

# **Cannabis, Depression, Aggression, Violence and Suicide**

## **An extract from Cannabis: A General Survey of its Harmful Effects**

**Mary Brett updated March 2020**

Cannabis – some very old papers:

Let's take a look at what physicians from a time untainted by politics, drug morality, or profit motive had to say about cannabis risks:

“In large doses it will produce hallucinations, which, in some, are of merriment and in others of a violent nature, even tendency to crime... Its habitual use will cause insanity”

*Materia Medica and Clinical Therapeutics*, by Fred Petersen, published in 1905

The most common effect, however, is the development of insanities which have been known for many years... Chronic mania and dementia represent terminal stages”

*A Textbook of Materia Medica, Pharmacology and Therapeutics*, by George F. Butler, published in 1908

“Repeated use of the drug produces mental weakness and [mental] impotence, the result of over-stimulation.”

*A Compend of Materia Medica, Therapeutics, Prescription Writing: With Especial Reference to the Physiological Actions of Drugs*, by Samuel O.L. Potter, published in 1890

“Sometimes the delirium induced by hemp causes the individual to do deeds of violence, but does not act upon all alike... The after-effects are those of depression.”

*Materia Medica and Therapeutics for Physicians and Students*, by John Biddle, published in 1895

“Hallucinations occur, but they are not usually agreeable; they are often painful and are replaced by stupor... Not unfrequently the excitement takes the form of a furious delirium, in which acts of violence are committed – whence the name ‘haschaschins,’ or assassins, applied to the unfortunate hashish-eater who, under the influence of the drug, commits murder... Dilatation of the pupil, and disorders of vision, which contribute to the hallucinations by distortions of external objects, are produced by hemp”

*A Practical Treatise on Materia Medica and Therapeutics*, by Roberts Bartholow, published in 1893

“There is often a disposition to laugh, sing, shout, or dance, or to do some other extravagant act; but, in other instances, the excitement betrays itself in a quarrelsome temper or deeds of violence...”

Occasionally, a species of intoxication is induced, with hallucinations or complete delirium... Among those who use it habitually, it is said ultimately to impair the mental faculties”

*A Treatise on Therapeutics, and Pharmacology, or Materia Medica*, by George B. Wood, published in 1868

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The association between cannabis use and depression has received much less attention than that between cannabis use and psychosis. It may be that depressed people are less likely to seek treatment than those with psychosis (Degenhardt et al, 2001).

Thomas reported in a review article in 1993, that it was not possible to find scientific proof that cannabis causes a depression of clinical proportions. However he said there was a large body of clinical observations showing that short-lived dysphoric episodes can be provoked by the use of cannabis.

In Andreasson and Allbeck's study of 45,000 Swedish conscripts (1990) exploring relationships between cannabis, schizophrenia and suicide, they concluded that the cannabis indirectly increases the risk of suicide as a result of its ability to precipitate, exacerbate and cause depression and psychosis. In other words, the increasing frequency of suicides in large-scale users was thought to reflect the increased frequency of depression in cannabis abusers.

Weller (1989) compared abusers, users and non-users in outpatients. Fifty-five per cent of the abusers had clinical depression according to the DSM III. Rowe (1995) found an association with marijuana and depression in women. However both these studies have many confounding factors known to be responsible for causing depression e.g. use of alcohol and sedatives, family background with

significantly higher levels of drug abuse, criminal activity and suicide. So a causal connection was impossible to establish.

Data from The US National longitudinal Alcohol Epidemiologic Survey indicated a diagnosis of cannabis use or dependency in the last year was associated with a 6.4 fold increased chance of receiving a diagnosis for major depression in that time (Grant 1995).

Green and Ritter in 2000, in a large drug use survey of men born between 1944 and 1954 found that marijuana users who use the drug to cope with problems are more depressed than those who do not use it to cope with problems.

More recently though, the questions of whether cannabis is a risk factor for causing depression, or depressed people use cannabis to self-medicate has been tackled by Bovasso in 2001. Based on data from 1980, he examined 1920 people in 1995.

“In participants with no baseline depressive symptoms, those with a diagnosis of cannabis abuse at baseline were four times more likely than those with no cannabis abuse diagnosis to have depressive symptoms at the follow-up assessment, after adjusting for age, gender, antisocial symptoms, and other baseline covariates. These symptoms mostly took the form of suicidal thoughts. Among the participants who had no diagnosis of cannabis abuse at baseline, depressive symptoms at baseline failed to significantly predict cannabis abuse at the follow-up assessment”. This last finding was also reported by Kandel et al in 1984 and in 2000 by Kandel et al and McGee et al. In 2005, Hallfors et al also concluded that “Engaging in sex and drug behaviours places adolescents, and especially girls, at risk for future depression”.

JS Brook and others in 2001 published a longitudinal study on over 2000 Colombian adolescents. A clear connection was found between marijuana use and raised levels of anxiety and depression. A prediction can be made of later distress in adolescence if marijuana is used at an early age.

DW Brook and others in 2002 in another longitudinal study found that early marijuana use in childhood and adolescence increased the risk of major depression by 17%. Again the warnings were given of the implications for psychiatric problems later in life because of early use.

Patton and others (2002) followed the progress of 1600 young people, male and female from the age of 14/15 in 1997/8, starting by and large before they had any mental problems or had used drugs. He studied them at 14/15 and again at 21/22. Daily use of cannabis in young women but not men, was linked with an increased risk of between 4 and 5 times in the odds of reporting a state of depression after adjustment for co-founding factors. Weekly use was associated with around a twofold greater risk for depression and the prevalence of the condition increased with higher usage of the drug. They also showed that depression in teenagers did not give rise to an increased cannabis use in early adulthood.

Chen and others (2002) on re-analysing the US National Co-morbidity Survey (NCS), found that those dependent on cannabis at some time in their lives was associated with a 3.4 times greater risk of major depression. And also in 2002 in Australian adolescents a moderate connection was discovered between cannabis use and depression after taking account of other drug use, age and gender. The correlation was most marked in those who had used once or more in the last month (Rey et al, 2002).

2002, Vlahov D et al found that New Yorkers who increased their use of marijuana, tobacco or alcohol after September 11<sup>th</sup> had increased chances of developing Post Traumatic Symptoms. Marijuana increased both PTS symptoms and depression more than the other substances.

Degenhardt et al (2003) reviewed the literature on this subject and produced the following results. “There was a modest association between heavy or problematic cannabis use and depression in cohort studies and well-designed cross-sectional studies in the general population. Little evidence was found for an association between depression and infrequent cannabis use. A number of studies found a modest association between early-onset, regular cannabis use and later depression, which persisted after controlling for potential confounding variables. There was little evidence of an increased risk of later cannabis use among people with depression and hence little support for the self-medication hypothesis. There have been a limited number of studies that have controlled for potential confounding variables in the association between heavy cannabis use and depression. These have found that the risk is much reduced by statistical control but a modest relationship remains”.

Another review was conducted in 2004 by Rey and others. Their results were very similar. “There is growing evidence that early and regular marijuana use is associated with later increases in depression, suicidal behaviour and psychotic illness, and may bring forward the onset of schizophrenia. Most of the recent data reject the view that marijuana is used to self-medicate psychotic or depressive symptoms”.

In a study of 600 same-sex twins, only one of whom was cannabis dependent, it was found that the risk of major depressive disorder was greater in the cannabis dependent twin of fraternal twins; this was not borne out in identical twins (Lynskey et al, 2004).

Other papers indicating a significant association between cannabis use and depressive orders include: Kelder et al (2000), Winokur et al (1998), Troisi et al (1998) and Miller et al (1996).

It is very difficult to determine whether cannabis is associated with violence due to the use of cannabis, withdrawal from the drug, a personality predisposition to violence or indeed because of the illegality. Disputes often arise between drug dealers, users and peers (Arsenault et al 2000). Professor Heather Ashton says in her 1999 review article, ‘Adverse effects of cannabis and cannabinoids’ that “cannabis in most recreational settings decreases aggressive feelings in humans and increases sociability. However, occasional predisposed individuals, especially if under stress, become aggressive after taking cannabis. Violent behaviour may also be associated with acute paranoid or manic psychosis induced by cannabis intoxication”.

Dyer (1996) wrote in the BMJ that, “Drug or alcohol misuse combined with a mental disorder could treble or quadruple the risk of violence”.

Two studies by Kouri and others (1999 and 2002) investigated aggression during withdrawal from cannabis. The Harvard Study in 1999 compared 17 long-term heavy users with 20 infrequent or former smokers. All abstained from the use of cannabis and all other drugs for the duration of the experiment. They were not told that they were being monitored for aggression - temperature and heart rates were measured, so data were not gathered by “self-reporting”. The heavy users showed much more aggression than the controls especially in the first week of abstinence. By day 28 this behaviour had faded.

In the 2002 study they monitored 30 current users and 30 controls (16 former heavy users and 14 light users). There was no difference between the groups to start with except in the ability to concentrate which was worse in the current users. The subjects reported an increase in irritability, anxiety, tension and physical symptoms peaking 7 to 10 days after abstinence. Thus from the 2 studies it can be argued that “aggressive responses of current cannabis users are due to marijuana withdrawal rather than a mere history of marijuana use”.

Fergusson and others during The Christchurch Cohort Study in 1997 when the subjects were aged 16, assessed them for cannabis and violence (assault, fighting, weapon use, threats of violence against another). There was a dose-response relationship with higher cannabis use and an increasing number of violent offences which persisted after controlling for other drug use and peer criminal behaviour, suggesting that deviant peer affiliations are not responsible. In a follow-up at the age of 21 (2002), they found the same association. The link was especially strong in those who had started using early, between 14 and 15 and were regular users (weekly or monthly). An increased frequency in incidents of property or violent crime, depression, suicidal ideation and suicide attempts was observed. The authors pointed out that there was a possibility that pre-existing psychosocial problems may have encouraged cannabis use rather than the other way around so caution must be applied and the results may not indicate a causal explanation for cannabis.

Spunt et al (1994) interviewed 268 people in prison for murder in New York State in 1984. 73 had been under the influence of cannabis at the time and 18 said that the use of cannabis was linked to their crime. When asked, 4 of them said it made them violent and aggressive, one said that when he was high he lost control and another that he doubted he would have done it had he not been under its influence. Four were of the opinion that it lowered their inhibitions and 2 said it made them paranoid. Some who were under the influence of both cannabis and alcohol at the time said the combined effect made them lose self-control.

Twelve cases of aggravated violent crime were looked at in Geneva between 1996 and 2000 (Niveau and Dang, 2003). All the perpetrators were under the influence of only cannabis at the time. Others were discarded because of poly-drug use. Five were previously known to have a personality disorder and three others had psychiatric disorders. All twelve suffered from severe negative effects of cannabis use. Four had an acute psychotic condition, one a relapse into or exacerbation of chronic paranoid psychosis, another 3 had intense anxiety and 3 delirium. The remaining one had a “mood” disorder. There is a growing interest in “dual diagnosis”, ie cannabis use is included as one of the disorders. There is also growing concern about the combination of alcohol and cannabis.

Serious problems of fighting with weapons, window breaking and theft in males and aggressive acts, violent quarrels with teachers, openly cursing or being sent to see the school head in females were all predictors for early cannabis initiation (Pederson et al 2001). Hall JA and others (2003) said that users of cannabis at an early age are at greatest risk of delinquency and violence. They are also most likely to engage in such behaviours before beginning to use cannabis.

Arsenault and others in their “Dunedin Study 2000”, discovered that alcohol dependent individuals were almost twice, marijuana-dependents almost 4 times, and those suffering from schizophrenia spectrum disorder, two and a half times more likely than controls to be violent (Arsenault et al, 2002).

2001 Friedman et al investigated violent behaviour as related to use of marijuana and other drugs. A sample (number 612) of African-American inner city young adults was studied. Unexpectedly, greater frequency of marijuana use was found to be associated with greater likelihood to commit weapons offences. This association was not found with any other drug except alcohol. There was also an association between marijuana and attempted homicide/reckless endangerment offences.

Friedman et al in 2003 found that, for a conventional non-delinquent sub-group, a higher degree of significant relationship between degree of marijuana use and degree of violence occurred, compared to the degree of this type of relationship than was found for either cocaine/crack use, amphetamine use, or tranquilliser/sedative use. In a group that is high on delinquent behaviour, the effect of marijuana was less. Thus, this special disinhibition effect was found only for marijuana and not for the other drugs.

A more recent investigation among 5,500 Dutch adolescents between 12 and 16, found that criminality and aggression increased with increasing use of cannabis. No link was discovered between internalising problems, withdrawal and behaviour. Social factors, regular tobacco smoking and alcohol use were all taken into account. Significant associations were only found in those who had used the drug recently (Monshouwer, 2006)

A series of surveys by PRIDE (Parent Resources and Information on Drug Education USA) and ONDCP (Office of National Drug Control Policies) in 2006 added more evidence of the link between cannabis use and violence.

Of those students who reported carrying a gun to school during the 2005/6 school year, 63.9% had also used marijuana, 39.9% cocaine and 36.8% crystal meth in the past year. (PRIDE Surveys (2006) Questionnaire report for grades 6-12: 2006 National Summary 184).

Of those students who reported hurting others with a weapon at school, 68.4% had used marijuana, 48.3% cocaine and 44.1% crystal meth in the past year. (PRIDE surveys 2006 etc 197)

The incidences of youth physically attacking others, stealing, and destroying property increased in proportion to the number of days marijuana was smoked in the past year. Marijuana users were twice as likely as non-users to report they disobeyed school rules. (Office of National Drug Control Policy 2006 *Marijuana Myths and Facts: The Truth Behind 10 Popular Misperceptions 10*).

Of those students who reported threatening someone with a knife, gun or club, or threatening to hit, slap or kick someone in the school year 2005/6, 27% had used marijuana, 7.8% cocaine and 6.2% crystal meth in the past year ( PRIDE surveys (2006) etc 194).

During the school year 2005/6, 39.6% of those in trouble with the police used marijuana, 12.2% cocaine and 9% crystal meth in the past year ( PRIDE surveys (2006) etc 195).

PRIDE surveys are available: <http://www.pridesurveys.com/customercenter/us05ns.pdf>.

In a Welsh study of 740 identical and non-identical twins, it was found that, while the environment played a part in the development of cannabis use disorder in those with conduct disorder, genetics had a significant influence. Therefore the absence/presence of a conduct disorder in a twin pair is a good

predictor of cannabis use. The findings suggest that cannabis use and violence to some extent co-occur due to personality tendencies (Miles et al, 2002).

Other researchers to find a connection between cannabis and violent behaviour are: Resnick et al, 1997, Dornbusch et al, 1999, Friedman, 1996 and White, 1998.

A 1995 (Fugelstad et al) Swedish study looked at suicides. In a study of 53 people who jumped from a great height, 11% were under the influence of cannabis, a disproportionate number. They calculated that a cannabis smoker is 18.7 times more likely to take his own life by jumping than a non-smoker. The number of cannabis-related suicides, in comparison with suicides related to the use of other drugs, users of heroin, amphetamines or alcohol, was much higher and none of them jumped from high places or committed murder before taking their own lives. No homicides were carried out by the users of other drugs who committed suicide.

Beautrais et al (1999) found only a very limited independent association between cannabis and suicide but indicated the indirect link by way of psychosis and depression, both of which can increase suicide rates.

2001 Friedman et al investigated violent behaviour as related to use of marijuana and other drugs. A sample (number 612) of African-American inner city young adults was studied. Unexpectedly, greater frequency of marijuana use was found to be associated with greater likelihood to commit weapons offences. This association was not found with any other drug except alcohol. There was also an association between marijuana and attempted homicide/reckless endangerment offences.

The Australian News on November 25<sup>th</sup> 2002 reported a “Marijuana suicide epidemic” among the Aborigines in The Northern territories. In one community of 650 people, 30 suicide attempts related to cannabis were made in one year, in one month period, 3 succeeded. It appeared that they were buying marijuana, mixing it with alcohol and becoming paranoid.

Research was carried out in the Caribbean island of Trinidad where there is an established use of cannabis and high suicide rates. “Depression and psychotic experiences were common findings in adolescent cannabis users with a significant preponderance of depressive experiences. Our findings suggest that there is a convincing relationship between suicidal behaviour and cannabis use” (Maharajh and Konings, 2005).

Heavy cannabis use and depression were linked in a study on 3 Aboriginal communities in Arnhem Land in the Northern Territory in May 2008 by Lee and others. “After adjusting for other substance use (tobacco, alcohol and lifetime petrol sniffing) age and sex, heavy cannabis users were 4 times more likely than the remainder of the sample (106 individuals) to report severe depressive symptoms”.

There have been numerous reports in the press linking cannabis with violent incidents and suicide. These are a few examples:

A wealthy 52 year-old music producer was attacked in her home by a 20 year-old family friend made psychotic by the drug. She had to have 11 operations to rebuild her face. At the time doctors warned she would likely die (The Times 5/02/06). A judge attacked the use of cannabis after a 25 year-old professional golfer with a history of cannabis smoking killed his grandmother and aunt in a frenzied attack (Daily Mail 25/11/03). A coroner blamed cannabis for 2 deaths after a long-running feud over a hedge. A 52 year-old man grew his own supplies in his attic and had become addicted after smoking between 5 and 10 cannabis cigarettes a day. He shot his 66 year-old neighbour then committed suicide a week later in prison (Daily Mail 16/01/04). A teenager stabbed himself to death in the chest with scissors in front of his helpless father, he thought he was invincible. He had previously threatened his sister and girlfriend (Daily Mail 28/02/02). Then there was the well-publicised case of Luke Mitchell, 16 who slashed and killed his 14 year-old girl friend Jodi Jones in Scotland. He told his psychiatrist he smoked 600 joints a week (Daily Mail 12/02/05).

Britain’s most senior coroner, Hamish Turner, issued warnings in various papers in November 2003 that hundreds of young people are dying because of prolonged use of cannabis. He claimed that, over the last year, of the 100 deaths he had dealt with, 10% had a significant link to the drug (Daily Mail 3/11/03).

A 22 year-old nurse smoked cannabis for 5 years, became very depressed and hung himself in his bedroom (Daily Mail 12/06/05). A student hung himself after developing a mental illness induced by the use of cannabis. He left a suicide note which read, "Cannabis has ruined my life" (The Times 9/09/03). James Taylor hanged himself in his Torquay flat after smoking cannabis since he was 15. He suffered mental health problems and depression (Daily Mail 3/11/03).

I recently met a nurse from a GP Practice. She said, "If only people could come in and look at the records. The number of our young patients they would see who have as their priority condition: "Marijuana-induced depression, Marijuana-induced psychosis or Marijuana-induced schizophrenia, would really bring the problem home to them. They would not believe it. This is a huge problem".

"Teens Drugs and Violence", a special report from the Office of National Drug Control Policy in the USA, in June 2007 concluded that "Early use of marijuana – the drug most widely used by teens – is a warning sign for later gang involvement" and "Teens who participate in gangs are more likely to be involved in violent acts and drug use". "Teens who report current and regular marijuana use are 9 times more likely than non-users to experiment with other illegal drugs or alcohol, and five times more likely to steal....Children who use marijuana are nearly four times more likely to join gangs. Being a member of a gang dramatically increases a teen's risk of being a victim of violence, not just a perpetrator".

A possible mechanism for cannabis-induced violence was found in a paper by Howard and Menkes in October 2007. Five habitual cannabis users were given a reefer containing 11mg of THC. An electrocortical measure of affective impulsivity, Go/No Go contingent negative variation was carried out during and after smoking. Slow brain potentials developed normally in both Go/No Go conditions before and during smoking but were severely disrupted 20 to 30 minutes later – peak intoxication! (The effects were said to resemble those occurring in patients with lateral prefrontal cortex lesions). Larger scale studies were called for.

In 2009 Dr Gabriella Gobbi found that teenage cannabis users have decreased serotonin transmission leading to mood disorders, and increased norepinephrine transmission which leads to greater long-term susceptibility to stress. She said, "Our study is one of the first to focus on the neurobiological mechanisms at the root of this influence of cannabis on depression and anxiety in adolescents." It is also the first to demonstrate that cannabis causes more serious damage during adolescence than adulthood.

2010 Fazel and others conducted a study into bipolar disorder and violent crime. Participants were: individuals with 2 or more discharge diagnoses of bipolar disorder (n =3743), general population controls (n = 37,429) and unaffected full siblings of individuals with bipolar disorder (n = 4059) 314 individuals with bipolar disorder (8.4%) committed violent crime compared to 1312 general population controls (3.5%). The risk was mostly confined to patients with substance abuse co-morbidity, and minimal in patients without substance use comorbidity. This was further attenuated when the unaffected full siblings were used as controls. They concluded, 'Although current guidelines for the management of individuals with bipolar disorder do not recommend routine risk assessment for violence, this assertion may have to be reviewed in patients with comorbid substance abuse'.

2010 de Graaf et al looked at early cannabis use and depression. They concluded: The overall association was modest (controlled for sex and age), was statistically robust in 5 countries, and showed no sex difference. The association did not change appreciably with statistical adjustment for mental health problems, except for childhood conduct problems, which reduced the association to non significance. This study did not allow differentiation of levels of cannabis use; this issue deserves consideration in future research.

2011 Otten et al found that cannabis smoking increases the risk of depression in the case of genetic vulnerability. Data were collected over 5 years from 428 families and their 2 adolescent children in Holland. In young people with a variant of the gene 5-HTT cannabis use led to an increase in depressive symptoms. The effect was still 'robust' even accounting for alcohol use, smoking, upbringing, socio-economic status or personality.

Daily Mail Tuesday September 28<sup>th</sup> 2010 reported the case of a public schoolboy, hooked on cannabis, who stabbed his best friend 13 times and left him for dead. Harry Schick, 17, was locked up for 9 years. The boy, Gavin Doyle, was able to dial 999 and was rescued from woods by a helicopter with heat-seeking equipment. He is still experiencing problems from wounds to his hands. "Schick had no

history of violence though his psychiatric report said that his heavy use of cannabis had led him to become distanced from reality”.

2012 August Fergusson et al looked at The Christchurch Health and Development Study (1265 NZ children born in 1977 and studied at 4 months, 1 year, then yearly till age of 16, then at 18, 21, 25 and 30). These research findings were presented at The Second national Cannabis Conference in Brisbane on September 20th 2012. Not only did cannabis use precipitate suicidal thoughts but the higher the frequency of regular use, the faster susceptible individuals became suicidal. If all males used cannabis less frequently than several times/week, suicidal ideation would be experienced by 15% of 18 year olds, 24% of 21 year olds and 30% of 30m year olds. If they had all started using cannabis several times a week from the age of 17, then all males would show an increase of 24% of 18s and 31% for 21s.

2012 November Sheehan and others looked at gender differences in the presence of drugs in violent deaths. Conclusions: Suicide and homicide decedents are characterized by varying patterns of licit and illicit drug use that differ by gender. Drugs associated with homicides (marijuana, cocaine and amphetamines) are stronger among males, while drugs associated with suicide are stronger among females (antidepressants and opiates). Taking these differences into consideration may allow for targeted interventions to reduce violent deaths.

2012 Reingle et al looked at the relationship between marijuana use and intimate partner violence. Abstract: Intimate partner violence is a significant public health problem, as these behaviors have been associated with a number of negative health outcomes including illicit drug use, physical injury, chronic pain, sexually transmitted diseases, depression, and posttraumatic stress disorder. The current study examined the association between marijuana use and intimate partner violence using a longitudinal survey of adolescents and young adults ages 15 to 26 years. Data were obtained from 9,421 adolescents in the National Longitudinal Study of Adolescent Health (Add Health) Waves 1 through 4 (1995-2008). Marijuana use was measured in the past year at each wave and participants were categorized as "users" or "nonusers." Partner violence was constructed using six items (three pertaining to victimization and three concerning perpetration) from Wave 4 (2007-2008). Using these six items, participants were categorized as "victims only," "perpetrators only," or "victims and perpetrators." Survey multinomial regression was used to examine the relationship between marijuana use and intimate partner violence. Consistent use of marijuana during adolescence was most predictive of intimate partner violence (OR = 2.08,  $p < .001$ ). Consistent marijuana use (OR = 1.85,  $p < .05$ ) was related to an increased risk of intimate partner violence perpetration. Adolescent marijuana use, particularly consistent use throughout adolescence, is associated with perpetration or both perpetration and victimization by intimate partner violence in early adulthood. These findings have implications for intimate partner violence prevention efforts, as marijuana use should be considered as a target of early intimate partner violence intervention and treatment programming.

2013 Smith et al reported that laboratory-based increases in aggression due to marijuana withdrawal extend to the general population of marijuana users who have a previous history of aggression.

2013 Wong and others looked at clinical implications of substance use on suicidality among youths. Data from The Youth Risk Behaviour Survey from 2001 to 2009 were used to analyse the correlation between lifetime use of 10 common substances of abuse – heroin, alcohol, cocaine, ecstasy, hallucinogens, methamphetamines, steroids, tobacco, inhalants, marijuana. The study controlled for multiple co-founders. The key findings concluded that a history of all substance abuse is a strong and independent risk factor for adolescent suicide ideation, and plans, and attempts – even after controlling for eg depression, eating disorders, interpersonal violence etc. 4.1% of adolescents who reported at least once /lifetime marijuana use made a suicide attempt that required medical attention compared with 0.89% who reported never using marijuana. The greater the number of substances used, the more attempts were made.

2013 Brook et al looked at the relationship of marijuana use from adolescence to adulthood and the use of weapons including guns. African Americans and Puerto Ricans (838). There was a higher probability of engagement in violence (shooting or hitting with a weapon) among those with increasing marijuana use, moderate use and the quitter group than those with no use.

2014 SAMHSA ( Substance Abuse and Mental Health Services Administration) in the USA 2012 Survey of Drug Use and Health (70,000 individuals age 12 or over) found that adults using illicit drugs are significantly more likely to contemplate suicide than the general adult population. 3.9% of US adults in a given year (9m) have serious thoughts of suicide . This rises to 9.4% of those who use illicit drugs. This varied with the type of drug used. Sedatives produced a 21% rise, opioid pain relievers 13% and marijuana 10%.

2014 Zang and Wu found that ideation of suicide and substance abuse among adolescents and young people increased the risk of illicit drug use. 3342 people were tested on 4 occasions from 1995 to 2009. Their conclusion, 'Use of cigarette or alcohol increased risk of suicidal ideation, while suicidal ideation was not associated with cigarette or alcohol use. Reverseely, drug use (marijuana and other drugs) did not increase risk of suicidal ideation, but suicidal ideation increased risk of illicit drug use'.

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2014 Cairns et al studied risk and protective factors for depression in a systematic review and meta-analysis. 113 publications were identified (longitudinal studies of 12-18 year olds) which met the criteria. They concluded that future health education campaigns should aim to reduce substance abuse (alcohol, tobacco, cannabis, other illicit drugs, and polydrug use); dieting; other negative coping strategies; and to promote heathy weight; diet and sleep patterns.

2015 Jan. Ansell et al found hostility and impulsivity among marijuana users in daily life. Forty three participants with no substance dependence reported on their alcohol consumption, tobacco use, recreational marijuana use, impulsivity, and interpersonal hostility in others over 14 days. Marijuana use was associated with increased impulsivity on the same day and the following day relative to days when marijuana was not used, independent of alcohol use. Marijuana was also associated with increased hostile behaviors and perceptions of hostility in others on the same day when compared to days when marijuana was not used. These effects were independent of frequency of marijuana use or alcohol use. There were no significant effects of alcohol consumption on impulsivity or interpersonal hostility.

**CONCLUSIONS:** Marijuana use is associated with changes in impulse control and hostility in daily life. This may be one route by which deleterious effects of marijuana are observed for mental health and psychosocial functioning. Given the increasing prevalence of recreational marijuana use and the potential legalization in some states, further research on the potential consequences of marijuana use in young adults' day-to-day life is warranted.

2015 Moitra et al investigated depression in female emerging adults. 332 emerging female adults (18-25 years) were studied for changes in depressive symptoms in relation to changes in cannabis use at 3 months and 6 months. Changes were significantly stronger for those with mild and moderate and more severe depression relative to those with minimal depression. Reduction in depression correlates with reduction in cannabis use.

2015 Kylie et al looked at cannabis use and violence among 3 Aboriginal Australian communities. 264 random individuals between 14 and 42 were selected. Physical trauma presentations between June 2004 and June 2006 were used. One in 3 of them (88) presented with physical trauma. The majority (58) had at least one presentation that was violence-related. Nearly 2 in 3 of the total presentations for trauma following violence involved the use of a weapon, hunting tools, wooden or rock implements. Individuals who reported any current cannabis use were nearly 4 times more likely than non-users to present at least once for violent trauma, after adjusting for alcohol, age and sex.

2015 Pardini et al examined the linkages with criminal behaviour and psychopathic features of males into the Mid 30s. Chronic high and late-increasing marijuana users exhibited more adult psychopathic features and were more likely to engage in drug-related offending in the mid-30s than low/non-users. Adolescence-limited users were similar to non/low users in terms of psychopathic features but more likely to be arrested for drug-related crime.

2015 Wilkinson et al looked at marijuana use in patients with PTSD. They found, after relevant baseline co-variants that marijuana use was significantly associated with worse outcomes in PTSD symptom severity, violent behaviour, and measures of drug and alcohol abuse, compared to those who stopped (used at admission but not after discharge) and never-users. Those two groups also had the lowest levels of PTSD symptoms at follow-up, while starters (used after discharge but not at admission) had the highest levels of violent behaviour.

2016 Rodway et al looked at suicides in young people.

Findings: '145 suicides in people younger than 20 years were notified to us during the study period (January 1<sup>st</sup> 2014 – April 30<sup>th</sup> 2015), of which we were able to obtain report data about antecedents for 130 (90%). The number of suicides rose sharply during the late teens with 79 deaths by suicide in people aged 18–19 years compared with 66 in people younger than 18 years. 102 (70%) deaths were in males. 92 (63%) deaths were by hanging. Various antecedents were reported among the individuals for whom we had report data, including academic (especially exam) pressures (35 [27%] individuals), bullying (28 [22%]), bereavement (36 [28%]), suicide in family or friends (17 [13%]), physical health conditions (47 [36%]), family problems (44 [34%]), social isolation or withdrawal (33 [25%]), child abuse or neglect (20 [15%]), excessive drinking (34 [26%]), and illicit drug use (38 [29%]). Suicide-related internet use was recorded in 30 (23%) cases. In the week before death 13 (10%) individuals had self-harmed and 35 (27%) had expressed suicidal ideas. 56 (43%) individuals had no known contact with health-care and social-care services or justice agencies.

2016 Schoeler et al looked at continuity of cannabis use and violent offending over the life course. The study (The Cambridge Study in Delinquent Development) involved 411 boys all born around 1953, raised in working class urban areas in London, 97% were Caucasian and all were raised in 2-parent households. Researchers controlled for a number of factors, including antisocial traits e.g. alcohol or other drug use, cigarette smoking, mental illnesses and family history etc. Most of the participants never used cannabis and they were never reported to have violent behavior. 38% of the participants did try cannabis at least once in their life. Most of them experimented with cannabis in their teens, but then stopped using it. However, 20% of the boys who started using pot by age 18 continued to use it through middle age (32-48 years). One fifth of those who were pot smokers (22%) reported violent behavior that began after beginning to use cannabis, whereas only 0.3% reported violence before using weed. Continued use of cannabis over the life-time of the study was the strongest predictor of violent convictions, even when the other factors that contribute to violent behavior were considered in the statistical analysis. In conclusion, the results show that continued cannabis use is associated with a 7-fold greater odds for subsequent commission of violent crimes. This level of risk is similar to the increased risk of lung cancer from smoking cigarettes over a similar duration (40 years). The authors suggest that impairments in neurological circuits controlling behavior may underlie impulsive, violent behavior, as a result of cannabis altering the normal neural functioning in the ventro-lateral prefrontal cortex.

2016 Shalit looked at the association between cannabis use and suicidality among men and women. They found that cannabis use, especially daily use, was significantly associated with increased incidence of suicidality among men but not among women. Conversely basal suicidality was associated with initiation of cannabis use among women but not men.

2016 Wright et al investigated marijuana use, behavioural approach and depressive symptoms in adolescents and young adults. 84 participants, 42 (MJ) users and 42 controls aged 18-25 were balanced for gender. MJ group predicted increased depressive symptoms. Decreased fun-seeking, reward response, were predicted by MJ group. Gender predicted decreased reward responsiveness in females and decreased BIS in females. Female marijuana users had increased anxiety symptoms and increased disinhibition. Increased cotinine predicted increased drive and reward responsiveness. Apathy and Executive Dysfunction were not predicted by any measures. All results had small effect sizes.

2016 Mok et al looked at parental psychiatric disease and risks of attempted suicide and violent criminal offending in offspring. All persons born in Denmark 1967 – 1997 were followed from their 15<sup>th</sup> birthday till occurrence of adverse outcome or December 31<sup>st</sup> 2012 whichever came first. '1 743 525 cohort members (48.7% female) Risks for offspring suicide attempt and violent offending were elevated across virtually the full spectrum of parental psychiatric disease. Incidence rate ratios were the most elevated for parental diagnoses of antisocial personality disorder (suicide attempt, risk 3.96 times; violent offending, 3.62 times; and cannabis misuse (suicide attempt, 3.57 times risk;

violent offending, 4.05; and for parental suicide attempt (suicide attempt, 3.42;; violent offending, 3.31 times. Parental mood disorders (and bipolar disorder in particular) conferred more modest risk increases. A history of mental illness or suicide attempt in both parents was associated with double the risks compared with having just 1 affected parent. Associations between parental psychiatric disease and offspring violent offending were stronger for female than for male offspring, whereas little sex difference in risk was found for offspring suicide attempt'. Early interventions to tackle parental mental disorders may be beneficial to both parents and children.

2017 Kimbrel et al looked at suicide attempts in Iraq/Afghanistan veterans. 'The objective of the present research was to examine the association between lifetime cannabis use disorder (CUD), current suicidal ideation, and lifetime history of suicide attempts in a large and diverse sample of Iraq/Afghanistan-era veterans (N = 3233) using a battery of well-validated instruments. As expected, CUD was associated with both current suicidal ideation and lifetime suicide attempts, even after accounting for the effects of sex, posttraumatic stress disorder, depression, alcohol use disorder, non-cannabis drug use disorder, history of childhood sexual abuse, and combat exposure. Thus, the findings from the present study suggest that CUD may be a unique predictor of suicide attempts among Iraq/Afghanistan-era veterans; however, a significant limitation of the present study was its cross-sectional design.

2017 Gates et al investigated substance use, mental health disorders in prison and suicides. Abstract: Substance use disorders (SUD) and mental health disorders are significant public health issues that co-occur and are associated with high risk for suicide attempts. SUD and mental health disorders are more prevalent among offenders (i.e., prisoners or inmates) than the non-imprisoned population, raising concerns about the risk of self-harm. This cross-sectional study examined the population of a state prison system (10,988 out of 13,079) to identify associations among SUD (alcohol, cannabis, intravenous drugs, narcotics, and tobacco smoking), mental health disorders (anxiety, bipolar, depression, and psychotic disorders), and suicide attempts. The primary aim was to determine which groups (SUD, mental health disorders, and co-occurrences) were strongly associated with suicide attempts. Groups with a documented SUD or mental health disorders compared to peers without these issues had 2.0 and 9.2 greater odds, respectively, for attempting suicide, which was significant for both conditions. There were also significant differences within SUD and mental health disorders groups in regard to suicide attempts. Groups with the greatest odds for suicide attempts were offenders with comorbid bipolar comorbid and anxiety, alcohol combined with depression, and cannabis co-occurring with depression. Documentation of suicide attempts during imprisonment indicates awareness, but also suggest a need to continue enhancing screening and evaluating environmental settings'.

2017 Guimaraes et al looked at criminal behaviour among illicit drug users (IDU). ' A Cross-sectional study carried out with IDU undergoing treatment for chemical dependence. Of the total participants (n = 274), 46.7%, 15.7%, and 10.9% reported involvement in robbery, drug trafficking and homicide, respectively. Robbery was associated with young age, withdrawal symptoms, prison record, sex work, and crack use, while drug trafficking was associated with young age, low education, and marijuana use. Homicides were associated with cocaine and marijuana use'.

2017 Coentre et al examined suicidal behaviour and depression after first-episode psychosis. 'Depressive symptoms and suicidal behavior are common among patients that suffered a first-episode psychosis.. We included 19 studies from 12 countries, 7 studied depressive symptoms and 12 suicidal behavior. The findings confirm that depressive symptoms and suicidal behavior have high rates in the years after first-episode psychosis. .... Suicidal behavior was associated with previous suicide attempt, sexual abuse, comorbid polysubstance use, lower baseline functioning, longer time in treatment, recent negative events, older patients, longer duration of untreated psychosis, higher positive and negative psychotic symptoms, family history of severe mental disorder, substance use, depressive symptoms and cannabis use. Data also indicate that treatment and early intervention programs reduce depressive symptoms and suicidal behavior after first-episode psychosis'

2017 Bahorik et al looked at patterns of marijuana use among psychiatry patients with depression and its impact on recovery. Participants were 307 psychiatry outpatients with depression and past-month marijuana use. Longitudinal growth models examined patterns and predictors of marijuana use and its impact on symptom and functional outcomes. A considerable number of (40.7%; n=125) patients used marijuana within 30-days of baseline. Over 6-months, marijuana use decreased , but patterns varied by

demographic and clinical characteristics. Depression symptoms contributed to increased marijuana use over the follow-up, and those aged 50+ increased their marijuana use compared to the youngest age group. Marijuana use worsened depression and anxiety symptoms; marijuana use led to poorer mental health functioning. Medical marijuana was associated with poorer physical health functioning.

2017 Guvendiger et al looked at suicide attempts with substance abuse among those seeking treatment for cannabis use disorder. 'Numerous studies in youth and adults suggest strong association between substance use disorders and non-suicidal self-injury (NSSI) and suicidal behaviors. There is paucity of studies exploring the association of substance use with history of suicide attempts (HSA) and NSSI in children and adolescents in Turkey.

Participants were children and adolescents who were admitted to the Bakirkoy Trainee and Research Hospital for Psychiatric and Neurologic Disorders in Istanbul between January 2011 and December 2013. Two thousand five hundred eighteen participants were included. Questionnaires were applied to all patients. The association of NSSI and HSA with substance use, family characteristics, and subject characteristics were analyzed. The prevalence of NSSI and HSA behaviors among substance using youth in our sample were 52% and 21% respectively. Cannabis and cocaine use was found to be a significant risk factor for HSA, and polysubstance use was associated with both NSSI and HAS'.

2017 Miller et al looked at marijuana, violence and the law. Abstract:

'Marijuana is currently a growing risk to the public in the United States. Following expanding public opinion that marijuana provides little risk to health, state and federal legislatures have begun changing laws that will significantly increase accessibility of marijuana. Greater marijuana accessibility, resulting in more use, will lead to increased health risks in all demographic categories across the country. Violence is a well-publicized, prominent risk from the more potent, current marijuana available. We present cases that are highly popularized storylines in which marijuana led to unnecessary violence, health risks, and, in many cases, both. Through the analysis of these cases, we will identify the adverse effects of marijuana use and the role it played in the tragic outcomes in these and other instances. In the analysis of these cases, we found marijuana as the single most common, correlative variable in otherwise diverse populations and circumstances surrounding the association of violence and marijuana.

2017 Johnson et al investigated marijuana use and physical dating violence (PDV) among adolescents and emerging adults. They conducted a systematic review of the relevant literature between 2003 and 2015. 13 articles examined marijuana in association with PDV 5 addressed victimisation and 11 perpetration. They suggested that marijuana use is associated with an increase in the odds of PDV victimisation and 45% increase in odds of perpetration.

2017 Orpinas et al looked at perpetration of physical dating violence (PDV) 7-year associations with suicidal ideation, weapons and substance abuse. The Healthy Teens Longitudinal Study followed 588 randomly selected students adolescents from grades 6 – 12. They completed a self-reported computer-based survey every spring. Across most grades, Significantly more students in the 'Increasing' trajectory for PDV rather than 'Low' trajectory, reported suicidal ideation, carried a weapon and threatened someone with a weapon. Ehy also had higher trajectories of alcohol use, being drunk and marijuana use than the low trajectory. All differences were already significant in grade 6. So behaviour problems – PDV, suicide ideation and attempts, weapon carrying and threats, marijuana and alcohol use cluster together as early as 6<sup>th</sup> grade and persist over time.

2017 Rhew et al investigated early adolescent depression and the increased risk of cannabis and alcohol abuse. 521 youths from 12 to 15 were evaluated annually from sixth to ninth grade and again at 18 years. At age 18, 20.9% of the cohort reported past-year cannabis use disorder and 19.8% reported past-year alcohol use disorder. One standard deviation increase in cumulative depression during early adolescence was associated with a 50% higher risk for cannabis use disorder. A similar association occurred between adolescent depression and alcohol use disorder but did not reach statistical significance.

2017 Agrawal et al looked at major depressive disorder, suicidal thoughts and behaviours, and cannabis involvement in discordant twins. 'In 13 986 twins (6181 monozygotic and 7805 dizygotic), cannabis use ranged from 1345 (30.4%) of 4432 people in sample 1 to 2275 (69.0%) of 3299 in sample 3. Mean age of first cannabis use ranged from 17.9 years (SD 3.3) in sample 3 to 21.1 years (5.2) in sample 1, and frequent use ( $\geq 100$  times) was reported by 214 (15.9%) of 1345 users in sample 1 and 499 (21.9%) of 2275 in sample 3. The prevalence of suicidal ideation ranged from 1102 (24.9%) of 4432 people in sample 1 to 1644 (26.3%) of 6255 people in sample 2 and 865 (26.2%) of 3299 people in sample 3.

Prevalence of MDD ranged from 901 (20.3%) people in sample 1 to 1773 (28.3%) in sample 2. The monozygotic twin who used cannabis frequently was more likely to report MDD (odds ratio 1.98, 95% CI 1.11–3.53) and suicidal ideation (2.47, 1.19–5.10) compared with their identical twin who had used cannabis less frequently, even after adjustment for covariates. For early cannabis use, the monozygotic point estimate was not significant but could be equated to the significant dizygotic estimate, suggesting a possible association with suicidal ideation’.

2017 Borges et al looked at alcohol, cannabis etc and subsequent suicide ideation and attempt among young Mexicans. “We estimated prospective associations of substance use as a risk factor for incident suicide ideation and attempt, from a follow-up conducted in 2013 (n = 1071) of the original Mexican Adolescent Mental Health Survey conducted in 2005. RESULTS:

Cannabis use before age 15 (ideation risk ratio RR) = 3.97; (attempt RR) = 5.23; early onset of DSM-IV drug use disorder (DUD) among cannabis users (ideation RR = 3.30); (attempt RR = 4.14); high frequency of cannabis use (RR for attempts = 4.60); and recent DSM-IV-DUD among cannabis users (RR for attempts = 4.74); increased the RR. For "other drug use", significant results were found among those with high frequency use of other drugs such that they had a higher RR of suicide attempt (5.04). For alcohol, only those who initiated alcohol before age 15 had higher RRs of suicide attempt (1.79);

Those who used cannabis at an early age, early onset of DSM-IV-DUD, and those with heavy cannabis use and recent DSM-IV-DUD among cannabis users in the last 12-months had increased risk of suicide ideation and attempt. Drugs other than cannabis showed some of these associations, but to a lesser degree”.

2017 Dierker et al looked at depression and marijuana use disorder symptoms among current marijuana users. ‘Depression is one of the most consistent risk factors implicated in both the course of escalating substance use behaviors and in the development of substance dependence symptoms, including those associated with marijuana use. In the present study, we evaluate if depression is associated with marijuana use disorder symptoms across the continuum of marijuana use frequency. Data were drawn from six annual surveys of the National Survey of Drug Use and Health to include adults who reported using marijuana at least once in the past 30days (N=28,557). After statistical control for sociodemographic characteristics and substance use behaviours including marijuana use, alcohol use, smoking, and use of illicit substances other than marijuana, depression was positively and significantly associated with each of the marijuana use disorder symptoms as well as the symptom total score. Adult marijuana users with depression were consistently more likely to experience marijuana use disorder symptoms and a larger number of symptoms, with the magnitude and direction of the relationship generally consistent across all levels of marijuana use frequency from 1day used in the past month to daily marijuana use’.

2017 Dugre et al looked at the persistency of cannabis use predicting violence following acute psychiatric discharge. ‘Violence is a major concern and is prevalent across several mental disorders. The use of substances has been associated with an exacerbation of psychiatric symptoms as well as with violence. Compared to other substances such as alcohol and cocaine, existing literature on the cannabis–violence relationship has been more limited, with most studies being conducted in the general population, and has shown controversial results. Evidence has suggested a stronger relationship when examining the effects of the persistency of cannabis use on future violent behaviors. Though, while cannabis use is highly prevalent amid psychiatric patients, far less literature on the subject has been conducted in this population. Hence, the present prospective study aims to investigate the persistency of cannabis use in psychiatric patients. The sample comprised of 1,136 recently discharged psychiatric patients provided by the MacArthur Risk Assessment Study. A multi-wave (five-assessment) follow-up design was employed to allow temporal sequencing between substance use and violent behaviors. Generalized estimating equations (GEE) were used to examine the effect of persistency of cannabis use on violence, while controlling for potential confounding factors. Potential bidirectional association was also investigated using the same statistical approach. Our results suggest a unidirectional association between cannabis use and violence. GEE model revealed that the continuity of cannabis use across more than one time wave was associated with increased risks of future violent behavior. Patients who reported having used cannabis at each follow-up periods were 2.44 times more likely to display violent behaviors (OR = 2.44, 95% CI: 1.06–5.63,  $p < 0.05$ ). These findings are particularly relevant as they suggest that the longer individuals report having used cannabis after a psychiatric discharge, the more likely they are of being violent in the following time waves. These results add to our understanding of the negative consequences of chronic cannabis use amid psychiatric patients’.

2018 Dawson et al investigated violent behaviour by emergency department patients with an involuntary hold status. Abstract: Retrospective review of patients evaluated during an involuntary hold at a suburban acute care hospital ED from January 2014 through November 2015. Of 251 patients, 22 (9%) had violent incidents in the ED. Violent patients were more likely to have a urine drug screen positive for tricyclic antidepressants (18.2% vs 4.8%,  $P=0.03$ ) and to present with substance misuse (68.2% vs 39.7%,  $P=0.01$ ), specifically with marijuana (22.7% vs 9.6%,  $P=0.06$ ) and alcohol (54.5% vs 24.9%,  $P=0.003$ ). ED readmission rates were higher for violent patients (18.2% vs 3.9%,  $P=0.02$ ). No significant difference was found between violent patients and nonviolent patients for sex, race, marital status, insurance status, medical or psychiatric condition, reason for involuntary hold, or length of stay.

2018 Pro et al Looked at microaggressions and marijuana use among college students. Abstract: This study examines the association between exposure to microaggressions and marijuana use, using original survey data from a sample of racial/ethnic minority college students ( $n = 332$ ) from a large Division I university in the United States. Nearly all of our sample (96%) reported at least one experience with microaggressions in the past 6 months, while 33% reported using marijuana regularly. We modeled regular use of marijuana using multiple logistic regression, with consideration of sex, age, race/ethnicity, and microaggression scale scores as covariates. Age, sex, the microinvalidations subscale score, and the full microaggression scale score were significantly associated with marijuana use in our full models ( $p < .01$ ;  $p = .01$ ;  $p = .02$ ;  $p = .03$ , respectively). With each additional experience of microaggression, the odds of regular marijuana use increase. Academic communities may consider the primary prevention of discriminatory behavior when addressing student substance use.

2018 Subramaniam et al Studied orbo-frontal connectivity and its association with depression and anxiety in marijuana using adolescents. Abstract: Prevalence of marijuana (MJ) use among adolescents has been on the rise. MJ use has been reported to impact several brain regions, including frontal regions such as the orbitofrontal cortex (OFC). The OFC is involved in emotion regulation and processing and has been associated with symptoms of depression and anxiety. Therefore, we hypothesized that adolescent MJ users would show disruptions in OFC connectivity compared with healthy adolescents (HC) which would be associated with symptoms of mood and anxiety. 43 MJ-using and 31 HC adolescents completed clinical measures including the Hamilton Anxiety Scale (HAM-A) and Hamilton Depression Rating Scale (HAM-D). Resting-state functional magnetic resonance imaging data was also acquired for all participants. In MJ users, increased depressive symptoms were associated with increased connectivity between the left OFC and left parietal regions. In contrast, lower ratings of anxiety were associated with increased connectivity between right and left OFC and right occipital and temporal regions. These findings indicate significant differences in OFC connectivity in MJ-using adolescents, which correlated with mood/anxiety. Future studies with an increased number of female participants is required to address potential sex differences in connectivity patterns related to symptoms of depression and anxiety. This study highlights the association between OFC connectivity, MJ use, and symptoms of depression and anxiety in adolescents. These findings provide further insight into understanding the neural correlates that modulate the relationship between comorbid MJ use and mood disorders and could potentially help us better develop preventive and treatment measures.

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comorbid MJ use and mood disorders and could potentially help us better develop preventive and treatment measures.

2019 Chadi et al investigated depressive symptoms and suicidality in adolescents using e-cigarettes and marijuana. Abstract: E-cigarette use has increased dramatically among adolescents in the past 5 years alongside a steady increase in daily use of marijuana. This period coincides with a historic rise in depression and suicidal ideation among adolescents. In this study, we describe the associations between e-cigarette and marijuana use and depressive symptoms and suicidality in a large nationally representative sample of high school students. We used data from the 2 most recent waves (2015 and 2017) of the Youth Risk Behavior Survey. Our sample (n = 26,821) included only participants with complete information for age, sex, race/ethnicity, and exposure to e-cigarettes and marijuana (89.5% of survey respondents). We performed multivariate logistic regressions to explore the associations between single or dual use of e-cigarette and marijuana and depressive and suicidal symptoms in the past year adjusting for relevant confounders. E-cigarette-only use was reported in 9.1% of participants, marijuana-only use in 9.7%, and dual e-cigarette/marijuana use in 10.2%. E-cigarette-only use (vs no use) was associated with increased odds of reporting suicidal ideation (adjusted odds ratio [AOR]: 1.23, 95% CI 1.03–1.47) and depressive symptoms (AOR: 1.37, 95% CI 1.19–1.57), which was also observed with marijuana-only use (AOR: 1.25, 95% CI 1.04–1.50 and AOR: 1.49, 95% CI 1.27–1.75) and dual use (AOR: 1.28, 95% CI 1.06–1.54 and AOR: 1.62, 95% CI 1.39–1.88). Youth with single and dual e-cigarette and marijuana use had increased odds of reporting depressive symptoms and suicidality compared to youth who denied use. There is a need for effective prevention and intervention strategies to help mitigate adverse mental health outcomes in this population.

2019 Gobbi et al looked for an association between cannabis use in adolescence and risk of depression, anxiety, and suicidality in young adulthood Abstract: Longitudinal and prospective studies, assessing cannabis use in adolescents younger than 18 years (at least 1 assessment point) and then ascertaining development of depression in young adulthood (age 18 to 32 years) were selected, and odds ratios (OR) adjusted for the presence of baseline depression and/or anxiety and/or suicidality were extracted. Study quality was assessed using the Research Triangle Institute item bank on risk of bias and precision of observational studies. Two reviewers conducted all review stages independently. Selected data were pooled using random-effects meta-analysis. The studies assessing cannabis use and depression at different points from adolescence to young adulthood and reporting the corresponding OR were included. In the studies selected, depression was diagnosed according to the third or fourth editions of Diagnostic and Statistical Manual of Mental Disorders or by using scales with predetermined cutoff points. After screening 3142 articles, 269 articles were selected for full-text review, 35 were selected for further review, and 11 studies comprising 23 317 individuals were included in the quantitative analysis. The OR of developing depression for cannabis users in young adulthood compared with nonusers was 1.37 (95% CI, 1.16-1.62; I2 = 0%). The pooled OR for anxiety was not statistically significant: 1.18 (95% CI, 0.84-1.67; I2 = 42%). The pooled OR for suicidal ideation was 1.50 (95% CI, 1.11-2.03; I2 = 0%), and for suicidal attempt was 3.46 (95% CI, 1.53-7.84, I2 = 61.3%). Although individual-level risk remains moderate to low and results from this study should be confirmed in future adequately powered prospective studies, the high prevalence of adolescents consuming cannabis generates a large number of young people who could develop depression and suicidality attributable to cannabis. This is an important public health problem and concern, which should be properly addressed by health care policy.

2019 (January) Alex Berenson wrote a book: 'Tell your children the truth about marijuana, mental illness and violence'. He writes: My wife Jacqueline is a forensic psychiatrist. She evaluates the criminally mentally ill. She told me that nearly all her patients had used marijuana heavily, many at the times of their crimes. At first I didn't really believe her—stupidly—but she encouraged me to evaluate the evidence myself. And the more I read, the more I realized she was right. Marijuana drives a surprising amount of psychosis, and psychosis—besides being a terrible burden for sufferers and their families—is a shockingly high risk for violent crime. Psychosis is a known factor for violent crime. People with schizophrenia commit violent crime at rates far higher than healthy people - their homicide rates are about 20 times as high. Worse, they commit most of that crime while they are under the influence. Since cannabis causes paranoia—not even advocates dispute that fact—and psychosis, it is not surprising that it would drive violent crime. And in fact there are a number of good studies showing that users have significantly higher violence rates than non-users. Further, in researching the book, I found many, many cases where the causation appeared

clear. In some cases it was as simple and obvious as, *this person—with no history of violence—* smoked, became psychotic, and committed a homicide.

2019 Dellazizzo et al looked at cannabis use and violence in patients with severe mental illness. The relationship between cannabis and violence remains unclear, especially amid those with severe mental illnesses (SMI). The objective of this meta-analysis was to investigate the cannabis-violence association in a population of individuals with a SMI. A systematic search of literature using PubMed, PsychINFO, Web of Science and Google scholar was performed (any time-August 2018). All peer-reviewed publications assessing both cannabis use and the perpetration of violence in an SMI sample were included. Data on several key study characteristics such as the proportion of SMI in the sample as well as the number of cannabis users and violent participants were extracted. Odds ratios (OR) were likewise extracted and aggregated with random-effects models. Of the potential 2449 articles that were screened for eligibility, 12 studies were analyzed using a random-effect meta-analysis. Results showed a moderate association between cannabis use and violence (OR = 3.02, CI = 2.01–4.54,  $p = 0.0001$ ). The association was significantly higher when comparing cannabis misuse (OR = 5.8, CI = 3.27–10.28,  $p = 0.0001$ ) to cannabis use (OR = 2.04, CI = 1.36–3.05,  $p = 0.001$ ). These findings are clinically relevant for violence prevention/management and highlight the necessity of further investigations with methodologically-sound studies. Thus, longitudinal studies adjusting for important confounding factors (i.e., psychopathic traits and stimulant use) are warranted.

2019 Maciel et al looked at physical violence during pregnancy in France. Abstract: Objectives Even during pregnancy women may suffer from violence. We estimated the prevalence of physical abuse during pregnancy, we analyzed the main risk factors and described the relationship between physical violence, psychological wellbeing and pregnancy outcome. Methods We used a national representative sample of births, in all public and private maternity units, in 2016 in France. Women were interviewed after delivery, on their living conditions and occurrence of physical violence at least once during pregnancy. The study of risk factors and pregnancy outcome was done with multivariable logistic regressions. Results Of 12,330 women included in the analysis 1.8% (95% CI 1.6-2.0) had been exposed to physical violence during pregnancy. Risk of violence was associated with the couple situation [women without a partner or in couple not cohabiting (OR 2.89, 95% CI 1.96-4.26)], household income (less than 3000 euros monthly), and state medical assistance coverage. Physical violence was more prevalent in case of a history of induced abortion or cannabis use during pregnancy. Psychological distress was more frequent with than without physical violence (e.g., 62% vs. 24% had a sadness period during pregnancy,  $p < 0.001$ ). The risk of spontaneous preterm birth and transfer of the newborn to a neonatal intensive care unit were significantly higher among women experiencing physical violence during pregnancy compared to other women. Conclusions for Practice Main factors associated with increased risk of violence during pregnancy were socio-economics. The identification by caregivers of women exposed to violence during pregnancy needs to be improved to develop preventive and care strategies.

2019 Cheslack-Postava et al examined increasing depression and substance abuse among former smokers in the United States from 2002 to 2016. Mental health and substance use problems are associated with smoking relapse among former smokers. Yet, little is known about the prevalence of mental health and substance use among former smokers in the U.S. In addition, it is unknown whether the prevalence of these conditions has changed over time as former U.S. smokers have grown to outnumber current U.S. smokers. This study, which was conducted in 2018 and 2019, examined the prevalence and trends over time in depression (2005–2016), marijuana use (2002–2016), and alcohol use problems (2002–2016) among former U.S. smokers. The National Survey on Drug Use and Health is an annual, nationally representative, cross-sectional study. Data from U.S. individuals who were aged  $\geq 18$  years in 2002–2016 were included. Former smokers were defined as having smoked  $\geq 100$  lifetime cigarettes and no past-year cigarettes. From 2005 to 2016, the prevalence of major depression increased from 4.88% to 6.04% (AOR=1.01, 95% CI=1.00, 1.03,  $p=0.04$ ). From 2002 to 2016, past-year marijuana use rose from 5.35% to 10.09% (AOR=1.08, 95% CI=1.07, 1.09,  $p<0.001$ ) among former smokers. Past-month binge alcohol use also increased from 17.22% to 22.33% (AOR=1.03, 95% CI=1.02, 1.04,  $p<0.001$ ), although the prevalence of past-year alcohol abuse or dependence did not change. Depression and substance use, which are factors associated with increased risk for cigarette use relapse, appear to be increasing over time among former U.S. smokers. Increased awareness of these trends may be important for clinical and public health efforts to direct attention to conditions potentially threatening sustained abstinence among former smokers.

2019 Carvalho et al looked at cannabis use and suicide attempts in adolescents from 21 low-middle-income countries. Abstract: **BACKGROUND:** Evidence suggests that cannabis use may be associated with suicidality in adolescence. Nevertheless, very few studies have assessed this association in low- and middle-income countries (LMICs). In this cross-sectional survey, we investigated the association of cannabis use and suicidal attempts in adolescents from 21 LMICs, adjusting for potential confounders. **METHOD:** Data from the Global school-based Student Health Survey was analyzed in 86,254 adolescents from 21 countries [mean (SD) age = 13.7 (0.9) years; 49.0% girls]. Suicide attempts during past year and cannabis during past month and lifetime were assessed. Multivariable logistic regression analyses were conducted. **RESULTS:** The overall prevalence of past 30-day cannabis use was 2.8% and the age-sex adjusted prevalence varied from 0.5% (Laos) to 37.6% (Samoa), while the overall prevalence of lifetime cannabis use was 3.9% (range 0.5%-44.9%). The overall prevalence of suicide attempts during the past year was 10.5%. Following multivariable adjustment to potential confounding variables, past 30-day cannabis use was significantly associated with suicide attempts (OR = 2.03; 95% CI: 1.42-2.91). Lifetime cannabis use was also independently associated with suicide attempts (OR = 2.30; 95% CI: 1.74-3.04). **CONCLUSION:** Our data indicate that cannabis use is associated with a greater likelihood for suicide attempts in adolescents living in LMICs. The causality of this association should be confirmed/refuted in prospective studies to further inform public health policies for suicide prevention in LMICs.

2019 Allan et al investigated the interactive effects of PTSD and substance use on suicidal ideation and behaviour in military personnel and the increased risk from marijuana use. Abstract: The current study examines the unique and interactive effects of posttraumatic stress disorder (PTSD) symptoms and days using alcohol, opioids, and marijuana on PTSD symptoms, suicidal ideation, and suicidal behavior up to 1 year, later in a high-risk sample of military personnel not active in mental health treatment. **Methods** Current and former military personnel at risk for suicide ( $N = 545$ ;  $M$  age = 31.91 years, standard deviation = 7.27; 88.2% male) completed self-report measures of PTSD symptoms, past 30 days heavy alcohol use, opioid use, marijuana use, and current suicidal ideation via telephone at baseline and 1, 3, 6, and 12 months later. PTSD symptoms and the substance use variables (and relevant covariates) were entered as predictors of changes in PTSD symptoms, the likelihood of suicidal ideation, suicidal ideation severity, and the likelihood of suicidal behavior during the 11-month follow-up period. **Results** PTSD symptoms predicted PTSD symptoms 1 month later. PTSD symptoms and marijuana use predicted the likelihood of suicidal ideation 1 month later and suicidal behavior during the 11-month follow-up period. The interaction between PTSD symptoms and marijuana use significantly predicted increased PTSD symptoms over time and suicidal behavior. At high, but not low levels of PTSD symptoms, more days using marijuana predicted increased PTSD symptoms over time and the likelihood of suicidal behavior. **Conclusions:** Results suggest marijuana, especially for military personnel experiencing elevated PTSD symptoms may negatively impact suicidal thoughts and behavior. These results are relevant to suggestions that medical marijuana could be used in treating or augmenting treatment for PTSD.

## References

- Agrawal A, Elliot C Nelson, Kathleen K Bucholz, Rebecca Tillman, Richard A Grucza, Dixie J Statham, Pamela AF Madden, Nicholas G Martin, Andrew C Heath, Michael T ynskey. Major depressive disorder, suicidal thoughts and behaviours, and cannabis involvement in discordant twins: a retrospective cohort study. *The Lancet Psychiatry* [http://dx.doi.org/10.1016/S2215-0366\(17\)30280-8](http://dx.doi.org/10.1016/S2215-0366(17)30280-8)
- Allan NP, Ashrafioun L, Raines AM, Hoge CW, stecker T. Interactive effects of PTSD and substance use on suicidal ideation and behavior in military personnel: Increased risk from marijuana use, Depression and Anxiety <https://doi.org/10.1002/da.22954>
- Andreasson S Allebeck P *Cannabis and mortality among young men: A longitudinal study of Swedish conscripts* Scand. J Soc. Med 1990; 18: 9-15.
- Ansell EB, Laws HB, Roche MJ, Sinha R, Effects of marijuana use on impulsivity and hostility in daily life. *Drug Alcohol Depend.* 2015 Jan 6. pii: S0376-8716(14)02009-2.1016/j.drugalcdep.2014.12.029 [Epub ahead of print]

Arsenault L Cannon M Poulton R Murray R Caspi A Moffitt TE *Cannabis use in adolescence and risk for adult psychosis: Longitudinal prospective study* British Medical Journal 2002; 325: 1212-3.

Ashton CH *Adverse effects of cannabis and cannabinoids* British Journal of Anaesthesia 1999; 83: 637-49.

Bahorik AL, Leibowitz A, Sterling SA, Travis A, Weisner C, Satre DD. Patterns of marijuana use among psychiatry patients with depression and its impact on recovery.

*J Affect Disord.* 2017 Apr 15;213:168-171. doi: 10.1016/j.jad.2017.02.016. Epub 2017 Feb 14.

Beautrais AL Joyce PR Mulder RT *Cannabis abuse and serious suicide attempts* Addiction 1999; 94(8): 1155-64.

Berenson A, Tell your children the truth about marijuana, mental illness and violence. Free Press, An imprint of Simon & Schuster, Inc. 1230 Avenue of the Americas, New York, NY 10020 January 2019.

Borges G, Benjet C, Orozco R, Medina-Mora ME, Menendez D. Alcohol, cannabis and other drugs and subsequent suicide ideation and attempt among young Mexicans. *J Psychiatr Res.* 2017 Aug;91:74-82. doi: 10.1016/j.jpsychires.2017.02.025. Epub 2017 Mar 1.

Bovasso GB *Cannabis abuse as a risk factor for depressive symptoms* Am J Psychiatry 2001;158: 2033-7.

Brook DW et al *Drug use and the risk of major depressive disorder, alcohol dependence, and substance use disorders* Archives of General Psychiatry 2002; 59: 1039-44.

Brook JS et al *The effect of early marijuana use on later anxiety and depressive symptoms* NYS Psychologist 2001; 35-39.

Brook JS, Lee JY, Finch SJ, Brook DW, *Developmental trajectories of marijuana use from adolescence to adulthood: Relationship with using weapons including guns.* Aggress Behav 2913 Dec 16<sup>th</sup> doi: 10.1002/ab.21520 (Epub ahead of print).

Cairns KE, Yap MB, Pilkington PD, Jorm AF, Risk and protective factors for depression that adolescents can modify: A systematic review and meta-analysis of longitudinal studies. *J Affect Disord.* 2014 August 12:169C:61-75.

Carvalho AF, Stubbs B Vancampfort D, Kloiber S, Maes M, Firth J6 Kurdyak PA, Stein DJ, Rehm J, Koyanagi A Cannabis use and suicide attempts among 86,254 adolescents aged 12-15 years from 21 low- and middle-income countries. *Eur Psychiatry.* 2019 Feb;56:8-13. doi: 10.1016/j.eurpsy.2018.10.006. Epub 2018 Nov 15.

Chadi N, Guilin L, Cerda, N, Weitzman, ER *Depressive Symptoms and Suicidality in Adolescents Using e-Cigarettes and Marijuana* Journal of Addiction Medicine: January 24, 2019 - Volume Publish Ahead of Print - Issue - p doi: 10.1097/ADM.0000000000000506

Chen C Wagner FA Anthony JC *Marijuana use and the risk of major depressive episode. Epidemiological Evidence from the United States National Co-morbidity Survey* Social Psychiatry and Psychiatric Epidemiology 2002; 37: 199-206.

Cheslack-Postava K, Wall M, Weinberger AH, Goodwin R. Increasing Depression and Substance Use Among Former Smokers in the United States, 2002–2016 *American Journal of Preventive Medicine* DOI: <https://doi.org/10.1016/j.amepre.2019.05.014>

Coentre R, Talina MC, Góis C, Figueira ML. Depressive symptoms and suicidal behaviour after first-episode psychosis: A comprehensive systematic review. *Psychiatry Res.* 2017 Apr 5;253:240-248. doi: 10.1016/j.psychres.2017.04.010. [Epub ahead of print]

Dawson NL, Lachner C, Vadeboncoeur TF, Maniaci MJ, Bosworth V, Rummans TA, Roy A, Burton MC. Violent behavior by emergency department patients with an involuntary hold status. *Am J Emerg Med.* 2018 Mar;36(3):392-395. doi: 10.1016/j.ajem.2017.08.039. Epub 2017 Aug 18.

De Graff R, Radovanovic M, van Laar M, Fairman B, Degenhardt L, Aguilar-Gaxiola S, Bruffaerts R, de Girolamo G, Fayyad J, Gureje O et al, *Early Cannabis Use and Estimated Risk of later Onset of Depression Spells: Epidemiological Evidence From The Population-Based WHO World Mental health Survey Initiative.* 2010 American Journal of Epidemiology vol 172 No 2 June 9th.

Degenhardt L Hall W Lynskey M *The relationship between cannabis use, depression and anxiety among Australian adults: Findings from the National survey of Mental Health and Well-being* Social Psychiatry and Psychiatric Epidemiology 2001; 36: 219-227.

Degenhardt L Hall W Lynskey M *Testing hypotheses about the relationship between cannabis use and psychosis* Drug and Alcohol Dependence 2003; 71(1) 37-48.

Dellazizzo L, Potvin S, Beaudoin M, Luigi M, Dou Bo Yi, Gigeure C-E, Dumais A. Cannabis use and violence in patients with severe mental illnesses: A meta-analytical investigation. *Psychiatry Research* Vol. 274 April 2019 Pages 42-48. <https://doi.org/10.1016/j.psychres.2019.02.010>

Dierker L, Selya A, Lanza S, Li R, Rose J. Depression and marijuana use disorder symptoms among current marijuana users. *Addict Behav.* 2017 Aug 18;76:161-168. doi: 10.1016/j.addbeh.2017.08.013. [Epub ahead of print]

Dornbusch SM Lin I-C Munroe PT Bianchi AJ *Adolescent poly drug use and violence in the United States* Int J Adolesc Med Health 1999; 11: 197-219.

Dugré JR, Dellazizzo L, Giguère C-É, Potvin S and Dumais A (2017) Persistency of Cannabis Use Predicts Violence following Acute Psychiatric Discharge. *Front. Psychiatry* 8:176. doi: 10.3389/fpsy.2017.00176

Dyer C *Violence may be predicted among psychiatric patients* BMJ 1996; 313:318.

Fazel S, Lichtenstein P, Grann M, Goodwin GM, Langstrom N, *Bipolar Disorder and Violent Crime* Arch. Gen. Psychiatry 2010, 67(9):931-938.

Fergusson DM Horwood LJ *Early onset cannabis use and psychosocial adjustment in young adults* Addiction 1997; 92: 279-296.

Fergusson DM Horwood LJ Swain-Campbell N *Cannabis use and psychosocial adjustment in adolescence and young adulthood* Addiction 2002; 97: 1123-35.

Fergusson D, Horwood LJ, Van Ours JC, Williams J, Cannabis Use and Suicidal Ideation. CEPR Discussion paper No. DP1904 available at SSRN:<http://ssrn.com/abstract=2153485> Aug. 2012

Friedman AS Kramer S Kreisher C Granick S The relationships of substance abuse to illegal and violent behaviour, in a community sample of young adult African American men and women (gender differences) *J Subst Abuse* 1996; 8: 379-402.

Friedman AS, Glassmans K, Terras BA, Violent behaviour as related to use of marijuana and other drugs. *J. Addict. Dis.*2001; 20(1):49-72.

Friedman AS, Terras A, Glassman K, The differential disinhibition effect of marijuana use on violent behaviour: a comparison of this effect on a conventional, non-delinquent group versus a delinquent or deviant group. *J Addict Dis.* 2003; 22(3): 63-78.

Fugelstad A Gerhardsson de Verdier M Rajs J *Cannabis-related deaths*  
Stockholm Cannabis Conference; 1995.

Gates ML, Turney A, Ferguson E, Walker V, Staples-Horne M. Associations among Substance abuse, Mental Health Disorders and Self-Harm in a Prison Population: Examining Group Risk for Suicide Attempt. *Int J Environ Res Public Health.* 2017 Mar 20;14(3). pii: E317. doi: 10.3390/ijerph14030317.

Gobbi G et al, *Cannabis damages young brains more than originally thought* Dec. 5, 2009, *Neurobiology of Disease*, online id=634359

Gobbi G, Atkin T, Zytynski T, Wang S, Askari S, Boruff J, Ware M, Marmorstein N, Cipriani A, Dendukuri N, Mayo N. Association of Cannabis Use in Adolescence and Risk of Depression, Anxiety, and Suicidality in Young Adulthood: A Systematic Review and Meta-analysis. *JAMA Psychiatry.* 2019 Feb 13. doi: 10.1001/jamapsychiatry.2018.4500

Grant BF *Comorbidity between DSM-IV drug use disorders and major depression: results of a national survey of adults* *J of Substance Abuse* 1995; 7: 481-97.

Green B, Ritter C, *Marijuana use and depression* .  
*Journal of Health and Social Behaviour* 2000: vol 41(1); 40-49

Guimarães RA, Mesquita NS, Lopes RS, Lucchese R, Felipe RL,, Vera I, Fernandes IL, Castro PA, Monteiro LHB, Silva GC. Prevalence and Factors Associated With Criminal Behavior Among Illicit Drug Users: A Cross-Sectional Study. *Subst Use Misuse.* 2017 Apr 21:1-7. doi: 10.1080/10826084.2017.1284231. [Epub ahead of print]

Guvendeger Doksat N, Zahmacioglu O, Ciftci Demirci A, Kocaman GM, Erdogan A. Association of Suicide Attempts and Non-Suicidal Self-Injury Behaviors With Substance Use and Family Characteristics Among Children and Adolescents Seeking Treatment for Substance Use Disorder. *Subst Use Misuse.* 2017 Apr 16;52(5):604-613. doi: 10.1080/10826084.2016.1245745. Epub 2017 Jan 31.

Hall JA Pacula RL *Cannabis use and dependency:*  
*Public Health and Public Policy* Cambridge University Press 2003.

Hallfors DD, Waller MW, Bauer D, Ford CA, Halpern CT “Which Comes First in Adolescence – Sex and Drugs or Depression?” *Am J Prev Med* 2005; 29(3).163-170.

Howard RC, Menkes DB, Changes in brain function during acute cannabis intoxication: preliminary findings suggest a mechanism for cannabis-induced violence.  
*Criminal Behavior and Mental Health* 17:113-7 2007.

Johnson RM, LaValley M, Schneider KE, Musci RJ, Pettoruto K, Rothman EF. Marijuana use and physical dating violence among adolescents and emerging adults: A systematic review and meta-analysis. *Drug Alcohol Depend.* 2017 May 1;174:47-57. doi: 10.1016/j.drugalcdep.2017.01.012. Epub 2017 Feb 28. Review.

Kandel DB *Marijuana users in young adulthood*  
*Archives of General Psychiatry* 1984; 41(2): 200-209.

Kandel DB Chen K *Types of marijuana users by longitudinal course (comment)* *J of Studies on Alcohol* 2000; 61(3): 367-78.

Kelder SH Murray NG Orpinas P Prokhorov A McReynolds L Zhang Q Roberts R Depression and substance use in minority middle-school students *American Journal of Public Health* 2000; 91:761-6.

Kimbrel NA, Newins AR, Dedert EA, Van Voorhees EE, Elbogen EB, Naylor JC, Ryan Wagner H, Brancu M; VA Mid-Atlantic MIRECC Workgroup, Beckham JC, Calhoun PS. Cannabis use disorder and suicide attempts in Iraq/Afghanistan-era veterans. *J Psychiatr Res*. 2017 Jan 5;89:1-5. doi: 10.1016/j.jpsychires.2017.01.002. [Epub ahead of print]

Kouri EM Pope HG Lukas SE Changes in aggressive behaviour during withdrawal from long-term marijuana use  
*Psychopharmacology* 1999; 143: 302-08.

Kouri EM Pope HG Lukas SE Changes in aggressive behaviour during withdrawal from long-term marijuana use  
*Psychopharmacology* 1999; 143: 302-08.

Kylie Lee KS, Sukavatvibul K, Conigrave KM. Kylie Lee KS, Sukavatvibul K, Conigrave KM. Cannabis use and violence in three remote Aboriginal Australian communities: Analysis of clinic presentations. *Transcult Psychiatry*. 2015 Dec;52(6):827-39. doi: 10.1177/1363461515589047. Epub 2015 Jun 4.

Lee KS Kylie, Clough AR, Jaragba MJ, Conigrave KM, Patton G. Heavy cannabis use and depressive symptoms in three Aboriginal communities in Arnhem Land, Northern Territory.  
*MJA* 2008;188(10):605-8.

Lynskey M et al Major depressive disorder, suicidal ideation, and suicide attempt in twins discordant for cannabis dependence and early-onset cannabis use *Archives of General Psychiatry* 2004; 61:1026-32.

Maciel MNA, Blondel B, Saurel-Cubizolles MJ. Physical Violence During Pregnancy in France: Frequency and Impact on the Health of Expectant Mothers and New-Borns.  
*Matern Child Health J*. 2019 Jun 15. doi: 10.1007/s10995-019-02747-y. [Epub ahead of print]

Maharajh HD Konings M Cannabis and suicidal behaviour among adolescents: a pilot study from Trinidad *Scientific World Journal* Aug 8<sup>th</sup> 2005; 5: 576-85.

Miles DR Van den Bree MBM Pickens RW  
Sex differences in shared genetic and environmental influences between conduct disorder symptoms and marijuana use in adolescents  
*American Journal of Medical genetics, Part B: Neuropsychiatric Genetics* 2002; 114(2): 159-68.

Miller P McC Plant M Drinking smoking and illicit drug use among 15 and 16 year-olds in the United Kingdom *BMJ* 1996; 313: 394-7.

Miller NS, Oberbarnscheidt T 2017, Marijuana Violence and the Law. (2017) *J Addict Res Ther* S11:014. doi:10.4172/2155-6105.1000S11-014

Moitra E, Anderson BJ, Stein MD. Reductions in cannabis use are associated with mood improvement in female emerging adults. *Depress Anxiety*. 2015 Dec 4. doi: 10.1002/da.22460. [Epub ahead of print]

Mok PLH, Pedersen CB, Springate D. Parental Psychiatric Disease and Risks of Attempted Suicide and Violent Criminal Offending in Offspring *JAMA Psychiatry* 2016;73(10):1015-1022. doi:10.1001/jamapsychiatry.2016.1728.

Monshouwer K Van Dorsselaer S Verdurmen J et al Cannabis use and mental health in secondary school children: Findings from a Dutch survey  
*British Journal of Psychiatry* 2006; 188: 148-53

Niveau G Dang C Cannabis and violent crime  
Med Sci Law 2003; 43(2): 115-21.

Orpinas P, Nahapetyan L, Truszczynski N. Low and Increasing Trajectories of Perpetration of Physical Dating Violence: 7-Year Associations with Suicidal Ideation, Weapons, and Substance Use. *J Youth Adolesc.* 2017 May;46(5):970-981. doi: 10.1007/s10964-017-0630-7. Epub 2017 Jan 16.

Otten R, Rutger CME, Engels, Testing bi-directional effects between cannabis use and depressive symptoms: moderation by the serotonin transporter gene.. *Addiction Biology*, 2011, DOI: 10.1111/j.1369-1600.2011.00380.x

Pardini D, Bechtold J, Loeber R, White helene Developmental Trajectories of Marijuana Use among men *Journal of Research in Crime and delinquency* June 29<sup>th</sup> 2015 doi: 10.1177/0022427815589816.

Patton GC Coffey C Carlin JB Degenhardt L Lynskey L Hall W Cannabis use and mental health in young people: Cohort study  
*British Medical Journal* 2002; 325: 1195-8.

Pederson W Mastekaasa A Wichstrom L Conduct problems and early cannabis initiation: a longitudinal study of gender differences  
*Addiction* 2001; 96(3): 415-31.

Pro G, Sanker E, Marzell M, Microaggressions and marijuana use among college students. *J Ethn Subst Abuse.* 2018 Jul-Sep;17(3):375-387. doi: 10.1080/15332640.2017.1288191. Epub 2017 Mar 9.

Reingle JM, Staras SA, Jennings WG, Branchini J, Maldonado-Molina MM. The Relationship Between marijuana Use and Intimate Partner Violence in a Nationally Representative Longitudinal Sample. *J Interpers Violence.* 2012 May;27(8):1562-78. doi: 10.1177/0886260511425787. Epub 2011 Nov 11.

Resnick MD Bearman PS Blum RW et al Protecting Adolescents from harm: findings from the National Longitudinal Study on Adolescent Health  
*JAMA* 1997; 278: 823-32.

Rey JM Sawyer MG Raphael B Patton GC Lynskey M Mental health of teenagers who use cannabis  
*Journal of Psychiatry* 2002; 180:216-221.

Rey J et al Is the party over? Cannabis and juvenile psychiatric disorder: The past 10 years  
*J of The Academy of Child and Adolescent Psychiatry* 2004; 43: 1194-1205.

Rhew IC, et al, Early adolescent depression increases risk for cannabis, alcohol abuse. *Addiction* 2017;doi: 10.1111/add.13907.

Rodway C, Tham S-G, Ibrahim S, Turnbull P, Windfuhr K, Shaw J, Kapur N, Appleby L, Suicide in Children and Young people in England: a consecutive case study: *The Lancet Psychiatry* May 2016  
DOI: [http://dx.doi.org/10.1016/S2215-0366\(16\)30094-3](http://dx.doi.org/10.1016/S2215-0366(16)30094-3)

Rowe MG Fleming MF Barry KL Manwell LB Kropp S Correlates of depression in primary care *J of Family Practice* 1995; 41(6): 551-8.

2014 SAMHSA National survey of drug abuse and health. *Psychiatric News* (18) January 2014

Shalit N, Shoval G, Schlosberg D, Feingold D, Lev-Ran S. The association between cannabis use and suicidality among men and women: A population-based longitudinal study.  
*J. Affect. Disord.* 2016, Nov 15<sup>th</sup> 15;205:216-224. DOI: 10.1016/j.jad.2016.07.010. Epub. Jul. 5<sup>th</sup>.

Sheehan CM, Rogers RG, Williams IV GW, Boardman JD, Gender differences in the presence of drugs in violent deaths. *Addiction* 108 issue 3 pages 547-555 March 2012. doi: 10.1111/j.1360-0443.2012.04098.x

- Schoeler T, Theobald D, Pingault JB, Farrington DP, Jennings WG, Piquero AR, Coid JW, Bhattacharyya S. Continuity of cannabis use and violent offending over the life course. *Psychol Med.* 2016 Mar 10:1-15. [Epub ahead of print]
- Smith PH, Homish GG, Leonard KE, Collins RL, Marijuana withdrawal and aggression among a representative sample of US marijuana users. *Drug Alcohol Dependence* 2013 Feb pii: S0376-8716(13)00004-5 doi: 10.1016/j.drugalcdep.2013.01.002. (epub ahead of print)
- Spunt B Goldstein P Brownstein H Fendrich M The role of marijuana in homicide *Int J Addict* 1994; 29(2): 195-213.
- Subramaniam P, Rogowska J, DiMuzio J, Lopez-Larson M, McGlade E, Yurgelun-Todd D. Orbitofrontal connectivity is associated with depression and anxiety in marijuana-using adolescents. *J Affect Disord.* 2018 Jul 3;239:234-241. doi: 10.1016/j.jad.2018.07.002. [Epub ahead of print]
- Thomas H Psychiatric Symptoms in cannabis users  
*Br J of Psychiatry* 1993; 163: 141-9.
- Troisi A Pasini A Saracco M Spalletta G Psychiatric symptoms in male cannabis users on using other drugs *Addiction* 1998; 93: 487-492.
- Vlahov D et al, Increased use of cigarettes, Alcohol and Marijuana among Manhattan, New York residents after September 11<sup>th</sup> Terrorist Attacks. *American Journal of Epidemiology* 155(11): 988-996 June 1<sup>st</sup> 2002.
- Weller RA Aberger E Goldberg SL Marijuana use and abuse in psychiatric outpatients *Annals of Clinical Psychiatry* 1989; 1: 87-91.
- Wilkinson ST, Stefanovics E, Rosenbeck RA, Marijuana use is associated with worse outcomes in symptom severity and violent behaviour in patients with post traumatic stress disorder. *J. Clin. Psychiatry* 2015 Sept, 76(9): 1174-80. doi: 10.4088/JCP.14m09475.
- Winokur G Turvey C et al Alcoholism and drug abuse in three groups – bipolar 1, unipolars and their acquaintances  
*Journal of Affective Disorders* 1998; 50: 81-89.
- White HR Hansell S Acute and long-term effects of drug use on aggression from adolescence into adulthood *J Drug Issues* 1998; 28: 837-58.
- Wong SS, Zhou B, Goebert D, Hishinuma ES, The risk of adolescent suicide across patterns of substance use: a nationally representative study of high school students in the United States from 1999 to 2009.  
*Soc. Psychiatry Psychiat Epidemiol* 2013 June. Epub ahead of print doi:10.1007/s00127-013-0721-z
- Wright NE, Scerpella D, Lisdahl KM. Marijuana Use is Associated with Behavioural Approach and Depressive Symptoms in Adolescents and Emerging Adults. *PLoS One* 2016 Nov 11;11(11):e0166005. doi: 10.1371/journal.pone.0166005.
- Zang X, Wu LT. Suicidal ideation and substance use among adolescents and young adults: A bidirectional relation? *Drug Alcohol Depend.* 2014 June 12<sup>th</sup> pii: S0376-8716 (14)00908-9. doi: 10.1016/j.drugalcdep.2014.05.205.





