Effects of Incorporating Body Weight as Resistance on Lower Body Strength

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Abstract

• EFFECTS OF INCORPORATING BODY WEIGHT AS RESISTANCE ON LOWER BODY STRENGTH

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•INTRODUCTION: Incorporating a person's own body weight as resistance is commonly used when a person is transitioning from sedentary to starting an exercise routine. In addition, incorporating one's own body weight as resistance is the most appropriate choice when the person has no experience or is afraid of incorporating weights into their exercise routine. For strength gains, resistance training also known as strength training is defined by using external weight or using the person's own body weight to increase body strength. Resistance training can be defined as progressively overloading the neuromuscular system using near maximal muscle contractions against high resistance. The safest way for beginners who want to use resistance training is to start by using their own weight as resistance and then progressively add more weight to their exercise routine.

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•PURPOSE: The purpose of this study was to compare the effects of two different exercise programs combinations using own body weight as resistance have on lower body strength.

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•METHODS: A total of eight partially active females from the University of Texas at Arlington participated in this study. Participants were divided into two programs. Program 1 (age: 21.8 ± 0.96 years, weight: 73.0 ± 23.4 kg, height: 163.2 ± 7.6 cm). Program 2 (age: 23.8 ± 4.9 years, mean weight: 61.1 ± 8.0 kg, mean height: 161.3 ± 4.4 cm). Lower body strength was measured by a one repetition maximum (1RM) load for each participant with a back squat and leg extension. This was followed by the number of repetitions the participants could perform at 75% of 1RM for back squat and leg extension. The exercise programs consisted of 12 sessions (4 weeks) of resistance training only using body weight as resistance. Program 1 consisted of calf raises and walk forward lunges. Program 2 consisted of step ups and crossover lunges. For both programs the same warm-up and cool-down exercises were utilized. At the end of the 4 weeks participant's strength was tested by 1RM back squat and leg extension and the number of repetitions by lifting 75% of 1RM of initial 1RM during the pre-test.

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•RESULTS: A significant difference was found for the back squat among the participants (1RM: p<0.006; 75% of 1RM reps: p<0.048). No significant difference was found between programs 1 and 2 from the Pre and Post-test (1RM: p=0.750; 75% of 1RM reps: p=0.829). A significant difference was found from Pre- and Post-test assessment for leg extension for 1RM among participants (p< 0.015). Results approached significance (p=0.089) for 75% of 1RM number of repetitions (p=0.069). No significant difference was found between the programs for leg extension 1RM and 75% of 1M and number of repetitions (1RM: p=0.368; 75% of 1RM reps: p=0.493).

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•CONCLUSION: The results of this study showed that there was a significant difference in lower body strength gains between the two programs for the back squat and leg extension. It was also found that the increase in repetitions at 75% of 1RM from pre to post-test for both programs was significant. There was no significant difference found between the two training programs.

Purpose

The purpose of this study was to compare the effects of two different exercise programs combinations, using one's own body weight as resistance, has on lower body strength.

Methods

Participants

• A total of eight moderately active females of the University of Texas at Arlington volunteered to participate in this study

Measurements

• 1RM back squat
• 75% of 1RM number of repetitions for back squat
• 1RM leg extension
• 75% of 1RM number of repetitions for leg extension

Experimental Design

• Six weeks intervention training exercises (1 week pre-test, 4 weeks of training, and 1 week post-test.
• Week 1, demographic data was recorded (age, weight, and height). Followed by baseline pre-test strength measurements by doing 1RM back squat and 1RM leg extension.

Methods (cont'd)

• Participants were allowed to rest and repeated at a higher load if they felt like they had not reached the maximum weight they can lift once. Then 75% of that load was calculated from their 1RM for the back squat and the leg extension individually.
• Then participants were to lift their 75% of 1RM as many repetitions as possible until they reached fatigue for the back squat and then for the leg extension.
• Four week s of training intervention took place.. The two programs met three times per week for a 30 minutes training.
• Program 1, started with 5 minutes of dynamic warm-up: walking over, walking knee lift, and airplanes. 20 of training exercise: calf raises and forward walk lunges. 5 minutes of cool-down doing static stretching : sitting toe reach, side quadriceps stretch, and the butterfly.
• Program 2, started with 5 minutes of dynamic warm-up: walking over, walking knee lift, and airplanes. 20 of training exercise: step ups and crossover lunges. 5 minutes of cool-down doing static stretching : sitting toe reach, side quadriceps stretch, and the butterfly.
• Week 6, post-test. After warm-up participants were set to previous 1RM for both back squat and leg extension. if they could lift more they strike for a new 1RM. Then participants performed at previous 75% of 1RM from the pre-test for both back squat and leg extension. The purpose of using the same 75% of 1RM was to note if participants were able to complete more repetitions during the post-test.

Results

Table 1: Program 1 Subject Data

4 Females	Mean	SD	Max	Min
Age (yrs)	21.8	±0.96	23	21
Weight (kg)	73.0	±23.4	104.5	52.3
Height (cm)	163.2	±7.6	170.2	152.4

Table 2: Program 2 Subject Data

4 Females	Mean	SD	Max	Min
Age (yrs)	23.8	±4.9	31	21
Weight (kg)	61.1	±8.0	69.0	51.8
Height (cm)	161.3	±4.4	165.1	157.5

Results (cont'd)

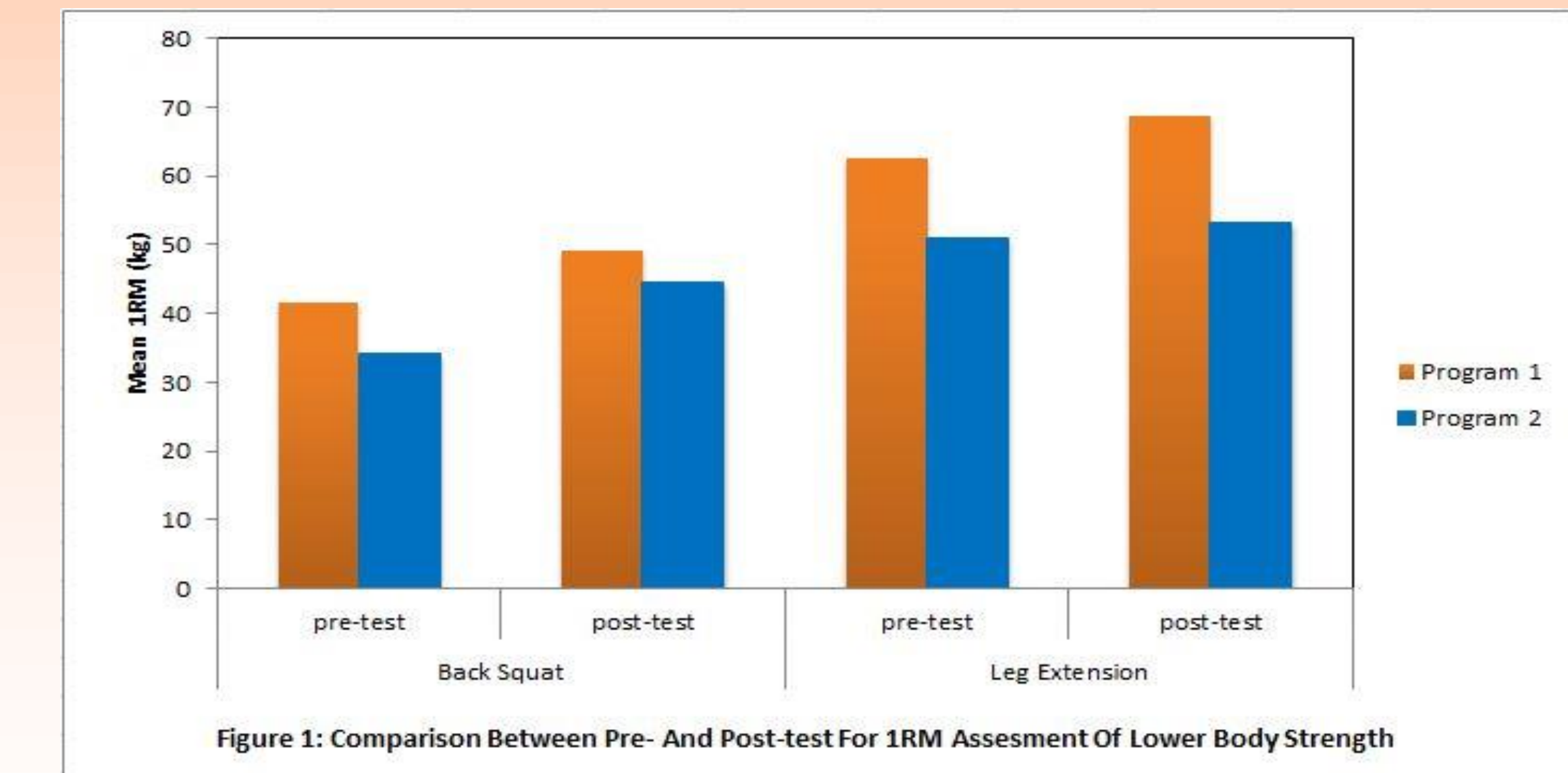Figure 1: Comparison Between Pre- And Post-test For 1RM Assesment Of Lower Body Strength

Figure 1: Strength measurements from Pre- and Post-test for a back squad 1RM and leg extension 1RM. Significant differences for strength gains were found among the participants of the two programs (Squat 1RM: p<0.006; leg 1RM: p<0.015).

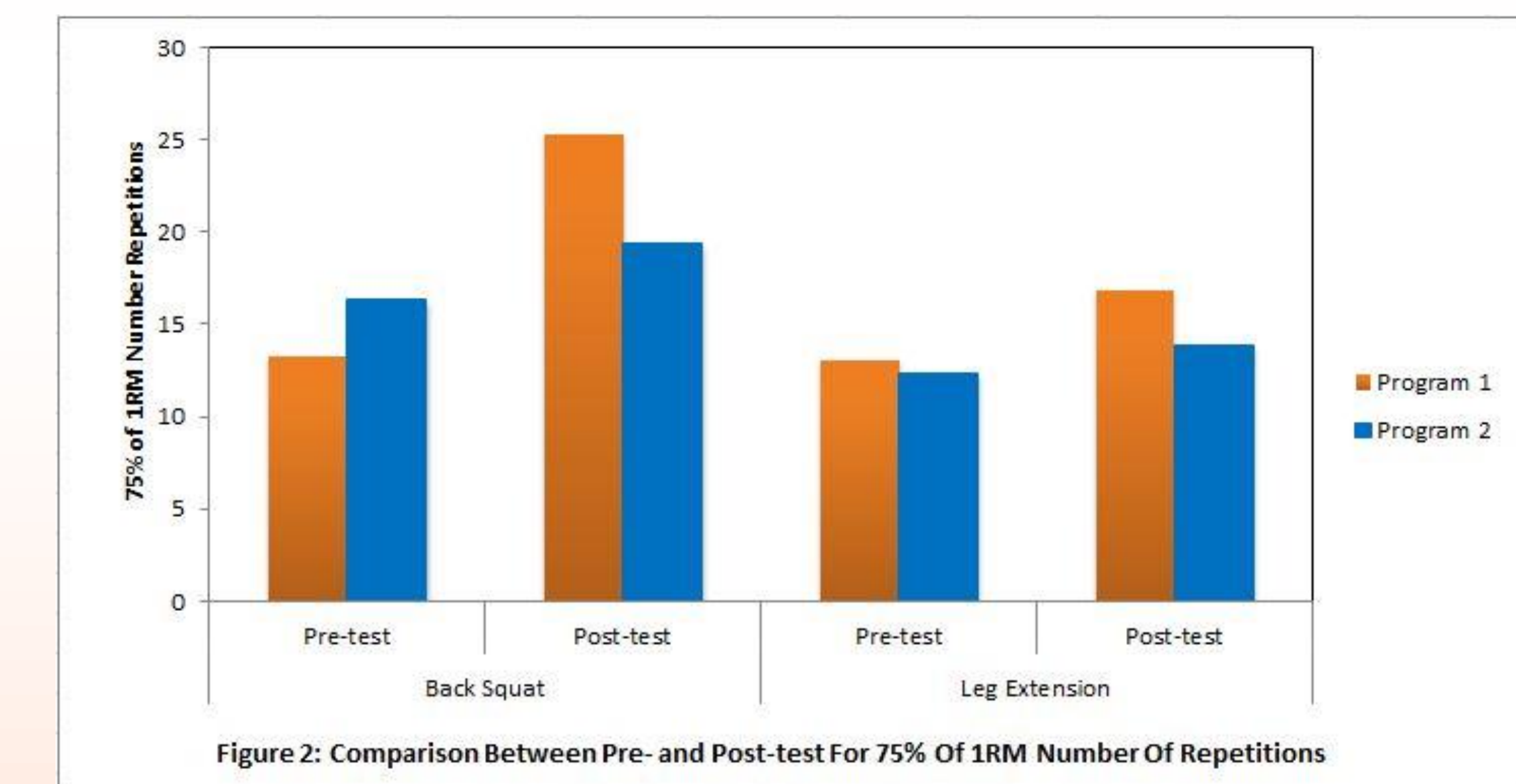Figure 2: Comparison Between Pre- and Post-test For 75% Of 1RM Number Of Repetitions

Figure 2: Strength measurements from Pre- and Post-test for a back squad 75% of 1RM number of repetitions and leg extension 75% of 1RM number of repetitions. Significant differences for the number of repetitions were found among the participants of the two programs for a back squat number of repetitions (75% of 1RM reps: p<0.048). Close to significant difference was found for leg extension number of repetitions (75% of 1RM reps: p=0.069).

Conclusions

• The results of this study showed that there was a significant difference in lower body strength gains between the two programs for the back squat and leg extension. It was also found that the increase in repetitions at 75% of 1RM from pre to post-test for both programs was significant. There was no significant difference found between the two training programs.