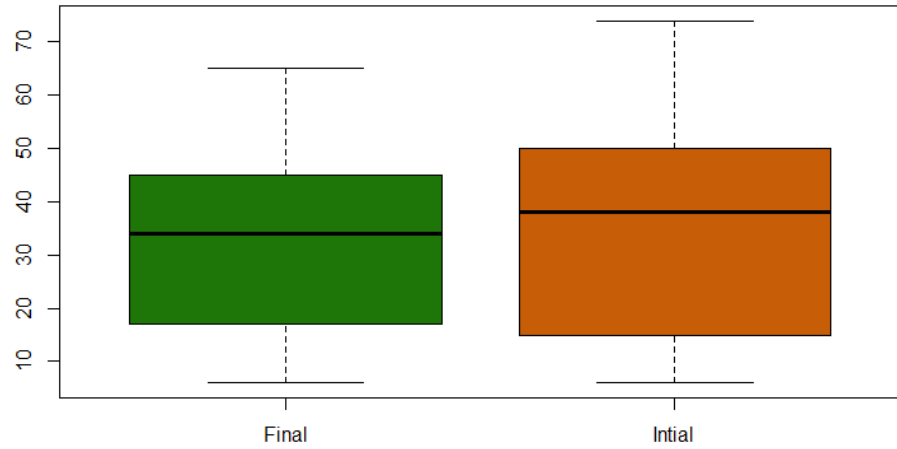


Figure 12.0. Abdominal Fat, Control Group

The p-value=0.07106 is greater than 0.05 (5%), so the abdominal fat (in millimeters) difference between the initial and final situation of the True Alpine Runner group is not significant.

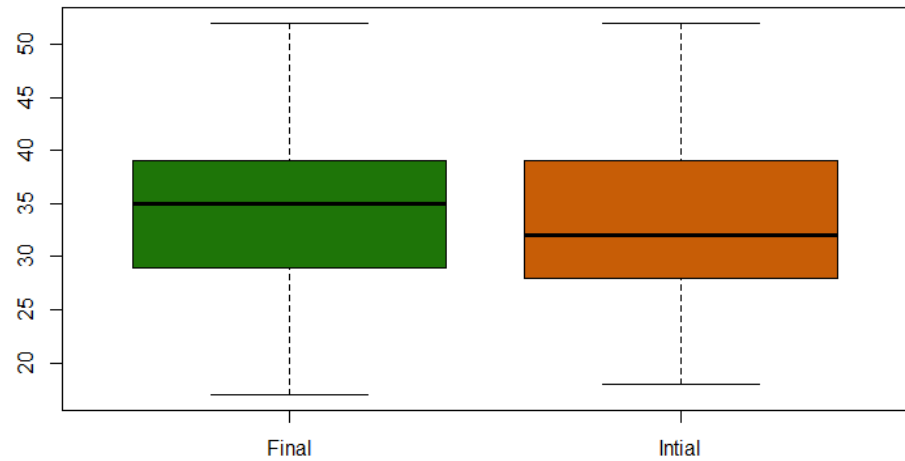


Figure 13.0. Abdominal Fat, Experimental Group

SUMMARY OF FINDINGS FOR SIX-WEEK GUIDED WORKOUT PROTOCOL

<i>Resting Metabolic Rate</i>		
<i>RMR Control</i>	0.0614	Not significant
<i>RMR Experimental</i>	0.2802	Not significant (although trending)
<i>Metabolic Profile</i>		
<i>% Fat Contribution to RMR Control</i>	0.1436	Not significant
<i>% Fat Contribution to RMR Experimental</i>	0.03181	Significant
<i>% Carbohydrate Contribution to RMR Control</i>	0.1436	Not significant
<i>% Carbohydrate Contribution to RMR Experimental</i>	0.03209	Significant
<i>Body Composition</i>		
<i>Arm Circumference (Inches) Control</i>	0.004	Significant
<i>Arm Circumference (Inches) Experimental</i>	0.004	Significant
<i>Arm Fat (Millimeters) Control</i>	0.2809	Not significant
<i>Arm Fat (Millimeters) Experimental</i>	0.1329	Not significant
<i>Waist Circumference (Inches) Control</i>	0.9878	Not significant
<i>Waist Circumference (Inches) Experimental</i>	0.007	Significant
<i>Abdominal Fat (Millimeters) Control</i>	0.07106	Not significant
<i>Abdominal Fat (Millimeters) Experimental</i>	0.07106	Not significant



### HOURS AND MILEAGE

For two weeks prior to the delivery of the True Alpine Runners, data on hours of use and mileage were recorded directly from the existing treadmills that the True Alpine Runners replaced. After installation, for two weeks, hours of use and mileage were recorded directly from the True Alpine Runners in order to compare differences in use trends. Data was collected and analyzed to determine if the True Alpine Runners were used for more total hours and if users of the True Alpine Runners self-select speeds that elicit greater distances and therefore greater caloric expenditure for the same total hours of use.

Because these operations consist of comparing two paired similar groups and because the sample window is short (14 days), a Wilcoxon test was used to analyze data and determine statistical significance.

#### More Total Hours

Although initial data suggested that the True Alpine Runners were used for more total hours each day, the p-value of 0.1382 was greater than 0.05 (5%), so the difference between the number of hours used in the True Alpine Runner group and the control was not significant.

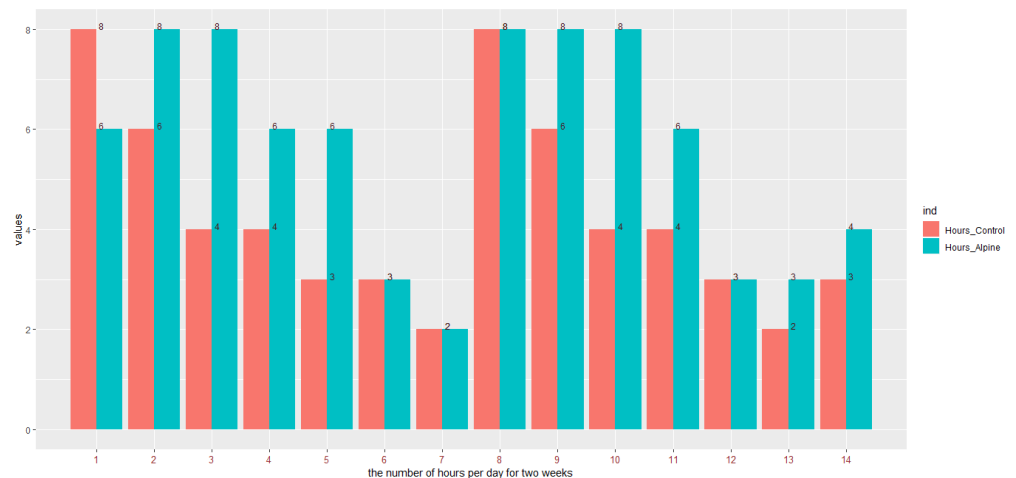


Figure 14.0. Total Hours of Use

### More Total Miles

The p-value = 0.01 is less than 0.05 (5%), so the difference between the number of miles per hour per day on the True Alpine Runner and the number of miles per hour per day on the control is significant. Put differently, when looking specifically for statistical differences in miles within each hour of use, the study showed the True Alpine Runner user self-selected speeds that accomplished more miles per hour than the control group.

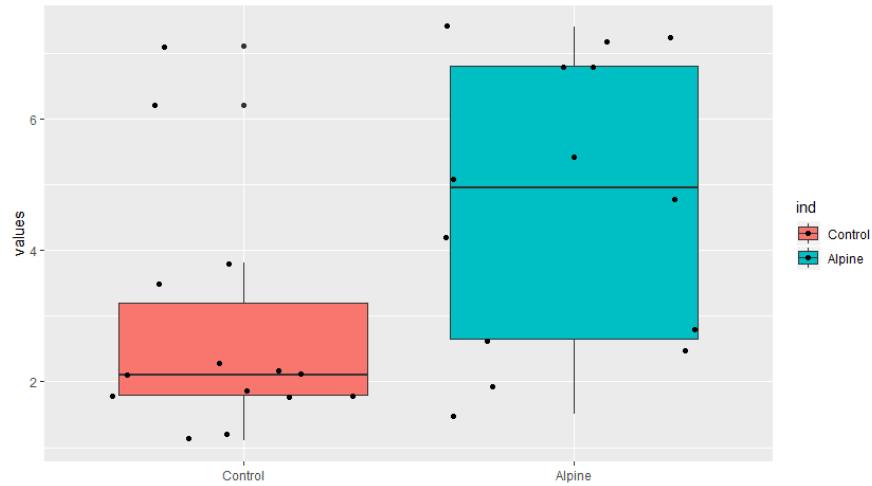


Figure 15.0. Miles Per Hour

Additionally, when comparing total mileage per day, the difference between the total of mileage per day of the True Alpine Runner users and the mileage per hour of the control group showed even greater statistical significance, with a p-value of  $2.574e-05=0.00002$ , much less than 0.05 (5%). This data suggests that the True Alpine Runner user consistently self-selects higher speeds, eliciting greater caloric output.

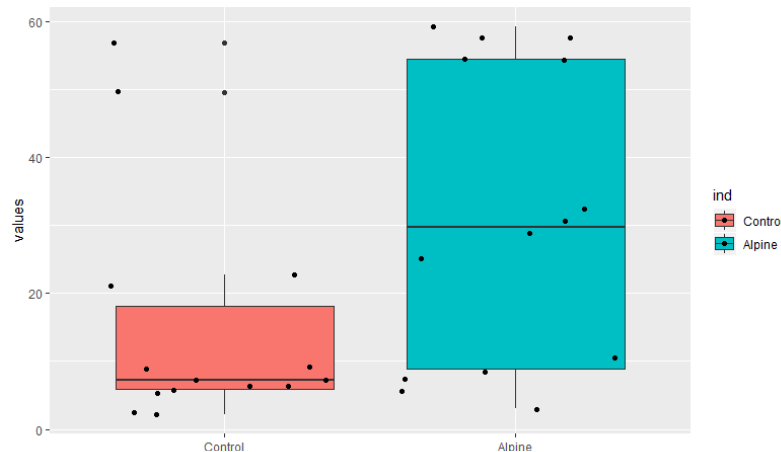


Figure 16.0. Total Mileage Over Two Weeks

SUMMARY OF FINDINGS FOR TWO-WEEK DATA ON HOURS OF USE AND MILEAGE

<i>Hours of Use</i>	4.29	5.64	Not significant
<i>Mileage Hourly</i>	2.78	4.73	Significant
<i>Mileage Daily</i>	15.06	31.09	Significant

## Discussion and Conclusion

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In having a wider variety of intensity options (-3% to 30%) and placing variable speed and variable incline/decline one-touch options central on the user dashboard, the True Alpine Runner users self-selected greater speeds that produced greater mileage than the conventional treadmills. Because the new user interface on the Ignite Console promotes variability in intensity and presents the experiences of hiking and climbing as well as walking and running, it was anticipated that users would enjoy using the Alpine Runner, resulting in longer durations of use over a two-week period. Further, by incorporating this type of variability, the intensity of the exercise would also increase. These increases in intensity led to improved metabolic profile at rest (as evidence by an overall greater percent contribution from fat). Users did self-select higher intensities for the same duration workout, the overall greater output should result in superior improvements in body composition. While improved body composition was not evidenced in this study, data was trending toward a greater improvement among the True Alpine Runner group. It is anticipated that a longer duration study would clearly show these results. These results make the True Alpine an effective, even preferred tool for individuals seeking to lose weight.

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