

## 50. SWACSM Abstract

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### Crossing Over to The Other side; Studying Effect of Fatigue When Walking in a Randomized & New Space

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#### ABSTRACT

Slips, trips, and falls (STFs) that lead to a substantial amount of workplace injuries. In any career that requires physical effort, it is crucial to maintain a strong reaction and response time to these unpredictable environments to maintain worker safety. In dynamic, ever-changing workplaces, it is important to know how to best mitigate trip and fall risk. However, there is little literature describing how physical fatigue affects young, healthy individuals' ability to negotiate obstacles, as well as whether there are worker characteristics that may put them at greater risk of STFs. **PURPOSE:** Therefore, our purpose is to identify the effects of physical fatigue on an individual's ability to navigate unpredictable obstacles and to see if factors such as age, sex, height, and physical fitness could predict how participant obstacle negotiation mechanics. **METHODS:** Twenty-one college aged subjects with a moderate to high fitness level were screened for participation. These participants then underwent 10 obstacle crossing trials where they navigated a randomly placed hurdle in a pitch-black room, 5 before and 5 immediately after undergoing a fatiguing exercise protocol. An 8-camera three-dimensional (3D) motion capture system was used to quantify spatiotemporal obstacle negotiation variables like toe and heel clearances of both legs, as well as foot placement on the step before negotiation. Regression models were used to determine if participant age, sex, height, or estimated  $VO_2$ max significantly predicted these obstacle negotiation outcomes. **RESULTS:** Following fatiguing exercise, participants exhibited statistically lower foot clearance and foot placement values, indicating riskier behavior when fatigued. Moreover, we found that estimated  $VO_2$ max significantly predicted foot placement on the step before negotiation, indicating a decreased ability to properly plan and negotiate an obstacle when fatigued. **CONCLUSION:** The results obtained help to highlight the impact of physical fatigue in laborious professions with dynamic and unpredictable workplaces. These results hope to inform companies and workers to explore and highlight the importance of maintaining the cardiovascular health of their employees to decrease the risk of a workplace accident.