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Research Critique on “Efficacy and Feasibility of HIIT Training for University Students: The Uni-HIIT RCT”

Sewina Yu & Joon Young Kim

Syracuse University, New York, USA

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ABSTRACT

Introduction: High-intensity interval training (HIIT) has gained lots of research interest due to its effectiveness in physiological adaptations for a shorter amount of time relative to traditional aerobic/resistance training. Previous studies investigated the effects of HIIT in a lab setting, thereby lacking evidence on the efficacy of HIIT in a real-world background such as college life. Moreover, focusing on younger adults is unique target population as they have a more positive attitude toward physical activity, thus they have strong intentions to exercise, yet the transition to college life, coursework, and other aspects of this life stage inhibit them from exercising.

Purpose: N. Eather et al. aimed to evaluate the efficacy and feasibility of the 8-week HIIT program called “Uni-HIIT” incorporating resistance training in young adult students in a university setting.

Methods: A randomized controlled trial with young adults aged 18-25 (20.4 ± 1.9 yrs) was performed for the comparison of HIIT training ($n=26$) vs. control ($n=27$) over 8-week periods. The Uni-HIIT consisted of 3 sessions per week lasting 8-12 minutes: each session incorporated both aerobic and core-strengthening exercises, where participants could choose various types of HIIT such as Gym-, Combat-, Brain- and Sports-HIIT. For each HIIT protocol, a 30 second work to 30 second rest ratio was used. Outcomes included cardiorespiratory fitness (20-meter shuttle run), muscular fitness (standing long jump and the push-ups), body composition (skinfold calipers and bioelectrical impedance), executive function (Trail Making Test), anxiety levels (State Trait Anxiety Inventory), and perceived stress (Perceived Stress Scale).

Results: There was a significant group-by-time interaction on cardiorespiratory fitness evidenced by greater improvement on 20-meter shuttle run in the HIIT vs. control (adjusted difference in change [ADC] 8.4 laps, $p=0.004$). Further, participants in the HIIT group showed significant increase in (a) upper body muscular fitness (ADC 4.0 reps, $p=0.006$) and executive function for Trail B (ADC -5.9, $p=0.052$), while both groups exhibited no changes in body composition, lower body muscular fitness, anxiety

levels, and perceived stress. Participants rated the program highly in satisfaction (4.73), enjoyment (4.54), and perceived value (4.54).

Conclusion: The Uni-HIIT is considered a novel approach as various “enjoyable” programs are mixed with promising improvements on cardiovascular & muscular fitness and executive function in young adult students. High satisfaction on the program may attest its feasibility and practicality.

Critique: Despite the uniqueness of various combination of HIIT programs in the university setting, there are several critiques we should discuss for the purpose of developing better HIIT program in younger population. First, metabolic health outcomes such as glucose/insulin metabolism and inflammatory response should be examined in addition to the physical improvement as HIIT aims to improve both cardiometabolic health and sports performance. Second, various protocols for HIIT may be at risk for critical errors (i.e., unmatched amount of the workout between each protocol), which will hinder definitive conclusion of HIIT effects on outcomes. Additionally, the comparison of classical HIIT program is warranted to see if the Uni-HIIT can be a novel approach. Third, low adherence rate for weekly sessions (only 55% of participants attended at least 2 sessions per week for the 2-weeks) is in fact contradictory to the observation of high ratings in satisfaction (mean = 4.73/5), enjoyment (mean = 4.54/5), and perceived value (mean = 4.54/5). Whether or not the study properly concluded its feasibility is questionable. Lastly, a separation of overweight/obese participants from the lean participants (dominant population in the present study) could minimize potential bias when examining improvements on metabolic health, physical fitness, and athletic performance. In closing, additional investigation of the Uni-HIIT by wide range of weight status and outcome measures and with longer periods of the intervention is warranted.

Author Information

Sewina Yu

Department of Exercise Science, David B. Falk College of Sport and Human Dynamics, Syracuse University, Syracuse, NY, USA.

Email: syu125@syr.edu

Joon Young Kim, Ph.D., <https://orcid.org/0000-0003-0448-1684>

Assistant Professor, Department of Exercise Science, David B. Falk College of Sport and Human Dynamics, Syracuse University, Syracuse, NY, USA.

Email: jkim291@syr.edu



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