



Effects of Four-Week Vertical Jump Training Program to Increase Lower Body Power in Women Collegiate Rowers

EXERCISE SCIENCE
SACRED HEART UNIVERSITY

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ABSTRACT

Rowing is a sport that requires the use of the entirety of the body for each stroke, with a large portion of the movement coming from the lower body. Because each stroke occurs rapidly, lower body power is essential to achieve high performance. This exercise program was written up with the intention of increasing the lower body power of the Sacred Heart University women's rowing team. Vertical jumps are a common activity to assess lower body power, so an increase in vertical jump height would mean an increase in lower body power. Through the use of plyometrics and other lower body movements, the athletes aimed to better their jump height and power.

Power or Strength: Which is More Important for Rowers?

- Muscle strength can be defined as the amount of force a muscle can produce with one maximal effort¹
- Power is the muscle's ability to exert maximal force in a short period of time¹
- The ideal metric for high performance in rowing is time to row a set distance², so high boat velocity is desired
- Total power of the rower strongly affects the average velocity of the boat²

Why Do Rowers Need to Jump if They Compete Sitting in a Boat?

- 47% of the global power of the rowing motion comes from the lower limbs³
- Recorded jump height has been interpreted by many authors as an indicator of muscle power⁴
- Total propulsive power developed by the rowers, including that of the lower body, can be a predictor of performance of the entire crew²

PARTICIPANTS

- 25 NCAA D1 Athletes
- Gender: Female
- Sport: Rowing
- At the time of testing, all participants were healthy, regularly active, and without injury

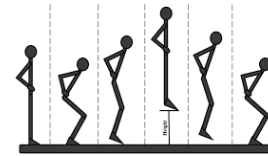
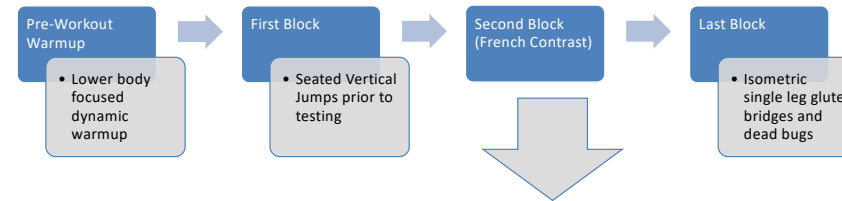


Figure 1. Phases of a Countermovement Jump

METHODS



French Contrast Block



RESULTS

- Of the 25 participants, 18 of them reached their peak jump height in the 3rd week of the program (Green bar in Tables 1 and 2)
- The greatest increase in jump height on average occurred between weeks 2 and 3 (0.785 inches) (Red and green bars, respectively in Tables 1 and 2)
- All 25 participants averaged an increase of 1.024 inches to their jump height between weeks 1 and 3 (Blue and green bars, respectively in Tables 1 and 2)
- The participants averaged a decrease of 0.396 inches between weeks 3 and 4 (Green and purple bars, respectively in Tables 1 and 2)

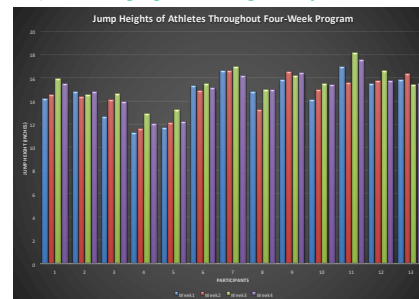


Table 1- Jump Heights of 13 of 25 Athletes for each week of the program

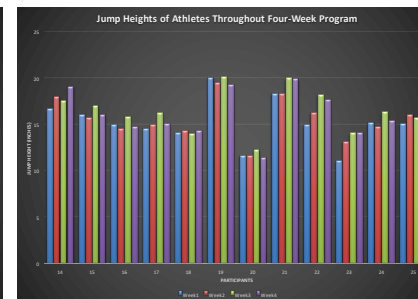


Table 2- Jump Heights of remaining 12 of 25 Athletes for each week of the program

DISCUSSION

- The program successfully increased jump height, enhancing lower body power
- The French Contrast method, comprising four exercises, demonstrated acute jump height improvement⁵
- Submaximal half squats are effective for enhancing jump height, likely due to neuromuscular activation⁶
- Weighted jumps, like dumbbell jumps, are popular for power increase⁷
- Band assisted vertical jumps, a plyometric intervention, enhance overall power output and jump height⁸
- A study by Mihalik et al. showed a significant increase in jump height with dedicated plyometric training days⁹
- Plyometrics are crucial for developing both jump height and lower body power

TAKE HOME MESSAGES

- Rowers want **power**
- Plyometric training is effective in increasing neural activation to recruit more motor units to fire simultaneously,¹⁰ leading to greater power
- Vertical jump has a direct positive correlation to lower body power¹¹

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