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A comparison of variability between absolute and relative blood flow restriction pressures

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Overview

My name is Daphney Stanford and I am a first-year doctoral student with good standing in the Health and Kinesiology graduate program. For my Graduate Student Council project we plan to apply blood flow restriction to the upper arm and compare the change in blood flow for three different restrictive pressures.

Intellectual Merit

Currently, blood flow restriction research emphasizes the importance of using a restriction pressure relative to the individual instead of an absolute pressure (e.g. 100 mmHg). To make pressure relative to the individual, the minimum pressure necessary to occlude blood flow is measured and a percentage of that pressure is applied as the stimulus. It is well documented that the amount of pressure necessary to occlude blood flow depends on individual limb circumference and width of the cuff used. Additionally, in comparison to using one absolute pressure, some researchers believe that a relative pressure may elicit a similar stimulus across individuals. However, the blood flow restriction stimulus variability between an absolute pressure and commonly used relative pressures has not been compared. This is important because to work towards standardization of blood flow restriction as a therapeutic modality, researchers need the ability to compare results across individuals, studies, and clinical settings. Thus, the purpose of this study is to compare the variability in blood flow changes using an absolute blood flow restriction pressure (that likely would not occlude blood flow) and two common relative pressures. For this project, participants will have a blood flow restriction cuff placed at the upper portion of their arm while sitting in a relaxed position. Then, we will measure blood flow at rest, at two different relative pressures (40% arterial occlusion; 80% arterial occlusion), and at an absolute pressure (100 mmHg). We will compare these blood flow measures and determine if the level of variability is different between these three pressures.

External Opportunity

The external opportunity I would apply for is the American College of Sports Medicine Foundation Doctoral Student Research Grant 2021. This is a one-year grant for doctoral students and would provide up to \$5,000, which we would use to build upon the findings of the current proposed project. This money can be used for experimental subjects, supplies, and small equipment needs. The grant is due January 15, 2021. In our field of study, the American College of Sports Medicine is a leading governing body, providing current exercise guidelines, professional development, and fosters production of novel research in our field. Thus, receiving a funding opportunity from American College of Sports Medicine would greatly aid my research and academic career by showing that my project as a first-year doctoral student was promising and worth supporting. The Graduate Student Council Research Grant will be fundamental in completing this initial project, and provide us a stepping stone for subsequent projects that will have a larger impact in the field of Exercise Science with external support.