

SCIENCE FACT OR SCIENCE FICTION: DO SEX AND GENDER MATTER IN CANNABIS USE?

Medical and recreational cannabis use is on the rise and with legalization on the horizon in Canada, use is predicted to grow further. Medical cannabis has been used with success in the treatment of certain health conditions including pain, however, the full extent of its health impacts on men and women remains unknown. With an expected increase in Canadians using cannabis both medically and recreationally, researchers, clinicians and policymakers must consider: How do sex and gender influence the use and health effects of cannabis?

SEX 	GENDER 
Biological attributes of humans and animals, including physical features, chromosomes, gene expression, hormones and anatomy.	Socially-constructed roles, behaviours, expressions and identities of girls, women, boys, men and gender-diverse people.

SEX DIFFERENCES AND CANNABIS

Research has begun to identify sex differences in the effects of cannabis. Sex hormones appear to play a role. Biomedical studies have demonstrated that effects in the brain are influenced by sex and that females have fewer CB1 cannabinoid receptors (the part of the cell that mediates the response to cannabis) in certain brain regions^{1,2}. Research also suggests that progesterone tends to promote dependence on delta 9-tetrahydrocannabinol (THC)—the chemical responsible for most of the drug's psychoactive effects—in females while testosterone may protect against dependence in males³.

Sex differences in the effects of cannabis may also be due in part to differences in muscle mass and fat tissue distribution between men and women. Because cannabinoids dissolve readily in lipids and are stored in fat cells and women tend to have a higher percentage of body fat, they may experience the effects of cannabis differently.

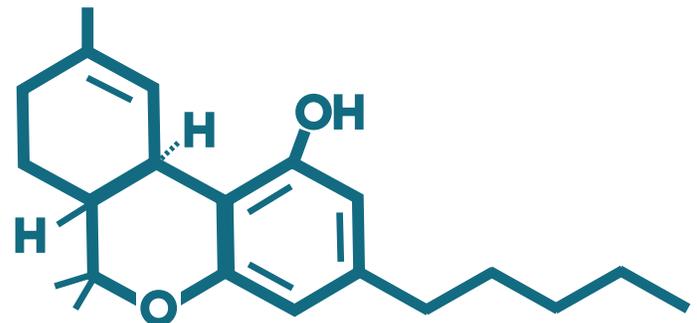
Men have higher rates of diagnosed Cannabis Use Disorder⁴, however, research indicates women have more

concerns about their cannabis use and dependence⁵. Young women tend to accelerate to regular cannabis use and dependence more quickly than men^{6,7}. Women may also have more severe withdrawal symptoms, including restlessness, irritability, nausea, stomach pain⁸. When cannabis is consumed along with other drugs, severity of effects may differ by sex and gender. A recent study found that the combination of smoking both cannabis and tobacco significantly increased the risk of spontaneous pneumothorax (lung collapse) in men but not in women⁹.

CANNABIS AND REPRODUCTION

Some studies have found that cannabis may affect menstrual cycles, reproductive systems and fertility¹⁰. For example, women who use cannabis can have altered menstrual cycles¹¹, which can lead to difficulty getting pregnant.

Cannabis is the most commonly used illicit drug amongst pregnant women^{12,13}. While scientists are still learning about the long-term effects of cannabis use during pregnancy, some reports suggest it may link to decreased birth weights¹⁴. One recent study found that use of cannabis during pregnancy may be associated with an increased risk of neonatal morbidity¹⁵. As cannabis use in women is quickly catching up to rates of use in men¹⁶, research on sex differences is becoming a public health imperative.



DELTA 9-TETRAHYDROCANNABINOL

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GENDER INFLUENCES ON CANNABIS USE

Men are more likely to use cannabis recreationally, while women are more likely to use it for medicinal purposes.¹⁷ With broader legalization and acceptance, women may feel reduced social pressure to abstain from using cannabis. Rising rates of use in girls and women could be due in part to legal, social and cultural changes^{16,18}.

Gender also influences the way in which people consume cannabis. Women are more likely to consume edible products, while men report more smoking, vaporizing and use of concentrates such as hash and oils, as well as higher rates of use overall¹⁷.

Different routes of administration may influence how cannabis affects the user. For example, smoking may lead to a faster and more intense high because it takes less time for the user to achieve peak blood levels of the active metabolite in cannabis. As the cannabis industry develops and more products reach the market, this gender discrepancy could influence the different ways in which people use and are affected by cannabis.

CONCLUSION

Understanding how sex and gender influence cannabis use and its effects is essential for effective regulation and management of the drug. Ensuring safe use will become more and more important as the Canadian legal and cultural environment changes with regards to cannabis. Gaining a deeper understanding of sex and gender differences will ensure that public health officials, clinicians and the public engage with cannabis safely and responsibly.

REFERENCES

1. Castelli MP et al. 2014. *Curr Pharm Des.* 20, 2100-2113.
2. Cooper ZD, Craft RM. 2017. *Neuropsychopharmacology.* 1-18.
3. Marusich et al. 2015. *Exp Clin Psychopharm.* 23: 206-216.
4. Kerridge BT et al. ePub 2017. *Addictive Behaviors.* 52-60.
5. Copeland J, Swift W, Rees V. 2001. *J Subst Abuse Treat.* 20: 45-52.
6. Schepis TS et al. 2011. *J Addict Med.* 5:65-73.
7. Ehlers CL et al. 2001. *Addict Behav.* 35:102-110.
8. Herrmann ES, Weerts EM, Vandrey R. 2016. *Exp Clin Psychopharm.* 23:415-421.
9. Hedevang Olesen, W et al. 2017. *Eur J Cardiothorac Surg.* Ezx160. ePub.
10. Brents LK. 2016. *Yale J Biol Med.* 89: 175-191.
11. Jukic AMZ et al. 2007. *J Womens Health* 16(9): 1340-1347.
12. The American College of Obstetrics and Gynecologists. 2015. bit.ly/2eL45G9
13. Substance Abuse and Mental Health Services Administration. 2016. bit.ly/2xaWivA.
14. El Marroun H et al. 2009. *J Am Acad Child Adolesc Psychiatry.* 2048:1173-81.
15. Metz TD et al. 2017. T.D. *Am J Obstet Gynecol.* ePub, May 31.
16. Canadian Tobacco, Alcohol and Drugs Survey. 2015. bit.ly/2vKlCgZ
17. Cuttler C, Mischley LK, Sexton M. 2016. *Cannabis Cannabinoid Research.* 1: 167-175.
18. Hajizadeh M. 2016. *Int J Health Policy Manag.* 5(8):453-456.



SARAH'S STORY

Sarah, a 33-year-old regular cannabis user, tells us about her experiences with the drug and how it affects her health.

Why do you use cannabis?

I'm a daily smoker, primarily for recreation and stress management, but also for pain management. I have really severe menstrual pain, as well as IBS [*irritable bowel syndrome*]. Marijuana relieves my cramping, nausea and diarrhoea. It also stimulates my appetite when I'm unable to eat because of my IBS. It works better than other painkillers and I feel it's gentler on my body.

How do you use cannabis?

I usually smoke joints, but when I have access to edible products with THC in them, I prefer those. I find that they give you a less intense high than with smoking.

What does your doctor say?

My doctor is generally not pro-cannabis, but she supported me in finding a tool that works with my lifestyle. She also recommended I take breaks occasionally to ensure I don't develop a problem. I do experience some mild withdrawal symptoms when I take breaks, which are mostly pain-related. I know that there can be some side effects for fertility, but for me, the pain reduction is worth that risk.

Do you feel any gender-related pressures relating to cannabis use?

I think it's far less harmful and more effective than people think. I also think that as a woman, no other drugs have helped me manage the pain I experience from menstruation and related IBS symptoms. I don't feel significant pressure to use less because I am a woman, but I can see how some might.