

# Nicotine Lessens Symptoms of Depression in Nonsmokers

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Nicotine may improve the symptoms of depression in people who do not smoke, Duke University Medical Center scientists have discovered.

The finding does not mean that people with depression should smoke or even start using a nicotine patch, the researchers caution. They say that smoking remains the No. 1 preventable cause of death and disability in the United States, and that the addictive hazards of tobacco far outweigh the potential benefits of nicotine in depression.

But the finding suggests that it may be possible to manipulate nicotine's effects to safely reap its potential medical benefits, according to the researchers. As an example of the drug's potential, they said, pharmaceutical companies already are developing compounds for treating other brain disorders by mimicking the beneficial properties of nicotine while avoiding its addictive nature.

"The hope is that our research on nicotine will spur the development of new treatments for depression, which is a huge public health problem," said lead study investigator Joseph McClernon, Ph.D., an assistant research professor of medical psychiatry and researcher at the Duke Center for Nicotine and Smoking Cessation Research.

"Our study also provides evidence that smokers may indeed smoke, in part, to improve their mood -- a notion that has been quite controversial in the field," he said.

The team's findings are scheduled to appear the week of Sept. 11, 2006, in the online edition of the journal *Psychopharmacology* and will be published in print in November.

The research was supported by the National Alliance for Research on Schizophrenia and Depression.

Scientists have established that people prone to depression are twice as likely to be smokers, and are less likely to succeed in quitting smoking after taking up the habit, according to McClernon. The Duke study explored the theories behind the higher smoking rates among people experiencing depression.

"Smokers may be more prone to depression than nonsmokers," said Edward Levin, Ph.D., a professor of biological psychiatry and researcher at the Duke center, who was senior investigator in the current study. "Or, people with depression may be self-medicating by smoking, albeit in a deadly way."

In the study, the researchers recruited 11 people who did not smoke but who were experiencing symptoms of depression. Participants were randomly assigned to wear either a nicotine patch or a placebo patch that did not contain any nicotine. The researchers used a standardized method, a 20-item questionnaire called the Center for Epidemiological Studies Depression scale, to measure depression symptoms among the study participants.

"Despite the small number of participants, this is the largest study of its kind," McClernon said.

The team found that participants who wore the nicotine patch for at least eight days experienced a significant decline in their depression-assessment rating scores. McClernon said this finding indicates that the

drug led to an improvement in depression symptoms.

As a possible explanation for how nicotine exerts its beneficial effect, McClernon said: "The same areas of the brain that are stimulated by nicotine appear to be involved in the regulation of mood."

Nicotine stimulates the release of specific neurotransmitters, including serotonin, dopamine, and norepinephrine, which carry messages between nerves cells. Depression has been linked to chemical imbalances of these neurotransmitters, McClernon said.

Looking ahead to possible therapeutic uses of nicotine for treating depression, the researchers say the nicotine molecule can be manipulated to remove its addictive effect while maintaining its ability to increase levels of the various brain chemicals that can alter mood. Currently, pharmaceutical companies are developing nicotineline drugs that target chemical imbalances in the brain that are thought to cause anxiety, schizophrenia, attention deficient hyperactivity disorder, Alzheimer's disease and Parkinson's disease.

The study also suggests that people prone to depression may need extra help in order to quit smoking, such as nicotine replacement therapy, the scientists said.

Despite the positive effects of nicotine discovered in their study, the researchers emphasize that it is not currently appropriate for treatment of any medical disorder outside of nicotine dependence.

"I certainly recommend that people don't smoke," Levin said. "If you do smoke, quit."

Other researchers participating in the study included F. Berry Hiott, Eric C. Westman and Jed E. Rose.

Source: Duke University

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