The Effects of an Aquatics Protocol on Leg Muscle Strength in Active Population

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Abstract

Introduction: Little research exists on using an aquatics strength training protocol as a part of a workout protocol to aid in building lower body strength in an active population (Kaneda, 2008). Pool workouts may provide an alternative modality for increasing lower body strength in not only healthy populations, but may be of importance in the sports performance area as well. The purpose of the current research is to determine the effectiveness of an 8 session, 4 week, 5-exercise lower body aquatics protocol on leg muscle strength for an active student population using Mystek accelerometer and MicroFET dynamometer.

Methods: Seven (5 M, 2 F) healthy active students aged 19.5 yrs±1.5 SD were recruited for this study and randomly split into two workout groups. The 5-exercise protocol for the aquatics group (AP) used an underwater pool protocol and the dry-land group (DP) used a dry-land protocol. Prior to the first training session, and after 4-weeks of training protocols, participants were assessed for peak leg power tested via MicroFET dynamometer and Mystek 3D accelerometer. Data was collected for adductor, abductor and hip flexor muscles. The participants were randomly assigned to an exercise protocol which they performed twice a week for 4 weeks.

Results: Independent t-tests were performed between DP and AP groups. Aquatic protocols are commonly used in the geriatric and rehabilitation populations. In both of those populations, previous research has yielded positive results, as lower body strength increased in elderly population. When evaluating before and after differences among three groups, water resistance improved isometric leg extension strength and isometric leg extension strength with a percent difference of 7.5% and 14.6%, respectively. The previous research introducing an aquatic training protocol as a part of a workout routine to aid in building strength in an active population is limited in historical evidence. In the present study, investigators based protocols on previous research findings experienced in rehabilitation populations and applied them to Bethel University active young population. The goal of this research is to determine the effectiveness of an aquatics protocol in aiding in leg muscle strength for an active student population.

Conclusion: No statistical evidence was found between AP and DP groups output in adductor, abductor and hip flexor strength. Results of the current study are likely due to a small sample size and a relatively short training program. Previous research produced positive results when conducted with a larger sample size and longer training protocol. Bocalini’s research has displayed the effectiveness of water-based training protocols for lower body strength, flexibility and maintenance. Bocalini (2008) used a sample size of N=72, for a land and aquatics group using 60 minute exercise sessions, three times a week over a 12 week span. We had time constraints for only training for 4-weeks but would consider and suggest a 12-week protocol and a greater population size.

References

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