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INTRODUCTION

The benefits of physical activity are well known - reductions in cardiovascular disease, hypertension, diabetes, and obesity prevention. In order to prescribe the appropriate physical activity to specific populations, it is necessary to understand current activity behaviors and affective responses to exercise.

National guidelines recommend 150 minutes per week of moderate-intensity or 75 minutes of vigorous-intensity physical activity. While the general US population does not achieve these guidelines, the number of Native Americans meeting exercise guidelines is even lower. There is a clear need to increase Native Americans' physical activity.

OBJECTIVES

Our study assessed barriers to exercise in Native American and non-Native American participants and evaluated emotional response to exercise in order to ultimately assist healthcare providers in developing culturally appropriate exercise prescriptions tailored to their patients' health status and exercise preferences.

EXERCISE/FACEREADER METHODS

- Participants: 39 total adults, including 5 Native Americans
- Consent was obtained and participants performed incremental exercise testing on an indoor cycle ergometer with heart rate recorded every two minutes.
- Perceived exertion was rated by participants using the RPE scoring scale on a post-exercise questionnaire.
- Participants' emotional response to the exercise bout was analyzed using FaceReader. Faces were continuously analyzed in real time during exercise using a camera mounted on the cycle.
- All procedures in this study received approval from the OSU-CHS IRB to ensure compliance with ethical guidelines (2023024-OSU-CHS).

RESULTS

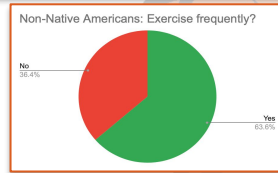


Figure 1. Perception of adequate exercise among Non-Native Americans

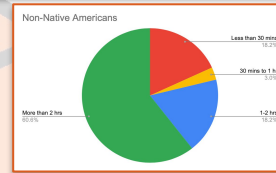


Figure 2. Amount of time exercising per week (Non-Native Americans)

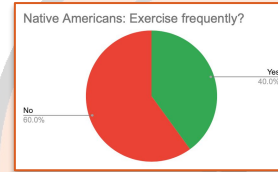


Figure 3. Perception of adequate exercise among Native Americans

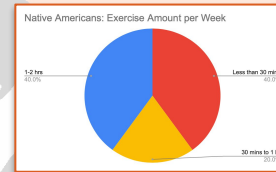


Figure 4. Amount of time exercising per week (Native Americans)

Results of our study showed that 40% of Native Americans answered yes to exercising frequently, based on their own perception of adequate exercise achieved. However, when asked the amount of time spent per week exercising, 0% of Native participants reported exercising the recommended minimum of 150 minutes (2.5 hours). Compared to Non-Native participants, 60% of participants felt as they exercised frequently. Subsequently, 60% of participants then reported exercising more than 2 hours per week.

CONCLUSION

- Our results showed that Native Americans report exercising frequently, but based on our results, they are not exercising the recommended amount. This is contrasted by Non-Native Americans and their response to the same question. Non-Native American participants who believed they were exercising frequently were largely meeting the recommended amount of time per week exercising.
- Facial analysis software, such as FaceReader, can provide new options for investigating emotions during exercise. This information can be used to identify preferable modes of exercise based on demographics such as gender or cultural identification.
- This study combined emotional response, perceived exertion, heart rate, and demographic data to determine the best exercise protocol for the individual.
- Increasing exercise intensity leads to changes in facial expression; **therefore, it could be argued that emotional response could be used as a tool to measure affective state as well as effort during an exercise bout.**

FUTURE DIRECTIONS/ APPLICATIONS

- Physicians may be able to use this information to prescribe exercise more specifically to their patients, with the goal of greater adherence to exercise regimens.
- A new way to investigate the relationship between physical exercise and emotional state could be to change the participants surroundings.
- **Furthermore it was discovered that participants reacted positively with stimuli and conversation; therefore, a different direction would be to use different stimuli or use two participants during the same exercise time.**

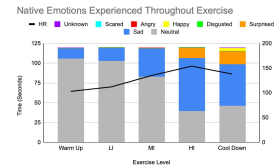


Figure 5. Emotional response, heart rate, and perceived exertion during incrementally increasing physical exercise in an experimental Native female participant in the 25-34 age group.

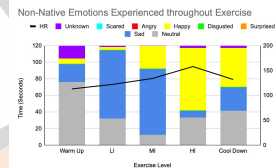


Figure 6. Emotional response, heart rate, and perceived exertion during incrementally increasing physical exercise in an experimental non-Native female participant in the 25-34 age group.