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EXPERT COMMENT: Smoking harms not just your physical health, but your mental health too

[Tom Heffernan](#), Programme Leader in Psychology with Criminology, and [Anna-Marie Marshall](#), PhD researcher and demonstrator at Northumbria University, write about smoking for The Conversation.

A middle-aged cigarette smoker who has smoked for decades is two to three times more likely to die early than someone similar who has never smoked. Tobacco smoking is well known to be a major risk factor for various cancers, lung and cardiovascular problems, and is also linked to other health problems, such as complications in pregnancy, low sperm count in men, oral problems, and increased likelihood of cataracts.

Little wonder then that the World Health Organisation (WHO) sees tobacco smoking as the number one avoidable cause of death in the world. US statistics reveal that smoking causes [more deaths each year](#) than HIV, illegal drug use, alcohol misuse, motor vehicle injuries and homicides combined. Similar comparisons can be found in [UK statistics](#).

However, while there can be few today who are unaware of the toll smoking takes on the body, the effects of long-term tobacco smoking on other areas such as learning and memory are less well known.

Although some studies have shown that the nicotine in cigarettes can [improve concentration and attention](#) (making smokers feel more alert), there's more to cigarettes than just nicotine. They contain over 4,000 chemicals – over 50 of which are known to be toxic in nature: the carbon monoxide also found in car exhaust fumes, butane found in lighter fluid, and

arsenic, ammonia, and methanol found in rocket fuel, for example.

It's thought that a long-term build-up of these toxic chemicals can damage the brain, leading to deficits in learning and memory. Long-term smoking has been linked with reductions in working memory, prospective memory – that used for everyday tasks such as keeping an appointment or taking medication on time – and executive function, which helps us plan tasks, pay attention to current activities, and ignore distractions. These three underpin our everyday ability to remember and learn, without which independent living would be much more difficult.

In the first [study](#) of its kind, our team of researchers from Northumbria University reported in the journal *Frontiers in Psychiatry* our findings that those who smoke and drink heavily show greater deficits in their everyday prospective memory. More so, in fact, than those who smoke but do not drink heavily and those who drink heavily but do not smoke combined. This suggests there's a “double whammy” effect to combining smoking and drinking.

Recent studies of smoking-related health problems and memory deficits has included the effects of “second-hand” or “passive” smoking, where non-smokers inhale tobacco smoke from smokers. Research here has found the [same range of health-related problems linked to passive smoking as found in smokers](#), including lung and cardiovascular disease and cognitive and memory problems. These could affect a passive smoker in a number of spheres of life, not just health but educational and occupational, given the universal requirement and use for everyday remembering.

Quitting smoking improves health and leads to improvements in cognition. This may be linked to an increase in the thickness of the brain's cortex – the outer layer of the brain which plays a critical role in information processing and memory. The cortex naturally thins with age, but smoking can worsen this effect causing the cortex to [thin at an accelerated rate](#).

Stopping smoking can help partially to reverse this effect on the cortex, but not to the levels found in a non-smoker. Traditional methods of quitting smoking have focused on nicotine replacement therapy (NRT), such as nicotine chewing gum, patches, inhalators and nasal sprays. This typically takes around eight to 12 weeks before producing demonstrable health improvements.

An increasingly popular form of NRT is the e-cigarette: a battery-powered electronic nicotine delivery device resembling a cigarette that does not contain tobacco. The use of e-cigarettes over smoking tobacco recently has been found to [improve everyday prospective memory](#)(memory for future activities), but we presently know little about what long-term impact e-cigarettes may have upon health, mood and cognitive functions.

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