

Experiences of Psychosis and Cannabis

Research Summary



Sex, Gender &
Cannabis Hub

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In this research summary, several terms are used. Psychosis and/or schizophrenia refer to those with clinical symptoms and a diagnosis. Psychotic- or schizophrenia-like experiences are used for non-clinical populations. Psychotic-like deficits is the language used in studies with animals.

KEY MESSAGES

1. Cannabis use may worsen psychotic symptoms, especially among males.
2. Cannabis use is a risk factor for psychotic-like experiences among the general population and for those with a psychotic disorder.
3. Both maternal and paternal cannabis use are associated with an increased risk for psychotic-like experiences in their offspring.
4. Emerging evidence identifies both biological mechanisms and environmental influences related to psychotic-like experiences and psychosis.

INTRODUCTION

This research summary is part of a larger research and knowledge translation project about sex, gender and cannabis use led by the Centre of Excellence for Women's Health and funded by Health Canada. The research methods and other research summaries are posted on the [Sex, Gender and Cannabis Hub](#). While most of the literature considers or studies men and boys and/or women and girls, we include information about all gender groups, including transgender and gender diverse people, when available.

Our 2019 [Sex, Gender and Cannabis](#) report assessed a range of sex- and gender-related factors affecting cannabis use based on literature published prior to 2018. In that report, we found that the age of first episode of psychosis is later in women compared to men but this gap narrows among cannabis users [1]. Some key findings were:

- » A UK study found that males and females with schizophrenia or schizoaffective disorder who used cannabis reported an earlier age of onset of psychotic symptoms than those who did not use cannabis:
 - Age 26 for females who used cannabis, compared to 30.7 for females who did not;
 - Age 25.5 for males who used cannabis, compared to 27 for those who did not [2].
- » A Dutch study reported that among males and females with a psychotic illness, a history of cannabis use was associated with a lower age at onset of first episode of psychosis for both males and females, but males reported earlier onset compared to females regardless of cannabis use [3].
- » Among European adolescents, a decrease in cortical thickness associated with cannabis use was found in males with a higher genetic risk for schizophrenia, but not in males with lower risk or in females [4].

This summary describes evidence from 14 articles from academic literature published between January 2018 and February 2021 related to sex, gender, psychosis/schizophrenia and cannabis use.

SEX, GENDER, PSYCHOTIC-LIKE EXPERIENCES AND CANNABIS USE

Two linked UK studies examined the association between cannabis use and paranoia, psychotic-like experiences, and related distress [5]. They found:

- » In the general population, paranoia, psychotic-like experiences, and linked distress were higher among cannabis-users, with no sex differences in these outcomes. However, childhood sexual abuse among both males and females who use cannabis predicted greater levels of paranoia, psychotic-like experiences and distress [5].
- » Among males and females with psychosis and a history of cannabis use, there were no sex differences in paranoia and psychotic symptoms (as measured by the Prodromal Questionnaire-Brief Version), but males had a higher score for distress [5].

A Dutch study with a population-based birth cohort found that environmental and genetic susceptibilities may increase the risk of psychotic-like experiences among offspring of parents who used cannabis [6].

- » Both maternal and paternal cannabis use were associated with an increased risk for psychotic-like experiences in their children at age 10 [6].
- » Children of mothers who used cannabis prior to pregnancy had similar risks as children of mothers who continued to use cannabis during pregnancy [6].

SEX, FIRST EPISODE OF PSYCHOSIS, AND CANNABIS USE

- » In a Spanish study, reasons for cannabis use such as: to get high, better sleep, increase pleasurable feelings, reduce boredom, satisfy curiosity, and reduce feelings of sadness and depression were similar among males and females with first episode psychosis (FEP). However, females were more likely to smoke cannabis to feel relaxed [7].
- » In a US study of young adults with FEP, there were more males than females (81.5% vs. 18.2% respectively) who continued to use cannabis over a one year period (persistent cannabis users), compared to non-users [8].

Among those who have had FEP, cannabis use may be linked to lower functioning as measured by the Global Assessment of Functioning, among males [7].

- » In a Spanish study of patients experiencing FEP, males who used cannabis had *lower* global functioning than males who did not use cannabis, while females who used cannabis had *higher* global functioning than non-using females [7].

SEX, PSYCHOTIC SYMPTOMS AND CANNABIS

There is some evidence that cannabis use is associated with worsened psychotic symptoms among males. There is also evidence that depressive symptoms may be worsened among females with psychosis who use cannabis, but depression may be reduced in males with psychosis who abstain from cannabis use.

- » Canadian males with schizophrenia or schizoaffective disorder who used cannabis and smoked cigarettes daily, experienced the same psychotic symptoms even after 28 days of abstinence. However, those who abstained had a higher reduction in depression scores compared to those who did not [9].
- » An Italian study found some sex differences in symptoms among patients with cannabinoid-induced psychotic disorder [10]:
 - Males had more intense psychotic symptoms
 - Anxiety and aggression were more prevalent in males
 - Females had a greater preponderance of dysphoria and depressive symptoms
 - There were no sex differences in mania or suicidal ideation [10].

SEX, PSYCHOTIC DISORDERS, THE BRAIN AND CANNABIS USE

Among males and females with a psychotic disorder, there may be sex differences in the effects of cannabis use on brain structures.

- » A Dutch study conducted with non-affective psychotic disorder patients found that cannabis use was associated with lower grey matter volume in male patients. The same association was not found in female patients [11].

SEX, THC EXPOSURE, AND PSYCHOTIC-LIKE DEFICITS IN ANIMALS

Studies with male rats have found that prenatal exposure to tetrahydrocannabinol (THC) may increase the risk of psychotic-like changes to behaviour, cognition [12], and the brain [13]. However, other animal studies have found mixed evidence on the effect of adolescent THC exposure on psychotic-like changes in the brain [14, 15].

SEX, CBD, AND PSYCHOTIC-LIKE DEFICITS IN ANIMALS

Three Australian studies that modeled maternal immune activation to induce schizophrenic-like deficits in rat offspring found a treatment effect of cannabidiol (CBD) on psychotic-like deficits in male [16] and female rat offspring [17], with more mixed evidence among female rat offspring [18].

Summary

In our 2019 [Sex, Gender, and Cannabis](#) report, we found that cannabis use decreases the age of onset of psychotic symptoms. Cannabis seems to increase the levels of paranoia, psychotic-like experiences, and linked distress in both the general population and those with psychosis but does not appear to be a cause-effect relationship as both genetic and environmental factors are involved. Both environmental and genetic susceptibilities to developing psychotic-like experiences have been found for those whose mothers and fathers consumed cannabis in the perinatal period. Nevertheless, male sex is a risk factor for having a first episode psychosis among persistent cannabis users. These limited findings on sex differences, psychosis and psychotic-like experiences highlight the need for more research on how sex and gender-related factors affect the relationship between cannabis use and psychotic disorder and psychotic-like experiences, in order to tailor prevention measures and interventions.

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