

The OPUS Effect: An Investigation of how Magnum OPUS may Influence Athletic Performance

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The goal of this study was to investigate the Magnum OPUS supplement in terms of its ability to enhance athletic performance and possess a tolerable safety profile. Two groups (placebo and experimental) performed a series of exercises (pushups, dips, squats, lunges) with each repetition being recorded and compared to the baseline. Upon completion of four sessions by all twenty participants, the results were scored and significant differences were noted ($t(18) = -5.41, p < 0.001, 95\% \text{ CI } [-24.25, -10.68]$). In addition, participants recorded all adverse effects experienced with the use of the supplement. It was concluded that the participants taking OPUS had a significant increase in athletic performance when compared against the placebo group. OPUS was shown to be a reasonably safe supplement that may help athletes with their training and other athletic activities.

Keywords: athletic supplement, athletic performance, beta alanine

Introduction

There are hundreds of pre-workout supplements on the market that claim to help athletes improve performance on some measurable scale. By visiting a local store or performing a quick Internet search, one can see the multitude of products available. These different products claim to do everything from helping the user gain muscle, lose weight, recover faster, get stronger, and improve their overall wellbeing¹⁹.

While these supplements are widely available, the Food and Drug Administration (FDA) do not regulate them. Therefore, most of these nutritional products do not undergo strict precautions, guidelines, and testing to evaluate the claims being made. This often results in disappointed consumers and a scarcity of supplements providing the benefits they have claimed³¹. In turn, the consumer spends increasing amounts of money trying to not only find the right product, but also finding one that is safe and effective to use.

In today's supplement industry, companies are able to put an unsafe and unproven product on the market in order to avoid the extensive time and research to scientifically test their products through clinical studies. This can lead to deceptive labeling, outlandish promises, and proprietary blends to help mask the supplement's ingredients from the consumers¹⁹. By avoiding this extra time and cost, companies are able to increase revenue and sales. However, the average consumer has no idea which companies they can trust and may potentially prey to a deceptive market¹⁹. This has created a high level of skepticism about the supplement industry and supplements themselves are often considered fake or harmful. This is not true in all cases, however the majority of the companies making these supplements do not have enough research and evidence to support the use of their products.

Magnum Nutraceuticals' OPUS was designed and developed to help athletes push further in training and exercise thus allowing them to increase strength, agility, and endurance. OPUS contains CarnoSyn® beta alanine an

essential amino acid, which works by synthesizing carnosine and acting as a precursor to nitric oxide. Carnosine functions as a buffer to maintain optimal muscular pH while nitric oxide is a vasodilator increasing blood flow to skeletal muscle²². In addition to blood flow, the skeletal muscle is also supplied with an increase of nutrients and oxygen. These properties encourage a favorable environment that supports muscle function and growth. While having these effects, beta alanine has shown few side effects and maintains a tolerable safety profile. Because beta alanine is an amino acid, and normally found in the human body, it is safe for use in normal amounts. The only adverse effects known to date is that of flushing and paresthesia, which is a result of the vasodilator properties of the supplement. This side effect occurred more commonly when beta alanine was given in high doses. This adverse effect, however, disappeared within 1 hour after ingestion¹ and appears self limiting. A full list of active ingredients can be seen in Figure 1. This study will experiment with OPUS in a variety of athletes in an effort to provide evidence on how much it can really improve athletic performance. The null hypothesis is that the intervention group will have an increase of athletic performance when compared to the placebo group.

Methods

Participants

There were twenty participants, both male and female, recruited for this study. Each participant was over the age of 18 and either currently attending Wingate University or from the surrounding area of Wingate, North Carolina. The participants were obtained from a series of school emails that were sent to the student body seeking those who regularly competed in athletics to volunteer for this study. To be considered, selected participants had to be involved in at least two sports. Exclusion criteria involved any history of significant injury or medical issue that would prevent them from taking part in the selected exercises.

Suggested use: Under 130lbs: Take 1 scoop daily 5 - 15 minutes prior to training. Over 130lbs: Take 2 scoops daily 5 - 15 minutes prior to training.
Directions: Mix 1 - 2 scoops in 12 - 16oz of water.

Supplement Facts


Per 1 level scoop (8.5g) / Scoops per container: 48

	ONE SCOOP	% Daily Value	TWO SCOOPS	% Daily Value
Calories	2.0		4.0	
Total Carbohydrate	0.0g	0.0%	0.0g	0.0%
Calcium	272.2mg	25.0%	544.4mg	50.0%
Sodium	190.0mg	8.0%	380.0mg	16.0%
Potassium	15.0mg	1.0%	30.0mg	2.0%
Instabolic pHuel™	7250mg	†	14500mg	†
Instantized L-Leucine Instantized CarnoSyn® Beta Alanine Instantized L-Citrulline Malate Instantized Glycine Instantized Calcium Bicarbonate Instantized Sodium Bicarbonate				
Opus Hydrating Energy Blitz™				
Citric Acid	50mg	†	100mg	†
Alpha Ketoglutarate	50mg	†	100mg	†
Malic Acid	50mg	†	100mg	†
Fumaric Acid	50mg	†	100mg	†
Succinic Acid	50mg	†	100mg	†
Sodium Phosphate	19.38mg	†	38.76mg	†
Potassium Phosphate	13.47mg	†	26.94mg	†
Pyridoxine (Vit B6)	5mg	250%	10mg	500%
Dicalcium Phosphate	3mg	†	6mg	†
Pantothenic Acid (Vit B5)	2.5mg	42%	5mg	84%
Magnesium Phosphate	1mg	†	2mg	†
Thiamine (Vit B1)	0.7mg	47%	1.4mg	94%
Riboflavin (Vit B2)	0.25mg	15%	0.5mg	30%
Cyanocobalamin (Vit B12)	0.5mcg	83%	1mcg	166%

* Percent Daily Values are based on a 2,000 calorie diet.
† Daily Value not established

Product also contains:
Natural Blueberry Flavor, Natural Raspberry Flavor, Silicon Dioxide,
Calcium Silicate, Sucralose, Citric Acid, Yellow color (FD&C Yellow No. 5).

MADE IN CANADA



MANUFACTURED FOR AND DISTRIBUTED BY:
MAGNUM NUTRACEUTICALS INC.
WHITE ROCK, BC, CANADA

TEL: 1.888.6.MAGNUM

Figure 1. Supplemental label of Magnum *OPUS*

The participants were informed that this research project was being used to collect data and information on the supplement *OPUS* and how it could influence athletic performance. All personal information regarding the participants will be kept confidential and will not be released to the public.

Design

This study used a between subject experimental design that was also double-blinded. The independent variable consisted of the participant receiving the intervention (*OPUS*) or the placebo. The dependent variable was the average increase of repetition performed during each session. Overall increase in athletic performance was defined as the percentage change from baseline when all repetitions from each type of exercise were averaged for each participant. The placebo group (N=10) combined with the *OPUS* group (N=10) gave a total number of 20 participants involved (Figure 2). The Wingate University research review board approved this study.

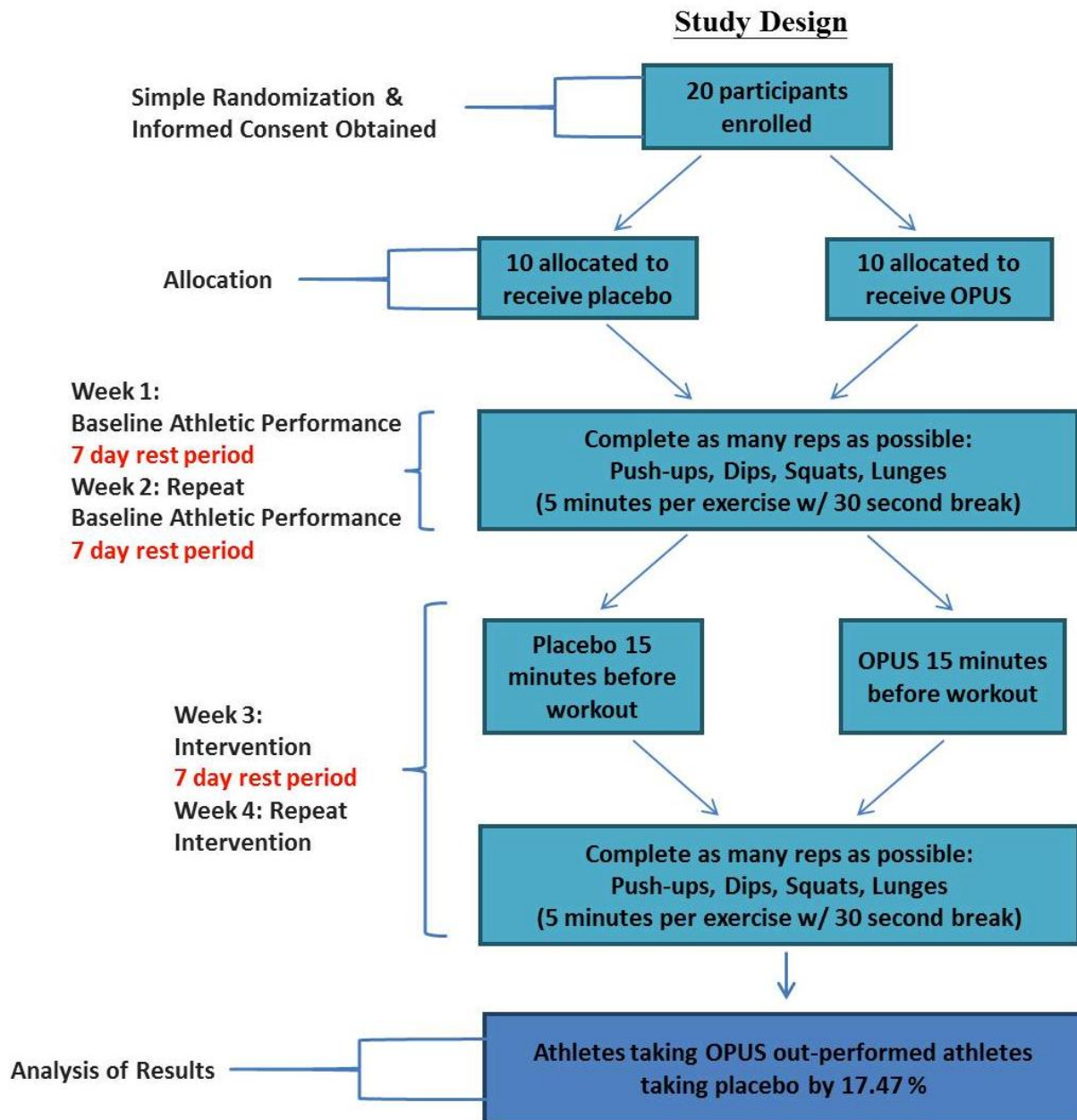
Materials

The supplement *OPUS* and the Placebo were both provided by Magnum Nutraceuticals. When *OPUS* reacts with water, it produces an effervescent effect, which turns the water into a green solution releasing the active ingredients. Provision of *OPUS* 15 minutes before activity was chosen according to recommendation by the manufacturer. The placebo was constructed with these same properties as to react

substantially similar to the intervention and protect the integrity of the study. A brief survey was also developed by the researcher to help collect the opinions of the participants in regards to *OPUS* as well as to assist with the collection of exercise repetitions (Figure 3). The survey used an ordinal scale in which participants ranked the supplement based on safety and efficacy. The mean age of the participants involved was 23.55 years old. The placebo group had an average age of 23.6 years old while the intervention group had an average age of 23.50 years old.

Procedures

After informed consent was received from all twenty participants, they were categorized into groups using simple randomization. All participants were instructed that they would individually meet with a researcher during four exercise sessions that were separated by seven days of rest. The participants were asked to resume any daily activity, as they normally would while taking part in the study. There were four different exercises using the participants' own body weight (pushups, dips, squats, and lunges) and they were given five minutes per each exercise to complete as many repetitions as they could. There was a thirty-second rest period between each exercise. These activities and lengths of duration were chosen due to the proposed mechanism of beta alanine.

Figure 2. Patient allocation, procedure, and time to analysis of *OPUS* trial

The greatest effects of increased buffering capacity are observed in activities that produce a high amount of lactic acidosis. This is seen in activities lasting from 60 second to 5 minutes especially during exercises that work the same muscle groups and induce fatigue¹. In addition, these activities were chosen based upon their lack of necessary training or advanced level of athleticism to perform them. All repetitions were recorded. A 30 second break was provided to allow participants to rest without having time to completely recover²⁵. The first two sessions served as the participant's baseline and for the final two sessions the participant was introduced to the interventions.

The reason these four particular exercises were selected was because pushups with dips and squats with

lunges all work similar muscle groups. If these exercises are repeated as they were during the study then it is likely that the participant experienced a burnout period, meaning the muscle groups would be exhausted, thus resulting in a failed repetition. This would help measure the claim of *OPUS* as it promises to increase athletic performance through the delay of muscle fatigue.

During the final two sessions, the ten participants in the *OPUS* group were given two scoops of the supplement mixed with 12oz of water as instructed by the manufacturer. After waiting 15-minutes (allowing time for the supplement to be systemically absorbed as claimed by the manufacturer), the participant was then asked to complete the four exercises as they have previously done the prior weeks. This set of data

was collected and compared with their baseline numbers. During the final two sessions, the ten participants in the Placebo group were given two scoops of the Placebo mixed with 12oz of water. These participants also had a 15-minute wait time before engaging in the four exercises.

Four-trained doctorate students from Wingate University School of Pharmacy conducted the individual sessions of the participants. Each trained student acted as a research assistant and individually led a group of five participants. This utilized a double blind design because the lead investigator was now able to blind each assistant while they administered either the placebo or OPUS to the participants.

At the conclusion of the final session, participants were asked to answer a survey that collected their opinions of OPUS. Each participant answered the survey under the impression that they had received the supplement. However, only the data collected from participants that had actually received the supplement (not placebo) were used. A five-point scale was used with five being the highest agreeability and one being the lowest. The questions were as follows: 1-I believe that OPUS has improved my overall athletic ability; 2-I would recommend OPUS to other athletes; 3-I believe that OPUS improved my overall energy level; and 4-I felt OPUS was reasonably safe to use. In addition to the survey responses, the participants were asked to list their opinion regarding OPUS as well as about the sports they were involved in.

Statistical analysis

All data was collected, measured and scored by the student researchers involved. An independent t-test was used to conclude if there was a difference between primary endpoint of the OPUS group and the placebo group. The primary endpoint was an average change of all activities therefore only two variables were used. An alpha of 0.05 was set to determine significance between the two independent continuous variables.

Results

Statistical analysis was performed to conclude if the increase in athletic performance recorded was due to the supplement OPUS, $t(18) = -5.41$, $p < 0.001$, 95% CI [-24.25, -10.68]. The data was concluded statistically significant and thus the null hypothesis was rejected. All participants that took OPUS experienced an increase in athletic performance. The highest was participant #1 who had an increase of 32.95% and the lowest was participant #15 with 4.97%. These percentages show the change when all repetitions from each exercise were averaged at both baseline and at intervention. The average increase of athletic performance was 17.60% for participants taking OPUS. The participants that took the Placebo had only an average increase of 0.13%. The highest performance experienced was 10.26% by participant #8 while the lowest was a decrease in athletic performance by participant #10 of -12.46%. Those that took OPUS outperformed the Placebo group by 17.47%. The standard deviation for the Placebo group was 6.23. The standard deviation for the OPUS group was 8.08. Additional differences between groups and for each particular type of exercise can be seen in Table 1. The

opinion survey was completed on the final session and was averaged across participants that received OPUS: I felt OPUS was reasonably safe to use (4.8/5); I felt OPUS increased my overall energy levels (4/5); I would recommend OPUS to other athletes (3.4/5); and I felt OPUS improved my overall athletic ability (3.6/5). From the ten participants that took OPUS the following adverse reactions were reported: Pruritus (4/10), Dyspepsia (3/10), Eructation (2/10), and None (2/10). Pruritus was likely caused by the beta alanine, as skin sensations are the most commonly reported adverse effect. Dyspepsia and eructation were reported in some of the participants taking OPUS and were potentially due to the effervescent properties of the supplement. When comparing beta alanine to other popular supplements on the market, the incidence of serious adverse effects is much smaller. For example, creatinine supplementation has reports of muscle cramping (25%), gastrointestinal pain, nausea, diarrhea, weight gain, and rare incidences of renal dysfunction while dimethylamylamine supplementation has serious risks of cardiovascular events²². While OPUS did have reports of adverse effects, no participants discontinued the trial due to these occurrences.

Discussion

The purpose of this research project was to examine the claim from Magnum Nutraceuticals in regards to their new sports supplement OPUS. Magnum Nutraceuticals reports that this product will increase athletic performance and this study will test this notion in athletes during repetitive exercises.

Previous studies have shown that supplementation may have varying effects in individuals based on a number of characteristics or habits including ingestion timing, mode of ingestion, and type of activities performed¹³. Therefore, consumers may have to experiment with several manufacturers and products before identifying the one that works best for them¹⁹. While OPUS may not be the product for everyone, this study may suggest that the product could help increase athletic performance during repetitive exercises for the selected population.

This study has a number of limitations that are summarized below. Due to limited resources, the sample size only included twenty participants. Future research should be done with a larger sample size to see if results are duplicated. This research should also include a third arm (control, placebo, OPUS) trial. The data showed a difference in means when comparing the Placebo versus the OPUS group. This could be due to many factors including the lack of stratification among groups. There were no baseline characteristics describing the normal activity levels or supplement-use history of each of the participants. The results could be due to natural improvement in athletic performance as a result of exercise performed during weekly assessments as opposed to the actual benefit from the supplement in participants that have less experience with these types of activities.

This study provides statistically significant data suggesting that OPUS can help athletes increase athletic performance during repetitive exercises. With further research containing larger sample sizes, more conclusions can be made as to the clinical applications of this supplement.

Table 1. Results from OPUS users including overall percent change from baseline and percent changes for each particular exercise

Participant #	Baseline averages	OPUS averages	% Change	Conclusion
1 (25 y/o Male)	Push-ups: 88.5 Dips: 72 Squats: 133.5 Lunges: 124.5	Push-ups: 112.5 Dips: 110.5 Squats: 181 Lunges: 144	Push-ups: ↑27.11% Dips: ↑53.47% Squats: ↑35.58% Lunges: ↑15.66%	OPUS <u>increased</u> overall athletic performance 32.95%
2 (20 y/o Female)	Push-ups: 90 Dips: 65.5 Squats: 127.5 Lunges: 104	Push-ups: 95.5 Dips: 111 Squats: 168.5 Lunges: 114.5	Push-ups: ↑6.11% Dips: ↑69.46% Squats: ↑32.15% Lunges: ↑10.09%	OPUS <u>increased</u> overall athletic performance 29.45%
3 (22 y/o Female)	Push-ups: 108.5 Dips: 116.5 Squats: 197.5 Lunges: 152.5	Push-ups: 122 Dips: 150 Squats: 216 Lunges: 158	Push-ups: ↑12.44% Dips: ↑28.75% Squats: ↑9.36% Lunges: ↑3.60%	OPUS <u>increased</u> overall athletic performance 13.53%
4 (25 y/o Male)	Push-ups: 48 Dips: 53 Squats: 91.5 Lunges: 118	Push-ups: 49.5 Dips: 62.5 Squats: 116.6 Lunges: 121	Push-ups: ↑3.12% Dips: ↑17.92% Squats: ↑27.32% Lunges: ↑2.54%	OPUS <u>increased</u> overall athletic performance 12.72%
5 (25 y/o Male)	Push-ups: 65.5 Dips: 75.5 Squats: 105.5 Lunges: 87	Push-ups: 69.5 Dips: 90 Squats: 125.5 Lunges: 100	Push-ups: ↑6.10% Dips: ↑19.20% Squats: ↑18.95% Lunges: ↑14.94%	OPUS <u>increased</u> overall athletic performance 14.79%
11 (22 y/o Male)	Push-ups: 91 Dips: 72.5 Squats: 140.5 Lunges: 126.5	Push-ups: 96.5 Dips: 104 Squats: 167 Lunges: 120	Push-ups: ↑6.04% Dips: ↑43.44% Squats: ↑18.86% Lunges: ↓5.13%	OPUS <u>increased</u> overall athletic performance 15.80%
12 (21 y/o Male)	Push-ups: 130 Dips: 107 Squats: 113 Lunges: 103	Push-ups: 140 Dips: 137.5 Squats: 141.5 Lunges: 107.5	Push-ups: ↑7.69% Dips: ↑28.50% Squats: ↑25.22% Lunges: ↑4.36%	OPUS <u>increased</u> overall athletic performance 16.44%
13 (24 y/o Male)	Push-ups: 117.5 Dips: 83 Squats: 74.5 Lunges: 53.5	Push-ups: 127.5 Dips: 94 Squats: 102.5 Lunges: 60.5	Push-ups: ↑8.51% Dips: ↑13.25% Squats: ↑37.58% Lunges: ↑13.08%	OPUS <u>increased</u> overall athletic performance 18.10%
14 (25 y/o Male)	Push-ups: 122.5 Dips: 71.5 Squats: 76 Lunges: 63.5	Push-ups: 137.5 Dips: 81.5 Squats: 92.5 Lunges: 77	Push-ups: ↑12.24% Dips: ↑13.98% Squats: ↑21.71% Lunges: ↑21.25%	OPUS <u>increased</u> overall athletic performance 17.29%
15 (26 y/o Male)	Push-ups: 79.5 Dips: 70 Squats: 81 Lunges: 85.5	Push-ups: 69 Dips: 72.5 Squats: 94.5 Lunges: 96.5	Push-ups: ↓13.20% Dips: ↑3.57% Squats: ↑16.66% Lunges: ↑12.86%	OPUS <u>increased</u> overall athletic performance 4.97%

Table 2. Results from Placebo group including overall percentage change from baseline and percent changes for each particular exercise

Participant #	Baseline averages	Placebo averages	% Change	Conclusion
6 (28 y/o Male)	Push-ups: 67	Push-ups: 69	Push-ups: ↑2.98%	Placebo decreased overall athletic performance 1.14%
	Dips: 73.5	Dips: 74	Dips: ↑0.68%	
	Squats: 91.5	Squats: 88.5	Squats: ↓3.27%	
	Lunges: 93	Lunges: 90.5	Lunges: ↓2.68%	
7 (25 y/o Male)	Push-ups: 37	Push-ups: 35.5	Push-ups: ↓4.05%	Placebo increased overall athletic performance 1.35%
	Dips: 53	Dips: 54	Dips: ↑1.88%	
	Squats: 68.5	Squats: 78	Squats: ↑13.86%	
	Lunges: 87	Lunges: 78	Lunges: ↓10.34%	
8 (24 y/o Female)	Push-ups: 65.5	Push-ups: 74.5	Push-ups: ↑13.74%	Placebo increased overall athletic performance 10.26%
	Dips: 72	Dips: 87	Dips: ↑20.83%	
	Squats: 88.5	Squats: 100.5	Squats: ↑13.55%	
	Lunges: 63.5	Lunges: 59	Lunges: ↓7.08%	
9 (21 y/o Female)	Push-ups: 56.5	Push-ups: 54.5	Push-ups: ↓3.53%	Placebo decreased overall athletic performance 1.13%
	Dips: 77.5	Dips: 77	Dips: ↓0.64%	
	Squats: 93.5	Squats: 92.5	Squats: ↓1.06%	
	Lunges: 73	Lunges: 73.5	Lunges: ↑0.68%	
10 (23 y/o Female)	Push-ups: 36.5	Push-ups: 30.5	Push-ups: ↓16.43%	Placebo decreased overall athletic performance 12.46%
	Dips: 98	Dips: 88.5	Dips: ↓9.69%	
	Squats: 232.5	Squats: 178.5	Squats: ↓23.22%	
	Lunges: 94	Lunges: 93.5	Lunges: ↓0.53%	
16 (22 y/o Male)	Push-ups: 82.5	Push-ups: 81.5	Push-ups: ↓1.21%	Placebo decreased overall athletic performance 5.71%
	Dips: 82.5	Dips: 102.5	Dips: ↑24.24%	
	Squats: 89.5	Squats: 56	Squats: ↓37.43%	
	Lunges: 59	Lunges: 54	Lunges: ↓8.47%	

17 (27 y/o Male)	Push-ups: 41.5	Push-ups: 46.5	Push-ups: ↑12.04%	Placebo <u>increased</u> overall athletic performance 4.79%
	Dips: 36.5	Dips: 39	Dips: ↑6.84%	
	Squats: 92.5	Squats: 94.5	Squats: ↑2.16%	
	Lunges: 80	Lunges: 78.5	Lunges: ↓1.87%	
18 (22 y/o Female)	Push-ups: 64.5	Push-ups: 61.5	Push-ups: ↓4.65%	Placebo <u>decreased</u> overall athletic performance 1.79%
	Dips: 53.5	Dips: 54.5	Dips: ↑1.86%	
	Squats: 132.5	Squats: 134	Squats: ↑ 1.13%	
	Lunges: 104	Lunges: 102	Lunges: ↓1.92%	
19 (24 y/o Female)	Push-ups: 14	Push-ups: 17.5	Push-ups: ↑25%	Placebo <u>increased</u> overall athletic performance 3.75%
	Dips: 22	Dips: 17.5	Dips: ↓20.45%	
	Squats: 113.5	Squats: 112.5	Squats: ↓0.88%	
	Lunges: 66	Lunges: 73.5	Lunges: ↑11.36%	
20 (20 y/o Female)	Push-ups: 60	Push-ups: 56.5	Push-ups: ↓5.83%	Placebo <u>increased</u> overall athletic performance 3.45%
	Dips: 48	Dips: 58.5	Dips: ↑21.78%	
	Squats: 121	Squats: 120.5	Squats: ↓0.43%	
	Lunges: 112	Lunges: 110	Lunges: ↓1.78%	

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