New study shows exercise may protect against future emotional stress

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Moderate exercise may help people cope with anxiety and stress for an extended period of time post-workout, according to a study by kinesiology researchers in the University of Maryland School of Public Health published in the journal *Medicine and Science in Sports and Exercise*.

"While it is well-known that exercise improves mood, among other benefits, not as much is known about the potency of exercise's impact on emotional state and whether these positive effects endure when we're faced with everyday stressors once we leave the gym," explains J. Carson Smith, assistant professor in the Department of Kinesiology. "We found that exercise helps to buffer the effects of emotional exposure. If you exercise, you'll not only reduce your anxiety, but you'll be better able to maintain that reduced anxiety when confronted with emotional events."

Smith, whose research explores how exercise and physical activity affect brain function, aging and mental health, compared how moderate intensity cycling versus a period of quiet rest (both for 30 minutes) affected anxiety levels in a group of healthy college students. He assessed their anxiety state before the period of activity (or rest), shortly afterward (15 minutes after) and finally after exposing them to a variety of highly arousing pleasant and unpleasant photographs, as well as neutral images. At each point, study participants answered 20 questions from the State-Trait Anxiety inventory, which is designed to assess different symptoms of anxiety. All participants were put through both the exercise and the rest states (on different days) and tested for anxiety

levels pre-exercise, post-exercise, and post-picture viewing.

Smith found that exercise and quiet rest were equally effective at reducing anxiety levels initially. However, once they were emotionally stimulated (by being shown 90 photographs from the International Affective Picture System, a database of photographs used in emotion research) for ~20 minutes, the anxiety levels of those who had simply rested went back up to their initial levels, whereas those who had exercised maintained their reduced anxiety levels.

"The set of photographic stimuli we used from the IAPS database was designed to simulate the range of emotional events you might experience in daily life," Smith explains. "They represent pleasant emotional events, neutral events and unpleasant events or stimuli. These vary from pictures of babies, families, puppies and appetizing food items, to very neutral things like plates, cups, furniture and city landscapes, to very unpleasant images of violence, mutilations and other gruesome things."

The study findings suggest that exercise may play an important role in helping people to better endure life's daily anxieties and stressors.

Smith plans to explore if exercise could have the same persistent beneficial effect in patients who regularly experience anxiety and depression symptoms. In collaboration with the new Maryland Neuroimaging Center, he is also exploring the addition of functional magnetic resonance imaging, or fMRI, to measure brain activity during the period of exposure to emotionally stimulating images to see how exercise may alter the brain's emotion-related neural networks.

Smith also investigates the role of exercise in preventing cognitive decline in older adults. His research has shown that physical activity promotes changes in the brain that may protect those at high risk for Alzheimer's disease.

More information: His article, "Effects of Emotional Exposure on State Anxiety after Acute Exercise," was published online ahead of print on Aug. 14, 2012 in the journal *Medicine and Science in Sports and Exercise*. www.exerciseforbrainhealth.com/publications

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