

# First brain study reveals benefits of exercise on quitting smoking

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Research from the University of Exeter reveals for the first time, that changes in brain activity, triggered by physical exercise, may help reduce cigarette cravings. Published in the journal *Psychopharmacology*, the study shows how exercise changes the way the brain processes information among smokers, thereby reducing their cravings for nicotine. For the first time, researchers used functional Magnetic Resonance Imaging (fMRI) to investigate how the brain processes images of cigarettes after exercise.

The study adds weight to a growing body of evidence that exercise can help manage addiction to nicotine and other substances. It backs up previous studies, which have shown that just one short burst of moderate exercise can significantly reduce smokers' nicotine cravings.

Ten regular smokers were asked to cycle at a moderate pace for ten minutes, after 15 hours of abstinence from nicotine. They were then given an fMRI scan while they viewed a series of 60 images. Some visuals featured cigarettes and would normally induce cravings in a smoker. On a second occasion, the same group was given an fMRI scan and shown the same series of images without having undertaken exercise. They were also asked to report on their cravings for nicotine during both phases of the study.

The brain images captured by the fMRI show a difference between the two conditions. After no exercise the smokers showed heightened activity in response to the images in areas of the brain associated with

reward-processing and visual attention. After exercise the same areas of activation were not observed, which reflected a kind of 'default mode' in the brain. The smokers also reported lower cravings for cigarettes after exercise compared with when they had been inactive.

The researchers do not know exactly what caused the difference in brain activity following exercise. One suggestion is that completing exercise raises mood (possibly through increases in dopamine) which reduces the salience or importance of wanting a cigarette. Another possibility is that exercise causes a shift in blood flow to areas of the brain less involved in anticipation of reward and pleasure generated by smoking images.

Previous research by the University of Exeter has suggested that exercise can reduce nicotine cravings. Results from a series of studies show that smokers report reduced cigarette cravings after exercising. This study showed that exercise can reduce cravings when smokers are faced with images that have been previously shown to cause lapses in smokers trying to quit. This is the first time that anyone has investigated brain activity during this process.

Kate Janse Van Rensburg, a PhD student at the University of Exeter, lead author on the paper, said: "Our findings add to a growing body of evidence suggesting that exercise can help people give up smoking. This strengthens the argument that moderate exercise could be a viable alternative to many of the pharmaceutical products, such as nicotine patches, for people who want to give up smoking. A ten or fifteen minute walk, jog or cycle when times get tough could help a smoker kick the habit. There are of course many other benefits from a more active lifestyle including better fitness, weight loss and improved mood."

Source: University of Exeter

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