We’ve done a good job at reducing adolescent cigarette smoking over the past decade as we can see in the top left graph. However, adolescents are still using nicotine, which is the main addictive component found in cigarettes via the use of vaporizers. We can see in the bottom left graph that in 2019, a quarter of grade 12 students reported passed month nicotine vaping.

Surprisingly, many adolescents have reported that they’re not aware that nicotine is in these products, even though they can actually contain more nicotine than a typical cigarette. Adolescent nicotine vaping is associated with increased cigarette smoking even in individuals who may have otherwise never tried cigarettes, and cigarette smoking is the still the leading cause of preventable death.

Early life stress is associated with increased nicotine use and dependence, and the ongoing COVID-19 pandemic is increasing stress in youth. The number of adolescents that have reached out to the Kids Help Phone in 2020 has more than doubled compared to 2019.

The top portion of my slide summarizes my main research focus. What are the immediate and long-lasting effects of individual or combined adolescent nicotine and stress exposure? The timeline on the bottom portion of the slide emphasizes that in humans, it’s hard to research the long-lasting effects since the same participants would have to be tracked over the course of many years.

Rodents, however, share similar brain circuitry, and are a great model for longer studies of addiction and reward given that their lifetime is much shorter. Experiments in rodents can provide information in a few months as opposed to years.

So far, my research using a rodent model has found that adolescent nicotine and stress exposure alone can increase adult nicotine use, and that the combination of adolescent nicotine and stress exposure can increase adult nicotine use more than either of these experiences alone.

My research continues to identify any changes to the brain as a result of this adolescent experience that could be driving these negative long-term effects, and ultimately, I hope to be able to identify targets that can help in the development of new smoking sensation therapies given that many individuals that use nicotine are unsuccessful in quitting with the current treatment options. So, given that adolescent nicotine vaping and stress levels are increasing now, and my research suggests that adolescent nicotine and stress exposures increases adult nicotine use and dependence.

It begs the question, what will adult nicotine use look like a decade from now when these individuals grow up into adults. It is crucial to develop new therapies now that could help reduce these negative long-term effects, and also potentially prevent a surge in future adult nicotine use and dependence. Thank you.

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