The Latest Information on Cannabis for the Prevention Professional

Jason R. Kilmer, Ph.D.
University of Washington
Associate Professor
Psychiatry & Behavioral Sciences
Adjunct Associate Professor
Psychology

@cshrb_uw

Overview of this presentation

• Special thank you to:
  ▫ Aisha Hamid, Conor Burke, Agnes Skowron, and Scott Gagnon
  ▫ All of you for making the time for today’s presentation

• What I said I would cover:
  ▫ How does cannabis today differ from potency in the 1970s, 1980s, 1990s, and 2000s? How does cannabis affect sleep? What are the effects of cannabis use on attention and memory? Hear the answers to these questions and more, with an emphasis on opportunities for prevention.
    • Learning objectives:
      • (1) Participants will be able to identify a screening measure for Cannabis Use Disorder
      • (2) Participants will be able to describe at least 2 risks/outcomes associated with cannabis use
      • (3) Participants will be able to identify at least one prevention or public health approach/opportunity for use in their community
CANNABIS USE – onset

- **Many routes/means of use:**
  - Smoked (joints, bongs, pipes)
  - Vaped (vaporizer)
  - Ingested orally (brewed as a tea, food, edibles)
  - Concentrates (dabbing, hash oil, budder, shatter)
- **When smoked/vaped...**
  - Effects begin immediately
- **When consumed in food or drink...**
  - Effects begin 30-60 minutes


---

**Norms**

*(and highest misperceptions among those who report use)*

Past year cannabis use by age group

Source: SAMHSA 2020 National Survey on Drug Use and Health

Percentage with past year cannabis use
- 12 to 17 year olds
- 18 to 25 year olds
- 26 years and older

A lot of times we hear “it’s safe” or “it’s safer than alcohol”

The “who’s who” of cannabis researchers globally have weighed in on risks of cannabis use
General Precaution A:

“There is no universally safe level of cannabis use; thus, the only reliable way to avoid any risk for harm from using cannabis is to abstain from its use.”

Potency/concentration is at never before seen levels, so statements like “it’s just weed,” or “it’s natural,” or “I used when I was younger and I turned out fine” need to be addressed.
Neuroscientific model of motivational process

Sang-il Kim*
Department of Education, Brain and Mind Research Institute, Korea University, Seoul, South Korea

Considering the neuroscientific findings on reward, learning, value, decision-making, and cognitive control, motivation can be generated through three sub-processes: a process of generating motivation, a process of maintaining motivation, and a process of regulating motivation. I propose a theoretical neuroscientific model of motivational processes which consist of three distinct but continuous sub-processes: reward-driven processes, value-based decision-making, and goal-directed control. Reward-driven approach is the process in which motivation is generated by reward anticipation, and selective approach is the process toward reward. This process results in the ventral striatum (reward area) in which basic stimulation-attention mechanism is formed, and is described as an automatic motivation to which relatively little attention is assigned. By contrast, value-based decision-making is the process of evaluating various outcomes of actions, learning through previous prediction errors, and calculating the value continuously. The orbitofrontal cortex and ventral striatum play crucial roles in sustaining motivation. Lastly, the goal-directed control is the process of regulating motivation through cognitive control to achieve goals. This consciously controlled motivation is associated with higher-level cognitive functions such as planning, rehearsing the goal, monitoring the performance, and regulating action. The anterior cingulate cortex (attention area) and the dorsolateral prefrontal cortex (cognitive control area) are the main neural circuits related to regulation of motivation. These three sub-processes interact with each other to produce reward motivation, maintain motivation through activation mechanisms, and regulate motivation through cognitive control mechanisms.
What do researchers and scientists consider “high potency” cannabis?

Anything over 10% THC

**Archival Report**


Mahmoud A. ElSohly, Zlatko Mehmedic, Susan Foster, Chandrani Gon, Suman Chandra, and James C. Church

**ABSTRACT**

Background: Marijuana is the most widely used illicit drug in the United States and all over the world. Reports indicate that the potency of cannabis preparation has been increasing. This report examines the concentration of cannabinoids in illicit cannabis products seized by the U.S. Drug Enforcement Administration over the last 2 decades, with particular emphasis on Δ9-tetrahydrocannabinol and cannabidiol.

Methods: Samples in this report were received over time from materials confiscated by the Drug Enforcement Administration and processed for analysis using a validated gas chromatography with flame ionization detector method.

Results: Between January 1, 1995, and December 31, 2014, 38,881 samples of cannabis preparations were received and analyzed. The data showed that although the number of marijuana samples seized over the last 4 years has declined, the number of sensimilla samples has increased. Overall, the potency of illicit cannabis plant material has consistently increased over time since 1995: from ~4% in 1995 to ~12% in 2014. The cannabinoid content has decreased on average from ~28% in 2001 to ~19% in 2011, resulting in a change in the ratio of Δ9-tetrahydro-...

Variation in cannabis potency and prices in a newly legal market: evidence from 30 million cannabis sales in Washington state

Rosanna Smart¹, Jonathan P. Caulkins¹², Beau Kilmer³, Steven Davenport¹ & Greg Midgette¹

RAND Corporation, Santa Monica, CA, USA¹ and Heinz College, Carnegie Mellon University, Pittsburgh, PA, USA²

**ABSTRACT**

**Aims** To (1) assess trends and variation in the market share of product types and potency sold in a legal cannabis retail market and (2) estimate how potency and purchase quantity influence price variation for cannabis flower. 

**Design** Secondary analysis of publicly available data from Washington State’s cannabis traceability system spanning 7 July 2014 to 30 September 2016. Descriptive statistics and linear regressions assessed variation and trends in cannabis
Figure 3  Market shares for cannabis flower products sold by delta-9-tetrahydrocannabinol (THC) % category. Market share is calculated as a percent of total cannabis flower expenditures (excise-tax-inclusive). [Colour figure can be viewed at wileyonlinelibrary.com]


95.91% of Colorado market is “high potency” cannabis


95.90% of California market is “high potency” cannabis


97.07% of Washington market is “high potency” cannabis

Why potency matters

Increased risk of addiction and generalized anxiety disorder


For concentrates/extracts, more association with “problematic cannabis use, cannabis use disorder, and mental health disorders.” -- Gabrys (2020)

Report Findings

- **Young people are particularly vulnerable.** There is strong evidence of the detrimental impact of THC use during adolescence, and negative impacts may be exacerbated for those who use high potency cannabis or use more frequently.

- **The risk of developing cannabis use disorder or addiction,** particularly among adolescents, is higher with use of high potency cannabis products.

High-Potency Cannabis

With a legal market of cannabis products has come the wide distribution of manufactured products containing much higher levels of THC than what has been historically found in the plant.

https://adai.uw.edu/cerp/high-potency-cannabis/

*If student success is important and a priority, then investment in prevention also has to be important and a priority.*

*Help principals, administrators, teachers, and parents understand why prevention matters.*
America's Dropout Crisis:
The Unrecognized Connection
To Adolescent Substance Use

"There is no problem so bad that alcohol and drugs will not make it worse."

Robert L. Dufren, M.D.1
Kimberly M. Cubans, M.S.1
Helen S. Dufren, M.S.A.1
Kathryn R. Vincent, M.A.1
Gretchen L. Sheu, M.A.1
Andrea M. Aron, Ph.D.1

March 2013

1Institute for Behavior and Health, Inc. (IBH), 6515 Executive Boulevard, Rockville, MD, 20852.
2Center on Young Adult Health and Development (CYAHD), University of Maryland School of Public
Health, 1 Liacouras Public Health Building, College Park, MD 20742.

http://www.cls.umd.edu/docs/AmerDropoutCrisis.pdf

"Of all the problems that contribute to dropping out, substance use is one of the
easiest to identify and one of the most easily stopped by interventions including
treatment."

"Research evidence shows that when adolescents stop substance abuse, academic
performance improves."

Students who use substances are at increased risk for academic failure,
including drop out

Cannabis has stronger negative relationship to GPA and other
outcomes and risk for dropout than alcohol use

“The more severe the substance use, the more likely the impact on
academic performance and risk for dropout.”

http://www.cls.umd.edu/docs/AmerDropoutCrisis.pdf
Relationship Between Cannabis Use and Academic Success

- More frequent cannabis use associated with lower GPA, skipping more classes, less current enrollment, and being less likely to graduate on time (Arria, et al., 2013, 2015; Suerken, et al., 2016)


Marijuana and cognitive abilities

- **Effects on the brain**
  - **Hippocampus**
    - Attention, concentration, and memory
  - Research with college students shows impact on these even 24 hours after last use (Pope & Yurgelun-Todd, 1996)
  - After daily use, takes 28 days for impact on attention, concentration, and memory to go away (Pope, et al., 2001)
  - **Hanson et al. (2010):**
    - Deficits in verbal learning (takes 2 weeks before no differences with comparison group)
    - Deficits in verbal working memory (takes 3 weeks before no difference with comparison group)
    - Deficits in attention (still present at 3 weeks)
There are other ways in which cannabis use could contribute to academic outcomes – we can help people connect dots they might not be connecting

Student-identified barriers to academic success

n =23,600 undergraduate students from 41 colleges/universities in Fall 2021

- Of 51 possibilities, the top five student-identified factors affecting academic performance:
  - 52.3% Procrastination
  - 42.3% Stress
  - 33.7% Anxiety
  - 24.6% Depression
  - 24.3% Sleep difficulties

- 1.7% Cannabis use (tied for 36th of 51 factors with urinary tract infection and concussion/TBI)

American College Health Association, 2022
With cannabis, two things happen...
Extension of Stage 4 or "deep" sleep and REM deprivation


Next day, increase in:
- Daytime sleepiness
- Anxiety
- Irritability
- Jumpiness

Angarita, et al., 2016
Next day, increase in:
• Daytime sleepiness
• Anxiety
• Irritability
• Jumpsiness

Angarita, et al., 2016

Next day, feel:
• Fatigue
Cannabis is, without question, an addictive substance. Statements like “you can’t get addicted to weed” need to be addressed. For so many reasons, including validating those struggling with making a change.

MaCoun (2013), Frontiers in Psychiatry

<table>
<thead>
<tr>
<th>Criterion</th>
<th>DSM-IV substance dependence</th>
<th>DSM-5 substance use disorder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tolerance</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Taken more/longer than intended</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Desire/unsuccessful efforts to quit use</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Great deal of time taken by activities</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Involved in use</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Use despite knowledge of problems associated with use</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Important activities given up because of use</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Recurrent use resulting in a failure to fulfill important role obligations</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Recurrent use resulting in physically hazardous behavior (e.g., driving)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Continued use despite recurrent social problems associated with use</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Craving for the substance</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

DSM-5 Cannabis Use Disorder Criteria

Mild: 2-3 symptoms
Moderate: 4-5 symptoms
Severe: 6+ symptoms
Separating reported medical use from management of withdrawal

### Motivations for Use

<table>
<thead>
<tr>
<th>Motive Category</th>
<th>Proportion of participants endorsing motive</th>
<th>Proportion of primary motives</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Enjoyment/fun</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enjoyment/fun (e.g., be happy, get high, enjoy feeling)</td>
<td>82.14%</td>
<td>24.03%</td>
</tr>
<tr>
<td>Conformity (e.g., peer pressure, friends do it)</td>
<td>42.81%</td>
<td>16.40%</td>
</tr>
<tr>
<td>Experimentation (e.g., new experience, curiosity)</td>
<td>41.25%</td>
<td>22.36%</td>
</tr>
<tr>
<td><strong>Social enhancement</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social enhancement (e.g., bonding with friends, hang out)</td>
<td>25.71%</td>
<td>8.66%</td>
</tr>
<tr>
<td><strong>Boredom</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boredom (e.g., something to do, nothing better to do)</td>
<td>25.06%</td>
<td>4.15%</td>
</tr>
<tr>
<td>Relaxation (e.g., to relax, helps me sleep)</td>
<td>24.64%</td>
<td>6.97%</td>
</tr>
<tr>
<td>Coping (e.g., depressed, relieve stress)</td>
<td>18.14%</td>
<td>5.10%</td>
</tr>
<tr>
<td>Availability (e.g., easy to get, it was offered)</td>
<td>13.74%</td>
<td>2.23%</td>
</tr>
<tr>
<td>Relative low risk (e.g., low health risk, no hangover)</td>
<td>10.66%</td>
<td>0.96%</td>
</tr>
<tr>
<td><strong>Altered perception</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Altered perception or perspectives (e.g., to enhance experiences, walked binge very far)</td>
<td>10.58%</td>
<td>1.81%</td>
</tr>
<tr>
<td><strong>Activity enhancement</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activity enhancement (e.g., music sounds better, every day activities more interesting)</td>
<td>5.68%</td>
<td>0.80%</td>
</tr>
<tr>
<td>Rebellion (e.g., rebelling against parents, thrill of something illegal)</td>
<td>8.21%</td>
<td>0.32%</td>
</tr>
<tr>
<td>Alcohol intoxication (e.g., I was drunk)</td>
<td>4.42%</td>
<td>0.47%</td>
</tr>
<tr>
<td>Food enhancement (e.g., enjoy good food, food tastes better)</td>
<td>3.78%</td>
<td>0.00%</td>
</tr>
<tr>
<td>Anxiety reduction (e.g., be less shy, feel less insecure)</td>
<td>3.31%</td>
<td>0.00%</td>
</tr>
<tr>
<td><strong>Image enhancement</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Image enhancement (e.g., to be cool, to feel cool)</td>
<td>2.85%</td>
<td>0.32%</td>
</tr>
<tr>
<td><strong>Celebration</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Celebration (e.g., special occasion, to celebrate)</td>
<td>1.26%</td>
<td>0.16%</td>
</tr>
<tr>
<td>Medical use (e.g., alleviate physical pain, have a headache)</td>
<td>1.26%</td>
<td>0.16%</td>
</tr>
<tr>
<td>Habit (e.g., feeling was addictive, became a habit)</td>
<td>0.95%</td>
<td>0.00%</td>
</tr>
</tbody>
</table>

Lee, Neighbors & Woods (2007)
## Motivations for Use

<table>
<thead>
<tr>
<th>Motive Category</th>
<th>Proportion of participants endorsing motive</th>
<th>Proportion of primary motives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enjoyment/fun (e.g., be happy, get high, enjoy feeling)</td>
<td>52.14%</td>
<td>24.03%</td>
</tr>
<tr>
<td>Conformity (e.g., peer pressure, friends do it)</td>
<td>42.81%</td>
<td>16.40%</td>
</tr>
<tr>
<td>Experimentation (e.g., new experience, curiosity)</td>
<td>41.25%</td>
<td>29.36%</td>
</tr>
<tr>
<td>Social enhancement (e.g., bonding with friends, hang out)</td>
<td>25.71%</td>
<td>8.66%</td>
</tr>
<tr>
<td>Boredom (e.g., something to do, nothing better to do)</td>
<td>25.00%</td>
<td>4.16%</td>
</tr>
<tr>
<td>Relaxation (e.g., to relax, helps me sleep)</td>
<td>24.64%</td>
<td>6.97%</td>
</tr>
<tr>
<td>Coping (e.g., depressed, relieve stress)</td>
<td>18.14%</td>
<td>5.10%</td>
</tr>
<tr>
<td>Availability (e.g., easy to get, it was offered)</td>
<td>13.74%</td>
<td>2.23%</td>
</tr>
<tr>
<td>Relative low risk (e.g., low health risk, no hangover)</td>
<td>10.66%</td>
<td>0.96%</td>
</tr>
<tr>
<td>Altered perception or perspectives (e.g., to enhance experiences, makes things more fun)</td>
<td>10.56%</td>
<td>1.81%</td>
</tr>
<tr>
<td>Activity enhancement (e.g., music sounds better, every day activities more interesting)</td>
<td>5.68%</td>
<td>0.80%</td>
</tr>
<tr>
<td>Rebellion (e.g., rebelling against parents, thrill of something illegal)</td>
<td>5.21%</td>
<td>0.32%</td>
</tr>
<tr>
<td>Alcohol intoxication (e.g., I was drunk)</td>
<td>4.42%</td>
<td>0.47%</td>
</tr>
<tr>
<td>Food enhancement (e.g., enjoy good food, food taste better)</td>
<td>3.79%</td>
<td>0.00%</td>
</tr>
<tr>
<td>Anxiety reduction (e.g., be less shy, feel less insecure)</td>
<td>3.31%</td>
<td>0.00%</td>
</tr>
<tr>
<td>Image enhancement (e.g., to be cool, to feel cool)</td>
<td>2.85%</td>
<td>0.32%</td>
</tr>
<tr>
<td>Celebration (e.g., special occasion, to celebrate)</td>
<td>1.26%</td>
<td>0.16%</td>
</tr>
<tr>
<td>Medical use (e.g., alleviate physical pain, have a headache)</td>
<td>1.26%</td>
<td>0.16%</td>
</tr>
<tr>
<td>Habit (e.g., feeling was addictive, became a habit)</td>
<td>0.99%</td>
<td>0.00%</td>
</tr>
</tbody>
</table>

Lee, Neighbors & Woods (2007)

## Withdrawal: Cannabis

### Diagnostic Criteria 292.0 (F12.288)

**A.** Cessation of cannabis use that has been heavy and prolonged (i.e., usually daily or almost daily use over a period of at least a few months).

**B.** Three (or more) of the following signs and symptoms develop within approximately 1 week after Criterion A:

1. Irritability, anger, or aggression.
2. Nervousness or anxiety.
   - Sleep difficulty (e.g., insomnia, disturbing dreams).
   - Decreased appetite or weight loss.
3. Restlessness.
4. Depressed mood.
5. At least one of the following physical symptoms causing significant discomfort:
   - abdominal pain, shakiness/shrillness, sweating, fever, chills.

**C.** The signs or symptoms in Criterion B cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.

**D.** The signs or symptoms are not attributable to another medical condition and are not better explained by another mental disorder, including intoxication or withdrawal from another substance.
Screening

- Screening suggestions
  - Cannabis Use Disorder Identification Test-Revised (CUDIT-R)

The Cannabis Use Disorder Identification Test - Revised (CUDIT-R)

<table>
<thead>
<tr>
<th>Have you used any cannabis over the past six months?</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

If you answered “Yes” to the previous question, please answer the following questions about your cannabis use. Circle the response that is most correct for you in relation to your cannabis use over the past six months.

1. How often do you use cannabis?
   - Never
   - Monthly or less
   - 2-4 times a month
   - 2-3 times a week
   - 4+ times a week

2. How many hours were you “stoned” on a typical day when you had been using cannabis?
   - Less than 1
   - 1 or 2
   - 3 or 4
   - 5 or 6
   - 7 or more

3. How often during the past 6 months did you find that you were not able to stop using cannabis once you had started?
   - Never
   - Less than monthly
   - Monthly
   - Weekly
   - Daily/almost daily

4. How often during the past 6 months did you fail to do what was normally expected from you because of using cannabis?
   - Never
   - Less than monthly
   - Monthly
   - Weekly
   - Daily or almost daily

5. How often in the past 6 months have you devoted a great deal of your time to getting, using, or recovering from cannabis?
   - Never
   - Less than monthly
   - Monthly
   - Weekly
   - Daily/almost daily

6. How often in the past 6 months have you had a problem with your memory or concentration after using cannabis?
   - Never
   - Less than monthly
   - Monthly
   - Weekly
   - Daily or almost daily

7. How often do you use cannabis in situations that could be physically hazardous, such as driving, operating machinery, or caring for children?
   - Never
   - Less than monthly
   - Monthly
   - Weekly
   - Daily/almost daily

8. Have you ever thought about cutting down, or stopping, your use of cannabis?
   - Never
   - Yes, but not in the past 6 months
   - Yes, during the past 6 months

This questionnaire was designed for self-administration and is scored by adding each of the 8 items:

- Question 1-7 are scored on a 0-4 scale
- Question 8 is scored 0, 2, or 4

Score: __________

Scores of 8 or more indicate hazardous cannabis use, while scores of 12 or more indicate a possible cannabis use disorder for which further intervention may be required.

At least in Washington, the age group that already reports the highest prevalence of cannabis use is increasing use (and use with risk of Cannabis Use Disorder) following implementation of legalization.
Past year cannabis use by age group

Percentage with past year cannabis use
- 12 to 17 year olds
- 18 to 25 year olds
- 26 years and older

Source: SAMHSA 2020 National Survey on Drug Use and Health

- Funded by Division of Behavioral Health & Recovery (DBHR):
  - Sarah Mariani
  - Sandy Salivaras

- Young Adult Health Survey Team:
  - Jason Kilmer
  - Mary Larimer
  - Isaac Rhew
  - Alice Yan
  - Rose Lyles-Riebli

Washington State Health Care Authority (Division of Behavioral Health and Recovery) (PI: Kilmer).
Young Adult Health Survey Recruitment

- Aimed to collect all Year One data before the first store opened in July 2014
  - 69.3% collected before the first store opened
  - Remaining 30.7% collected into August 2014
    - Only 18 stores had opened statewide in July
    - Only 31 stores had opened by August

Young Adult Health Survey Recruitment

- Participants recruited using a combination of direct mail advertising to a random sample from DOL, as well as online advertising (Facebook, Craigslist, Instagram, study web site, etc.)
- Assessed demographics on ongoing basis and modified strategies to recruit under-represented groups
- Convenience sample, not a random sample
Post-stratification weighting and analyses

- To improve generalizability, used post-stratification weights based on gender, race, and geographic region
- Weighted results are consistently very similar to non-weighted

Young Adult Health Survey

- Each year we collect data from a new cohort of 18-25 year olds
Sample sizes over time

- Cohort 1 (2014): 2,101
- Cohort 2 (2015): 1,675
- Cohort 3 (2016): 2,493
- Cohort 4 (2017): 2,342
- Cohort 5 (2018): 2,412
- Cohort 6 (2019): 1,942
- Cohort 7 (2020): 1,643
- Cohort 8 (2021): 1,756
- **TOTAL:** 16,364

Young Adult Health Survey

- Each year we follow up with previous cohorts
- Our 9\textsuperscript{th} year of data collection just ended at the end of 2022 (and the cohort we recruited as 18-25 year olds in 2014 is now 26-33)
- Dr. Katarina Guttmannova applied for and obtained a secondary data analysis grant (NIDA grant R01DA047996, PI: Guttmannova)
Cannabis Use Among Young Adults in Washington State After Legalization of Nonmedical Cannabis


- n=12,963 young adults in Washington over 6 time points
- Included covariates for:
  - Sex assigned at birth
  - Race
  - Ethnicity
  - Geographic region of the state
  - Age
  - Attending 4 year college
  - Full time employment status
- Computed post-stratification weights to further control for distribution across the samples
Any past year cannabis use

Kilmer, et al. (2022)
At least monthly cannabis use

![Graph showing prevalence of cannabis use over study years categorized by age (≤21 and ≥21) from 2014 to 2019.]

Kilmer, et al. (2022)

---

MaCoun (2013), Frontiers in Psychiatry

<table>
<thead>
<tr>
<th>Criterion</th>
<th>DSM-IV substance dependence</th>
<th>DSM-5 substance use disorder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tolerance</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Taken more/longer than intended</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Desire/unsuccessful efforts to quit use</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Great deal of time taken by activities involved in use</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Use despite knowledge of problems associated with use</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Important activities given up because of use</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Recurrent use resulting in a failure to fulfill important role obligations</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Recurrent use resulting in physically hazardous behavior (e.g., driving)</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Continued use despite recurrent social problems associated with use</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Craving for the substance</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>

---

DSM-5 Cannabis Use Disorder Criteria

- **Mild**: 2-3 symptoms
- **Moderate**: 4-5 symptoms
- **Severe**: 6+ symptoms

---

63

---

64

---

32
Perceived risk of cannabis use keeps decreasing

- **Cannabis**
  - Physical risk of occasional cannabis use
  - Psychological/emotional risk of occasional cannabis use
  - Physical risk of regular cannabis use
  - Psychological/emotional risk of regular cannabis use

- **Alcohol**
  - Physical risk of 2 drinks every day
  - Psychological risk of 2 drinks every day
  - Physical risk of 5+ drinks every weekend
  - Psychological risk of 5+ drinks every weekend

There are many opportunities to communicate risks associated with impaired driving

**Impaired driving and duration of effects**

- **Effects on the brain**
  - Authors of I-502 set DUI at 5 ng THC/ml of blood for those over 21 (any positive value for those under 21)
  - Why 5 ng? Similarities in impairment to .08% for alcohol
  - How long does it take to drop below 5 ng?
  - Fischer and colleagues (2022) encourages waiting at least 6-8 hours after inhaling and 8-12 hours after ingesting
More pot use found in fatal crashes, data says

Marijuana use appears to have increased as a factor in deadly crashes last year in Washington.

By Bob Young
Seattle Times reporter

Marijuana use appears to have increased as a factor in deadly crashes last year in Washington.

New data from the Washington Traffic Safety Commission shows the number of drivers involved in fatal crashes with THC in their body increased from 29 in 2013 to 75 this past year. About half those 75 drivers had active THC — the main psychoactive chemical in pot — above the level that legally determines intoxication.

Source: Seattle Times, August 20, 2015

Drugged driving eclipses drunken driving in tests of motorists killed in crashes

For the first time, statistics show that drivers killed in crashes are more likely to be on drugs than drunk.

Forty-three percent of drivers tested in fatal crashes in 2013 had used a legal or illegal drug, eclipsing the 37 percent who tested above the legal limit for alcohol.

Figure 1. Estimated Percentage of Drivers Involved in Fatal Crashes Who Were THC-Positive, Washington State, 2008-2017.

Vertical bars represent 95% Confidence Intervals.


How Can We Use This Information to Prevent & Reduce Harm from Marijuana?

- **Correct Normative Misperceptions**
  - Most people are not using
  - Most people are not driving under the influence
  - The more people use, the more they think others are using
  - Opportunity for positive community norms (e.g., Jeff Linkenbach’s Montana Institute)
68% of young adults in King County did not use marijuana in the past month.

Mike Graham-Squire & Neighborhood House: MostSteerClear

87% of young adults do not drive after marijuana use. Impairment can last at least 4-8 hours.

Mike Graham-Squire & Neighborhood House: MostSteerClear
There are also opportunities to discuss cannabis and birth outcomes.

• Significant differences in:
  • 1) head circumference (marker of brain development, and smaller head circumference associated with cognitive impairment)
     ▫ Co-use group had a 5.7 times greater odds of having a small head circumference than no-use group
  • 2) occurrence of birth defects
     ▫ Co-use group had a 3 times greater odds of having birth defects than no-use group
  • 3) stillbirth/miscarriage
     ▫ Cannabis only group had 12 times greater odds of a stillbirth or miscarriage compared to the no-use group

Table 2  Newborn outcomes by in utero marijuana exposure status.

<table>
<thead>
<tr>
<th></th>
<th>Non-marijuana exposed (n = 531)</th>
<th>Marijuana exposed (n = 531)</th>
<th>OR or difference</th>
<th>χ²</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth weight (g) (mean ± SD)</td>
<td>3092 ± 580</td>
<td>2874 ± 665</td>
<td>218 g</td>
<td>5.68</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Low birth weight (% &lt;2500 g)</td>
<td>11.5%</td>
<td>20.9%</td>
<td>1.82</td>
<td>17.46</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Gestational age (week) (mean ± SD)</td>
<td>38.8 ± 2.2</td>
<td>38.1 ± 3.1</td>
<td>0.6 week</td>
<td>3.89</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Preterm delivery (% &lt;37 week)</td>
<td>10.1%</td>
<td>18.1%</td>
<td>1.79</td>
<td>13.88</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Apgar score 1 min (mean ± SD)</td>
<td>7.8 ± 1.4</td>
<td>7.5 ± 1.8</td>
<td>0.3</td>
<td>2.24</td>
<td>0.026</td>
</tr>
<tr>
<td>Apgar score 5 min (mean ± SD)</td>
<td>8.8 ± 0.8</td>
<td>8.6 ± 1.4</td>
<td>0.2</td>
<td>2.90</td>
<td>0.004</td>
</tr>
<tr>
<td>NICU admission (% yes)</td>
<td>9.5%</td>
<td>13.6%</td>
<td>1.43</td>
<td>4.03</td>
<td>0.045</td>
</tr>
</tbody>
</table>

Groups matched on: delivery year (±1), delivery hospital (exact), maternal age (±1 year), maternal marital status (married, single), race (white, minority), parity (0, 1, 2+), medical insurance (public, private), pregnancy smoking (yes, no), alcohol use (yes, no), benzodiazepine use (yes, no), opioid use (yes, no).

*OR = Odds Ratio reflecting increased risk of the outcome for the marijuana-exposed group compared with the non-marijuana-exposed group for low birth weight, preterm delivery, cesarean delivery, and NICU admission. Differences in mean outcomes are given for birth weight, gestational age, and Apgar scores at 1 and 5 min.

“In the current study, marijuana exposure in utero independently predicted poorer birth outcomes across the board, especially indicators such as birth weight and preterm birth that are known to impact longer-term health and development. Effects could not be attributed to other comorbidities including other drug exposure and sociodemographic risks in this study that involved rigorous matching and biochemical verification of self-report of marijuana and other drug use...Consequently, women should continue to be encouraged to avoid marijuana use during pregnancy (p. 5 of 6) (Bailey, Wood, & Shah, 2020)”

Recommendations addressing both of these previous sections are in the Fischer et al (2022) lower risk guidelines article
Lower-Risk Cannabis Use Guidelines (LRCUG) for reducing health harms from non-medical cannabis use: A comprehensive evidence and recommendations update

Benedikt Fischer, Tessa Robinson, Chris Bullen, Valerie Curran, Didier Jutras-Aswad, Maria Elena Medina-Mora, Rosalie Liccardo Pacula, Jürgen Rehm, Robin Room, Wim van den Brink, Wayne Hall

Published in January 2022 issue of International Journal of Drug Policy

General Precaution A:

“There is no universally safe level of cannabis use; thus, the only reliable way to avoid any risk for harm from using cannabis is to abstain from its use.”
Among other recommendations:

- People who use cannabis should use low potency cannabis products
- “Overall, there is no categorically ‘safe’ route of use for cannabis and each route option brings some level of distinct risks that needs to be taken into account for use. “ That said, smoking is particularly risky.
- Keep use occasional (no more than 1 or 2 days a week, weekend only)
- If a person notices impacts to attention, concentration, or memory, “consider temporarily suspending or substantially reducing the intensity (e.g., frequency/potency) of their cannabis use.”
- Avoid driving while under the influence (waiting at least 6-8 hours after inhaling, 8-12 hours after use of edibles)

Recommendation #9: It is prudent for people who intend to procreate and for women who are pregnant or breastfeeding to abstain from cannabis use towards reducing possible risks for reproduction and of health harm to offspring, respectively. There is some evidence that especially intensive cannabis use may somewhat compromise reproductive abilities for women and men. Cannabis use, especially during pregnancy, may adversely affect some pre- and post-natal health outcomes in offspring. Cannabinoids may also be passed on to infants via breastfeeding. The magnitude of any of these adverse effects from these exposures on conception, the fetus or infant development is likely small but it is generally prudent for those intending to reproduce, and for women who are pregnant or breastfeeding, to abstain from cannabis use during these particular periods of risk.

Fischer, et al. (2022)
Recommendation #11: Some specific groups of people are at elevated risk for cannabis use-related health problems because of biological pre-dispositions or co-morbidities. They should accordingly (and possibly on medical advice as required) avoid or adjust their cannabis use. Higher risks for harm extend to individuals with a genetic predisposition (e.g., a first-degree family or personal history) for, or an active psychosis, mood (e.g., depressive) disorder, or substance use disorder.

Lessons learned:
Be aware of things that can contribute to perceived norms, including media
Media


Potential role of media

- Impact of media exposure related to alcohol (including television, advertisements, and movie content)
  - In a review of 13 studies, 12 of the 13 showed media exposure was associated with increased likelihood of:
    - Initiating drinking among abstainers
    - Increased consumption among those already drinking

Scribner et al (2011) found:
- No overall effect of a social norms campaign on 32 college campuses, but...
  - Campaign DID work on campuses with a lower alcohol outlet density
- "Neon signs, storefront advertising, and direct observation of heavy drinking may convey their own normative message to students, thereby heightening student misperceptions of peer drinking norms" (page 238).
Examining role of parents and peers

- Fairlie, Wood, & Laird (2012) collected data during summer before starting college, 10 month follow-up (spring semester of first year), and 22 month follow-up (spring semester of second year)
- Looked at social modeling (e.g., # of close friends who drink heavily, perceived friend approval of drinking and getting drunk) and parental permissiveness

Heavy episodic drinking as a function of high or low social modeling + high or low parental permissiveness
Relationship between Marijuana Use and Perceived Parental and Community Norms, Grade 10, 2016

- Statewide, 10th graders are less likely to use marijuana if they believe their parents think it is wrong for them to use.
- Statewide, 10th graders are less likely to use marijuana if they believe their community thinks it is wrong for them to use.

Source: Healthy Youth Survey, 2016

WHERE DO PEOPLE GET MARIJUANA, 18-20 year olds

<table>
<thead>
<tr>
<th>Source</th>
<th>Cohort 1</th>
<th>Cohort 2</th>
<th>Cohort 3</th>
<th>Cohort 4</th>
<th>Cohort 5</th>
<th>Cohort 6</th>
<th>Cohort 7</th>
<th>Cohort 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>From friends</td>
<td>77.8%</td>
<td>76.7%</td>
<td>80.4%</td>
<td>77.4%</td>
<td>84.7%</td>
<td>86.7%</td>
<td>86.8%</td>
<td>86.8%</td>
</tr>
<tr>
<td>Gave money to someone</td>
<td>22.3%</td>
<td>26.4%</td>
<td>34.7%</td>
<td>41.5%</td>
<td>39.2%</td>
<td>43.1%</td>
<td>40.5%</td>
<td>39.3%</td>
</tr>
<tr>
<td>Got it from someone w/ medical mj card</td>
<td>17.5%</td>
<td>14.1%</td>
<td>4.3%</td>
<td>5.2%</td>
<td>2.7%</td>
<td>2.8%</td>
<td>4.2%</td>
<td>4.6%</td>
</tr>
<tr>
<td>Got it from a dispensary</td>
<td>6.5%</td>
<td>18.9%</td>
<td>5.8%</td>
<td>4.7%</td>
<td>6.5%</td>
<td>8.2%</td>
<td>8.4%</td>
<td>12.0%</td>
</tr>
<tr>
<td>Got it at a party</td>
<td>22.9%</td>
<td>22.1%</td>
<td>23.0%</td>
<td>24.9%</td>
<td>26.1%</td>
<td>22.9%</td>
<td>8.8%</td>
<td>24.7%</td>
</tr>
<tr>
<td>Got it from family</td>
<td>5.6%</td>
<td>5.1%</td>
<td>11.7%</td>
<td>9.7%</td>
<td>11.2%</td>
<td>10.9%</td>
<td>13.4%</td>
<td>7.0%</td>
</tr>
<tr>
<td>Got it from other way</td>
<td>11.6%</td>
<td>4.1%</td>
<td>6.1%</td>
<td>5.0%</td>
<td>7.3%</td>
<td>6.2%</td>
<td>5.0%</td>
<td>6.2%</td>
</tr>
<tr>
<td>Bought from retail store</td>
<td>9.0%</td>
<td>4.6%</td>
<td>1.7%</td>
<td>1.9%</td>
<td>2.0%</td>
<td>3.5%</td>
<td>1.5%</td>
<td>1.0%</td>
</tr>
<tr>
<td>Got it from parents w/ permission</td>
<td>5.7%</td>
<td>5.0%</td>
<td>12.3%</td>
<td>10.4%</td>
<td>11.0%</td>
<td>12.9%</td>
<td>13.0%</td>
<td>13.9%</td>
</tr>
<tr>
<td>Grew it themselves</td>
<td>1.3%</td>
<td>1.3%</td>
<td>1.6%</td>
<td>0.2%</td>
<td>1.4%</td>
<td>2.7%</td>
<td>1.6%</td>
<td>0.4%</td>
</tr>
<tr>
<td>Stole it from store/Dispensary</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>4.1%</td>
<td>2.4%</td>
<td></td>
</tr>
</tbody>
</table>

For 18-20 year olds...

- **Decreasing**
  - Getting it from friends
  - Giving money to someone
- **Increasing**
  - Getting it from parents with permission
  - Stole it from a store/Dispensary are increasing

Source: Young Adult Health Survey, Kilmer (PI)
Available in 37 languages at StartTalkingNow.org

https://www.learnaboutcannabiswa.org/parents/

A parent’s guide to preventing underage marijuana use
As a parent, what should I do?

The guidance that might be most useful for you differs by the level of involvement with cannabis. How would you describe your grown child’s cannabis use?

Click on one of the buttons below for discussion points and examples of what to say.

- I’m not sure if my child is using cannabis
  Click for suggestions ▼

- My child uses cannabis, but I’m not sure how much or how often
  Click for suggestions ▼

- My child uses cannabis regularly
  Click for suggestions ▼
http://www.collegeparentsmatter.org

1) Don’t be afraid to start the conversation
2) As a family member, you are allowed to disapprove of substance use. Give yourself permission to disapprove.
3) Banish any fear that your disapproval is naïve.
4) Focus on one message during the conversation.
5) Reject the myth that discouraging substance use is useless because everyone is doing it.
6) Make communication a regular activity.
7) Recognize the power of your influence.

Opportunities for Prevention Professionals
(1) Consider SBIRT

- **Screening**: Universal screening for quickly assessing use/severity/risks
- **Brief Intervention**: Motivational/awareness-raising intervention to prompt contemplation of or commitment to change
- **Referral to Treatment**: Referral to specialty care or follow-ups
In-person, personalized feedback interventions have shown reductions in use, time spent high, and consequences (e.g., Lee, et al., 2013)


(2) Consider event-specific prevention and/or enforcement, particularly if it’s an event where there will be driving
High-risk events

Is 4/20 an Event-Specific Marijuana Holiday? A Daily Diary Investigation of Marijuana Use and Consequences Among College Students

ADRIAN J. BRAVO, M.D.,* MATTHEW R. PEARSON, M.D.,† BRADLEY T. CONNER, M.D.,‡ & JAMIE E. PARNES, M.D.,§

*Center on Alcoholism, Substance Abuse, & Addictions, University of New Mexico, Albuquerque, New Mexico
†Department of Psychology, Colorado State University, Fort Collins, Colorado
‡University of Virginia, Charlottesville, Virginia
§University of Colorado School of Medicine, Denver, Colorado

ABSTRACT: Objective: Given the popular association between April 20 ("4/20") and marijuana, this study examined marijuana use and consequences on 4/20 compared with other days in order to test whether 4/20 is a high-risk, event-specific marijuana holiday among college student marijuana users. Method: Fifty-nine college student marijuana users from three different, large universities in Virginia, New Mexico, and Colorado completed daily brief surveys (70 minutes) over a 12-day (April 13–April 26) period assessing prior-day marijuana use (i.e., percentage of days who consumed marijuana, number of unique marijuana-use sessions, subjective high/intoxication while under the influence of marijuana, and number of grams of marijuana consumed) and marijuana-related consequences. Results: Using univariate repeated-measures analyses of variance, we found that (1) 79.0% of students reported using marijuana on 4/20, which was significantly more than weekdays (61.9%) and weekends (72.7%); (2) students reported a significantly higher number of unique marijuana use sessions on 4/20 (M = 3.47) compared with weekend days (M = 1.47) and weekdays (M = 1.56) and (3) students reported a significantly higher number of grams consumed on 4/20 (M = 0.76) compared with weekends (M = 0.33) and weekdays (M = 0.63). Conclusions: Our study provides preliminary support that 4/20 is a day associated with increased marijuana use but provides little evidence for an association with more problematic use. (J Stud Alcohol Drugs. 2017;78:134–139, 2017)

Rates of marijuana use and cannabis use disorder peak during traditional college years (ages 18–25 years) in the United States (Farmer et al., 2015). In a recent study across 11 different U.S. universities, Pearson and colleagues (in press-a) found that between 15.5% and 38.7% (M = 24.9%) ofcollege students report casual marijuana use in this context.

Vanderveer, 2014 host 4/20 gathering events to celebrate that day. However, little research has examined whether marijuana users “choose to celebrate 4/20 as a special event or treat it as simply another day to consume marijuana” (Quailey, 2016). Common perception suggests that marijuana users smoke marijuana increased use and consumption.

The April 20 Cannabis Celebration and Fatal Traffic Crashes in the United States

John A. Staples, MD, MPH, Donald A. Redelmeier, MD, MHS, PhD, and Anthony D. Giangola, MD

The April 20 Cannabis Celebration and Fatal Traffic Crashes in the United States

April 2018

The April 20 Cannabis Celebration and Fatal Traffic Crashes in the United States

John A. Staples, MD, MPH, Donald A. Redelmeier, MD, MHS, PhD, and Anthony D. Giangola, MD

April 20 each year, thousands of Americans celebrate the intoxicating properties of marijuana on a popular counterculture holiday known as “4/20.” Legal marijuana sales surge in anticipation of the “High Holiday,” and college students report increased cannabis consumption on 4/20 itself.1,2 In many cities,

Staples & Redelmeier (2018)

• Obtained data from US NHTSA’s Fatality Analysis Reporting System
• From 1992 through 2016, between 4:20 p.m. and 11:59 p.m. on April 20 compared to same interval on April 13 and April 27
• The risk of a fatal crash was significantly higher on April 20 (relative risk 1.12, p<.001)
(3) Correct misperceived norms

• Correct Normative Misperceptions
  ▫ Most people are not using
  ▫ Most people are not driving under the influence
  ▫ The more people use, the more they think others are using
    • Personalized normative feedback
    • Personalized feedback interventions
    • Social norms campaigns
(4) Bring in the science on medical cannabis use (particularly if people are declining referrals for counseling or health consultations)

Doctors should think twice before prescribing medical marijuana: guideline

New guideline warns pain benefits of medical cannabis overstated
University of Alberta led guideline warns health risks may outweigh benefits, provides guidance on when (and when not to) prescribe.

Canadian Doctors Warn Medical Pot Is Overhyped

Source: Gizmodo.com

Source: ScienceDaily.com

Simplified guideline for prescribing medical cannabinoids in primary care

Objective To develop a decisional algorithm for a straightforward approach to medical cannabis use.

Figure 1. Clinical cannabinoid prescribing algorithm

Only are recommending for neuropathic pain, palliative and end-of-life pain, chemotherapy-induced nausea and vomiting, and spasticity due to multiple sclerosis or spinal cord injury...

AND

If tried traditional therapies/treatments first...

Allan, et al. (2018)
Cannabidiol Does Not Dampen Responses to Emotional Stimuli in Healthy Adults

David L. Arndt and Horatio de Wit

Abstract

Introduction: Cannabidiol (CBD) is a nonpsychotomimetic constituent of whole plant cannabis that has been reported to reduce anxiety-like behaviors in both preclinical and human laboratory studies. However, controlled clinical studies have demonstrated its ability to reduce negative events by dampening responses to negative emotional stimuli in humans. The objective of this study was to investigate the effects of CBD on responses to negative emotional stimuli, as a model for its potential anxiety-reducing effects.

Materials and Methods: The study used a double-blind, placebo (PBO)-controlled, within-subjects design in which 18 healthy, drug-free participants consumed CBD (0, 300, and 900 mg) or PBO before completing several behavioral tasks related to anxiety-relevant sensory stimuli. Dependent measures included emotional arousal to negative and positive visual stimuli, perceptual sensitivity to emotional facial expressions, attention bias toward emotional facial expressions, and feelings of social rejection. In addition, subjective drug effects and

“This study suggests that oral CBD does not alter responses to emotional stimuli, or produce anxiolytic-like effects in healthy human subjects. (p. 112)”

Arndt & de Wit (2017)

Effect of Medical Marijuana Card Ownership on Pain, Insomnia, and Affective Disorder Symptoms in Adults: A Randomized Clinical Trial

Jodi M. Gilman, PhD, Randi L. Zutter, PhD, Kevin W. Potter, PhD, William Smith, BA, Grace Wheeler, BA, Gladiys N. Parros, MD, Sarah Hickey, BSN, Megan E. Cooke, PhD, Alyson Daxler, BA, Rachel Mennemeier, BA, Brendan Tero-Clemmons, PHD, David A. Schoenfeld, Ph.D, A. Eden Evins, MD, MPH

Abstract

Importance: Despite the legalization and widespread use of cannabis products for a variety of medical concerns in the US, there is not yet a strong clinical literature to support such use. The risks and benefits of obtaining a medical marijuana card for common clinical outcomes are largely unknown.

Objective: To evaluate the effect of obtaining a medical marijuana card on target clinical and cannabis use disorder (CUD) symptoms in adults with a chief concern of chronic pain, insomnia, or anxiety or depressive symptoms.

Design, Setting, and Participants: This pragmatic, single-site, single-blind randomized clinical trial was conducted in the Greater Boston area from July 1, 2017, to July 18, 2019. Participants

Key Points

Question: What are the risks and benefits of obtaining a medical marijuana card for adults who seek medical marijuana for pain, insomnia, and anxiety or depressive symptoms?

Findings: In this randomized clinical trial involving 186 participants, immediate acquisition of a medical marijuana card increased the incidence and severity of cannabis use disorder (CUD) and resulted in no significant improvement

Gilman, et al. (2022) (released 3/18/2022)
**A** Frequency of cannabis use in immediate card acquisition group vs delayed card acquisition group

![Graph showing frequency of cannabis use over time for immediate and delayed card acquisition groups.](image)

<table>
<thead>
<tr>
<th>No. at risk</th>
<th>Immediate card acquisition group</th>
<th>Delayed card acquisition group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baseline</td>
<td>wk 2</td>
</tr>
<tr>
<td>Immediate</td>
<td>105</td>
<td>101</td>
</tr>
<tr>
<td>Delayed</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Gilman, et al. (2022) (released 3/18/2022)

**B** Incidence of CUD by randomization group and primary complaint

![Bar chart showing incidence of CUD for immediate and delayed card acquisition groups.](image)

- Pain
- Insomnia
- Depression/anxiety

<table>
<thead>
<tr>
<th>Participants with CUD, %</th>
<th>Immediate card acquisition group</th>
<th>Delayed card acquisition group</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 wk</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>4 wk</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>12 wk</td>
<td>15</td>
<td>10</td>
</tr>
</tbody>
</table>

Gilman, et al. (2022) (released 3/18/2022)
Figure 3. Effect Sizes for Primary, Secondary, and Exploratory Outcomes

<table>
<thead>
<tr>
<th>Source</th>
<th>Cohen d effect size (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CUD symptoms</td>
<td>1.02 (0.57 to 1.55)</td>
</tr>
<tr>
<td>Pain severity</td>
<td>-0.02 (-0.39 to 0.38)</td>
</tr>
<tr>
<td>Insomnia</td>
<td>0.79 (0.43 to 1.30)</td>
</tr>
<tr>
<td>Depression</td>
<td>0.12 (-0.11 to 0.36)</td>
</tr>
<tr>
<td>Anxiety</td>
<td>0.02 (-0.24 to 0.30)</td>
</tr>
</tbody>
</table>

“There were no observed benefits of obtaining a medical marijuana card for pain, anxiety, or depressive symptoms. (p. 11)”

Gilman, et al. (2022) (released 3/18/2022)

- Those with affective disorders have 3.9 higher odds of meeting criteria for Cannabis Use Disorder
- “These data suggest that a medical marijuana card may pose a high risk or may even be contraindicated for people with affective disorders. This finding is important to replicate because depression has been reported as the third most common reason that people seek a medical marijuana card.” (page 10)

Gilman, et al. (2022) (released 3/18/2022)
(5) Keep collaborating – communities that get people on the same page as far a plan for prevention are the ones seeing successes

Collaborating

- Explore ways to put science in people’s hands
  - Parent meetings
  - Town hall meetings
  - Peer educators
  - SBIRT
- Work with colleges, universities, researchers, scientists (and so many other potential sources) to help translate findings to communities
Some of the most effective strategies are carried out in the communities and states surrounding the campuses, such as enforcing the minimum legal drinking age. Campus leaders can be influential in bringing about off-campus environmental changes that protect students.

To achieve success off campus, partner with leaders and coalitions in your community and state. Building these partnerships takes time, so you may want to make it part of a long-term plan. For models of campus-community collaboration, see the Frequently Asked Questions section of the CollegeAIM website (see URL below).

CollegeAIM, page 6

(6) Put science in people’s hands
“Without data, you’re just another person with an opinion...”

W. Edwards Deming

“Without data, all we have are opinions...”

Data matter, and all data tell a story
So, how do we translate findings to the real world?

Tell the story. Make the findings digestible and clear (without being too simplistic), and provide all citations/references to boost legitimacy/credibility.

- Special thank you to:
  - Aisha Hamid
  - Conor Burke
  - Agnes Skowron
  - Scott Gagnon

Jason Kilmer – jkilmer@uw.edu

@cshrb_uw