A SCHOLARLY REFLECTION ON IMPROVING QUALITY OF LIFE IN THOSE WITH SPINAL CORD INJURY

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The physiological and perceptual implications of an exercise program are generally not well understood in persons with spinal cord injury (SCI). Likewise, no study has explored the differences in enjoyment between a type of exercise known as High Intensity Interval Training (HIIT) and Continuous Exercise (CEX) in this population. Despite this, a robust collection of literature illustrates several physiological adaptations to HIIT in able-bodied populations. In combination with reducing chronic disease in this population, the purpose of this research inquiry was to consider the feasibility and efficacy of HIIT in those with SCI.

The references of the current work were primarily sourced from the *Pub Med* database. Specifically, "advanced search" proved most useful in obtaining relevant articles using a combination ("or" tab selection) of the following search terms relating to our variables and population: exercise, Rating of Perceived Exertion (RPE), affect, enjoyment, and spinal cord injury. Given the novelty of this study, locating supporting literature involved interpretation and application, which was sometimes difficult. Only two studies (Hicks, 2003; Lewis, 2007) were found utilizing a comparable methodology and dependent variable. Therefore, in evaluating the appropriateness of supporting works, I decided to first establish HIIT as a worthwhile means of exercise. Potential studies were analyzed based on their relatedness to aspects of HIIT such as physiological adaptations (e.g. oxygen consumption, metabolic rate, and insulin sensitivity) and perceptual measures (e.g. RPE, affect, enjoyment). Specific works by Martinez (2015), Whyte (2010), and Wisløff et al. (2007) respectively describe changes in enjoyment in HIIT and maximal oxygen uptake (VO_2max) in able-bodied populations. Equally important in these works, however, was the demonstration that adaptations occurred within sedentary individuals. If the benefits of HIIT were to be generalized to SCI, the consideration that they occur within comparatively sedentary and or chronically diseased individuals was critical.

Alternatively, HIIT has not been universally accepted as a viable means of exercise for sedentary populations. Recently, Hardcastle et al. (2014) recently criticized the general practicality of one approach of HIIT, sprint interval training (SIT), which continues be implemented to improve VO_2max and other health outcomes (Astorino, 2011). Hardcastle et al. assert that SIT (and other forms of HIIT) is too physically and psychologically demanding for those unaccustomed to exercise, and may discourage sedentary populations from adhering to such an exercise program. SIT is therefore stated to be only appropriate for athletes. Differences in the interpretation of HIIT's appropriateness in existing literature suggest a need for additional research in unfit individuals such as those with SCI.

The search for appropriate tools in the current study was not limited to previous methodologies in text. Methodological considerations were obtained from the advice of Dr. Todd Astorino, an expert in exercise physiology, as well as my personal history as his student. For example, although I was familiar with the implementation of a HIIT protocol in able-bodied persons, I sought recommendations from Dr. Astorino on the appropriate modification of this protocol for special population such as SCI. HIIT is not "one size fits all", and must be adjusted according to the target population to obtain meaningful data.

In other areas, my employment with *Project Walk*, a local SCI recovery facility, provided two additional benefits in the undertaking of this work. The first of which was recruiting participants. However, even within a SCI facility, securing a meaningful number of SCI participants is often a significant challenge in research, and may explain the relative lack of literature within this population. *Project Walk* also illustrated to me the daily life and varying perspectives of those with SCI. These two considerations uncovered the functional abilities and attitudes toward exercise within a given individual. Consequently, I recognized that HIIT may

not be possible or appealing to everyone in the SCI population, such as those with high-level cervical injuries. Together, these out-of-text resources allowed for an applied perspective of exercise physiology in those with SCI, as well as how to approach an exercise study involving a SCI population.

Research within the SCI community in has proven to be a rewarding and enlightening experience. CSUSM has provided a setting where I was able to learn from my mistakes while developing good research habits early in my career. Through my work, I recognize the great amount of time and consideration incorporated into each of my supporting articles and peer reviewed scientific articles in general. It is clear to me that few conclusions in scientific inquiry exists as simple dichotomous answers, although a wealth of clarifying resources exist if you have learned where to look.