

### **A Case Study Examining Health and Fitness Effects of Thru Hiking the Pacific Crest Trail**

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#### **ABSTRACT**

This abstract has not been presented and will not be presented at any other conference, other than National ACSM. Abstract submission assumes study has been approved by an appropriate IRB. The Pacific Crest Trail (PCT), a long-distance hiking route spanning from the U.S.-Mexico Border to the U.S.-Canada border, is a compelling research topic for studying human performance. Thru hiking involves enduring high volumes of moderate-vigorous exercise, load carriage of survival gear, environmental conditions, hydration, nutrition, sleep, and psychological well-being, alongside addressing challenges like navigation, limited resupply, encounters with wild animals and injury/illness. **PURPOSE:** This case study investigated the impact of thru hiking the PCT on physical fitness and health in a cohort of three non-elite male hikers. **METHODS:** The participants had two visits to the lab, following an 8-12 hour overnight fast. The first visit occurred a week before the participant's planned start date, while the second occurred within a week of completing the hike. The participants completed a maximal graded exercise test using the Bruce protocol to determine VO<sub>2</sub>max, in addition their total and regional body compositions were assessed using dual x-ray absorptiometry. Physical activity, energy expenditure, sleep, stress, and environmental conditions were estimated during the hike using a high-end commercial smart watch with an embedded GPS system and photoplethysmography based heart rate and oxygen saturation monitor and they kept a journal of their 24-hour food/beverage records. **RESULTS:** All participants demonstrated substantial enhancements in both maximal (mean VO<sub>2</sub>max = + 12.1 ml/kg/min) and submaximal fitness (mean ventilatory threshold = + 14.7% VO<sub>2</sub>max), along with significant improvements in overall body composition; however, two out of three hikers experienced an increase in visceral fat (mean = + 0.11 kg). Additionally, although all hikers achieved the recommended 7-9 hours of sleep each night none met the advised amount of deep sleep per night. All three hikers' diets were lacking in energy sufficiency and were low in several micronutrients associated with visceral adipose tissue gain. **CONCLUSION:** This study highlighted the significance of addressing nutritional needs to optimize the outcomes of long-distance hiking expeditions. Further research and target dietary interventions can enhance both performance and health outcomes of thru hikers on extended journeys like the PCT.